



EV vision for man on a mission

Ira Munn has a vision – to produce a low-cost kitset electric car for one in New Zealand and market it globally. He's well on the road to producing the Drop, named because of its tear-drop aerodynamic shape.

The car body will come from a 3D printer, which is under development. Recycled plastic soft-drink bottles will be used with a hardener additive.

Munn had hoped the 3D printer might be ready for this month's evworld NZ expo in Auckland.

But more investment in the project is needed first. Munn was at the first day of the evworld expo on September 8 then flew off to Frankfurt the same evening.

He'd been selected as a finalist in the Next Visionaries programme at the IAA Cars 2017 Frankfurt auto show from September 8-13.

He was to talk about his project in a TED Talk, a partner with BMW i in the Next Visionaries, a global initiative to engage innovators, change-makers, dreamers and future thinkers to reimagine the future of mobility.



Ira Munn

TED (Technology, Entertainment and Design) is a non-profit foundation devoted to spreading ideas worldwide through talks of under 18 minutes.

If Munn wins the Frankfurt round he'll be off to New York in November for the next.

He's originally from Los Angeles and moved to Auckland with wife Shirelle two years ago.

Why New Zealand? Because we have less of a connection to the oil industry than the United States, and the Munns like Kiwi attitudes and our strong renewable energy resources.

They also saw a better chance of their project proceeding here.

So how did the Drop idea come about? After graduating from college with a sociology degree, Munn developed an aviation interest and worked on a kit plane with two "pusher" electric engines, angelically dubbed the Seraph.

While talking about his entry in the Comparative Aircraft Flight Efficiency (CAFÉ) Green Flight Challenge in California, he met American aerospace engineer and inventor **Douglas Malewicki** who had built a "California Commuter"

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First evworld NZ a success

About 2630 people learned more about the electric vehicle world at the evworld NZ expo in Auckland.

A trade day and conference on September 8 at the Vodafone Events Centre in

Manukau was followed by a free public open day on September 9.

The big turnout in wintry weather delighted event organiser Conferenz.

"We're stoked," its sponsorship general manager **Dominic Duncan** says.

"We have proven that the industry and the wider public were ready for a major dedicated annual big show for all things EV.

"Demand was overwhelming and we were crowded all the time. Feedback is amazing and we can't wait for next year!"

About 820 EV rides and drives were taken up across both days and visitors also got to try electric bikes

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Peter Harrop

INSIDE

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EVtalk

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EV champions recognised

The electric vehicle community has honoured some of its top proponents.

Five awards were handed out at the first ever evworld Champion Awards, held at the Vodafone Events Centre in Manukau, Auckland.

It was run in conjunction with electric vehicle event evworld, which was held over two days earlier this month.

EV volunteer **Mark Nixon** won the night's top award, picking up the title of EV Champion.

He was recognised for his efforts promoting electric vehicles, including organising test drives, media opportunities and his involvement in events like EVelocity and Leading The Charge.

Nixon thanked his wife for "bringing home the bacon", which allows him to follow his EV passion.

He also thanked members of the Christchurch EV Group, who share his passion for the vehicles.

Mercury chief executive **Fraser Whineray** was also given a Highly Commended award in the EV Champion section, for his work promoting EVs at a corporate level.

Meanwhile, specialist EV rental company Blue Cars won the SME EV Champion of the Year award for suc-



Award winners, from left, GVI Electric's Hayden Johnston, Waste Management's Tom Nickels, Blue Cars' Carl Barlev, EV volunteer Mark Nixon and Christchurch City Council's Kevin Crutchley.

cessfully running a purely electric fleet of rental vehicles in cities throughout the country.

Christchurch City Council picked up the Most EV Friendly Town of the Year after working on a number of initiatives, including signing up to the Yoogo EV car-sharing programme,

The small Otago town of Hampden received a Highly Commended award in the Most EV Friendly Town category, for

its commitment to the vehicles, which includes running a community EV.

Waste Management won Fleet Champion of the Year after announcing a plan to convert its diesel truck fleet to electric, while GVI Electric was awarded the EV Sector Sales and Service Champion prize.

North Shore-based Volt Vehicles received a Highly Commended Award in the EV Sector Sales and Service section. ■

First evworld NZ a success

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and e-scooters on a closed circuit.

More than 60 trade displays and sponsors featured at New Zealand's first combined EV industry and public showcase event, a large number relating to e-bikes.

EVtalk's stand, featuring Scoozzi e-scooters, foldable HaloCity e-bikes and a tiny Renault Twizy car, proved popular with about 600 visitors entering a lucky draw for the e-scooter and e-bike prizes.

Some 595 people took advantage of free public seminars on September 9.

The previous day's industry conference was well attended with 222 people sitting in on talks and panel

discussions around the EV opportunity and challenges.

"Be ready for a sudden tipping point," international keynote speaker **Peter Harrop** of IDTechEx told a packed conference opening.

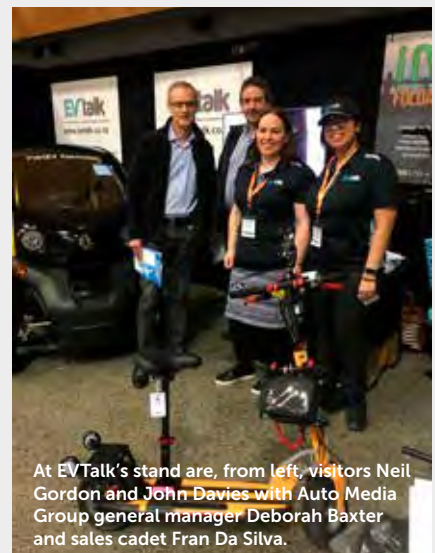
Expanding on the topic "the global outlook for the EVolution", Harrop urged conference visitors to be prepared.

"EVs will profoundly change the world within the next 20 years."

Using the smartphone as an example, Harrop says such technology is initially expensive but everyone usually gets one and prices drop.

The changes will affect not just

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At EVtalk's stand are, from left, visitors Neil Gordon and John Davies with Auto Media Group general manager Deborah Baxter and sales cadet Fran Da Silva.

First eworld NZ a success

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bikes, cars, buses and heavy trucks and machinery either. Aviation and shipping are other key transport modes changing.



Electric vehicles and charging devices were all on show at eworld NZ.

vide autonomous, multiple-passenger forms of e-mobility, he says.

He predicts the beginning of the end to the ICE age – at least for most auto production – at around 2026-30.

By 2050 many auto leaders will have vanished, EV software and services will provide a bigger market than EV hardware – the EV value market will have increased about seven times to \$1.5 billion by 2028 – energy harvesting or regeneration will be a bigger market than batteries and societal changes

“People get the message EVs are environmentally friendly and about half get the message that EVs are cheaper to run than conventional cars.”

With groups like ChargeNet NZ involved, charging infrastructure is rapidly being established, Yeaman says.

“State Highway 1 will soon be covered the length of the country.”

EV fans can encourage others to test drive an EV or to try renting or car-sharing one, she says.

Vector group chief executive **Simon Mackenzie** explained how EVs would work with electricity networks, saying owners could even use their EVs to contribute to the grid.

But there’s a need to ensure owners don’t create heavy demand by all plugging in at the same time at night.

With climate change, having EVs contribute to power supply could be

Pure electric is the way the world’s going, Harrop says, and he reckons hybrids will eventually come to an end too.

“Forget fuel cell vehicles – using power to make hydrogen to generate electricity is pointless.”

Many EVs will be powered by solar, wind or some other energy source, becoming energy independent vehicles (EIVs), he says.

That, along with increased EV range, will probably avoid the need for a proliferation of charging stations, Harrop says.

EVs are likely reach the 500km range in a few years so most people would just charge their vehicles at source – their home, he believes. Many EVs won’t need a charging station at all.

Warning of the coming impact of EVs on society, Harrop says conventional vehicle sales will collapse, gas stations will close and a wide range of industries will be affected.

“EVs will change the world.”

Pointing to eventual diesel use limitation in major cities worldwide, Harrop says people won’t want to buy a vehicle they cannot use in some places.

Rapidly growing technology will end range anxiety and pro-

will result.

Harrop says of the global EVolution: “It is happening.”

Energy Efficiency and Conservation Authority transport general manager **Elizabeth Yeaman** spoke about changes in transport being promoted through its low emission vehicles contestable fund, including Foodstuffs’ 28 e-van fleet, Wellington’s electric buses and Waste Management’s e-trucks.



Ubco’s off-road electric motorbikes were a big attraction.

useful in dry times when hydro lakes are low, Mackenzie says.

He also talked about recycling batteries and having a trailer of recycled EV batteries which could store power and be used as a generator.

Incentives could be provided to get people not to use power at peak times, with apps telling people the best times to plug in.

Political panels and an OEM/distributor panel talked about policies and opportunities.

After the success of the inaugural eworld event, it’s certain another expo will be held next year. ■



EECA’s Elizabeth Yeaman explains how it’s helping with EV projects.

Plenty of scope for autonomous trials

New Zealand-based autonomous driving trials might be in their infancy, but long-term the technology has the potential to change how we use transport, including a shake-up of the vehicle ownership model.

HMI Technologies Ltd has partnered with Christchurch International Airport to test a Navya Arma electric shuttle on private airport roads. And Volvo New Zealand put on an autonomous display at the New Zealand Traffic Institute conference last year in Tauranga with its XC-90.

Transport minister **Simon Bridges** says there's more scope to expand on the technology being tested here.

"I've got no doubt the future is connected, autonomous, shared and electric," he says.

"We will have to deal with that, whether we're practically ready or not."

Autonomous technology might not be the norm for the next ten years or more but Bridges says it will "radically change the way we

get around".

"What it means in a real sense is it's going to be about congestion, which is a massive political issue and practical issue, particularly in Auckland and other high growth areas of

Disruption



Simon Bridges



Dave Verma



Coby Duggan

New Zealand."

It also has implications for the vehicle ownership model, with fewer people likely to buy cars because they won't have to, he says.

"With young people, all they want to own is a smartphone. [With autonomous vehicles] they can order a car and take it where they want."

If the Government is re-elected in this month's election, Bridges says he won't be giving up on the autonomous test bed idea.

"If I keep the portfolios I will get back over to Silicon Valley and Israel and work to bring more technology and trials to New Zealand."

Success in similar fields, such as Rocket Lab launching rockets off the Mahia Peninsula, shows it can be done, he says.

"With the Rocket Lab launch we're finally being recognised as somewhere that's not just about sheep and The Hobbit."

A mix of tech-savvy people and a varied landscape makes New Zealand an appealing place to test autonomous vehicles, Bridges says.

"Our competitive advantage is pretty simple. It's interesting geography and a lot of clear space. You can go from sun to snow in a short space of time."

HMI Technologies new initiatives director **Dave Verma** says the trial at Christchurch Airport covers many bases.

"The objective for both HMI and Christchurch International Airport is to develop a complete understanding of all the elements involved in the autonomous vehicle space - their use, operations and associated infrastructure requirements."

The airport trial could eventually lead to an autonomous vehicle shuttle service taking passengers a short distance from the terminal to

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Disruption

The automotive industry is undergoing a massive and ever quickening transformation.

Some say it will see more change in the next five to ten years than in the past 50.

So what are the five key disruptive factors facing the industry.

- 1. The impact of EVs.** Be prepared for change – big change. Electrification ranges from all-electric to hybrids. Dealerships are being warned to adapt. Will direct selling, like Tesla, have much impact?
- 2. Mobility as a service:** Seen as the biggest disruptor to business models rather than new technology. City dwellers especially won't need to own a car, leasing one or using various ride or car-sharing services instead.
- 3. Intelligent systems:** Involving all sorts of new technology for vehicles. Some of it, like pedestrian collision warning systems, are in new vehicles now. Others could include under-road charging for EVs or using mobile robots (drones and ground-based) for deliveries and factory work.
- 4. Driverless vehicles and autonomous public transport:** Most are in the trial stages but expect big developments soon.
- 5. Connected journeys:** Modes of transport vary according to customer needs. Could range from public transport and services like Uber to electric scooters or e-bikes. ■



Pure power behind car-sharing coup

Car-sharing is going fully electric in Christchurch.

Kiwi fleet management company Yoogo will soon have 100 battery electric vehicles (EVs) on offer after being selected by the Christchurch City Council to implement the service.

Yoogo will initially launch 70 EVs

across three city hubs in late November, with another 30 to follow in February across nine locations in total.

It's one of the largest transitions from combustion engines to pure shared electric vehicles in the Southern Hemisphere, putting Christchurch among the few cities worldwide to offer an all-electric shared fleet service.

Canterbury organisations and residents will have access to the fleet pool.

Yoogo's electric car-sharing model will break down barriers around cost and charging infrastructure, making all-electric EVs accessible and affordable, company general manager **Kirsten Corson** says.

"The pure electric car-sharing platform is a smart and sustainable way to get around town for businesses and everyday Kiwis," she says.

"Yoogo will deliver an experience that is easy, enjoyable and affordable.

"Cantabrians will pay for the time they use the car and Yoogo takes care of everything else. Users can simply

book online and access vehicles via the Yoogo app or swipe card."

The initiative is the result of leading public and private sector organisations partnering over a shared vision for an efficient and sustainable transport solution.

a transport service with zero tailpipe emissions will improve air quality and have positive health benefits for the residents of Christchurch."

Yoogo will open hubs at the airport, reborn suburb West End and the

Christchurch Art Gallery using an A-to-A model. All the other hubs will be open by the end of March.

Next year Yoogo will move to an A-to-B model, which means a vehicle can be dropped off at a different Yoogo hub.

Initial phase one hubs around the city will include the West End, Lichfield St, The Crossing and art gallery car parks, Ara Institute,

Canterbury University, Papanui and Fendalton libraries, Lyttelton Community Centre and Christchurch Airport.

Pure EVs at these hubs will include Hyundai Ioniq and BMWi3 vehicles.

Yoogo was founded in 2014 as innovators in the fleet management and vehicle leasing market.

With complimentary GPS and telematics in every vehicle, it soon became clear that many businesses had a lot of cars sitting in carparks each day.

The company is a strong promoter of EVs so when it started the car-sharing model in 2015, it says it made sense to adopt an all-electric platform.

Go to www.yoogo.co.nz for more information. ■



Yoogo's Kirsten Corson, left, and Christchurch mayor Lianne Dalziel.

The service will be launched for the council, Ara Institute, Aurecon, Beca, Canterbury District Health Board, Chapman Tripp, Environment Canterbury, Meridian Energy, Tonkin and Taylor and Warren and Mahoney, Jacobs, and Christchurch Airport, as well as for the general public.

"This is an exciting development for Christchurch to have a new innovative 100% battery electric transport service," council resources efficiency manager and the scheme's project manager **Kevin Crutchley** says.

"New Zealand's electricity is mostly generated from renewable energy so this electric vehicle offering will reduce our city's carbon emissions. And using

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An EV love affair on screen

A Dunedin couple have become so enthralled with electric vehicles they're documenting the New Zealand EVolution as a "labour of love".

Paul and Oana Jones are using their film and video expertise to produce *Charged As*, their work featuring on YouTube covering various aspects of EV progress.

Paul is a visual effects artist and animator and Oana a producer for the Otago Museum planetarium and a 3D artist.

They've joined with photographer/television producer **Michael Henriquez** and composer **Luis Rodriguez** to interview EVangelists and cover EV events for public broadcast.

The couple came up with the idea after speaking to Auto Court's **Nelson Cottle** in Dunedin and realising EVs were taking longer to sell than most other cars because people were uncertain about them.

Charged As aims to give people more information and understanding of EVs so they can make informed decisions about acquiring them, particularly with many now coming on to the used import and second-hand market.

"We've been focusing on local ingenuity and found some interesting stories about what people are doing around the community," Oana says.

The Joneses were early EV adopters – they bought a Mitsubishi Outlander PHEV nearly two years ago – because they like the idea of reducing vehicle emissions to help the environment and limit climate change.

"Paul's interested in conservation and the environment and we wanted

to be as sustainable as possible," Oana says.

"It makes economic and environmental sense."



The *Charged As* crew, from left, Michael Henriquez and Paul and Oana Jones, at the Foodstuffs New Zealand electric van fleet launch in Christchurch.

The plug-in hybrid combines two electric motors and a petrol engine because the couple needed the extended range, Oana says.

They charge it mainly at home and say it's good for all of their needs.

The *Charged As* team all have full-time work so most of the EV coverage is done after hours or when they can spare the time.

Projects have included the South Island section of The Better NZ Trust's Leading the Charge EV tour of New Zealand – they still have to air that

episode – and the Foodstuffs New Zealand electric van fleet launch in Christchurch in August.

They expected to be at the evworld expo on September 9 and planned to cover an International Drive Electric Week attempt in Dunedin on September 10 to break the record for the most EVs in one place.

Oana says with more coverage developing, the group plans to make shorter videos but more often.

"We can look at covering any events, projects – not just cars but EV conversions and charging etc."

She and Paul have been members of the EV community for some time and are usually aware of what's happening nationwide.

They hope to gain sponsorship for *Charged As* so they can devote more time and energy to the project.

And eventually Oana is keen to add a Hyundai Ioniq to their own fleet.

Check out the YouTube channel on the website ChargedAs.com or email contact@chargedas.com for more information. ■



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Unitec steps up EV training

Training in electric vehicles is fast becoming a major component of the automotive school at the Unitec Institute of Technology Mt Albert campus in Auckland.

Now housed in Mataaho, a new trades school building, the automotive training facility has about \$8 million in state-of-the-art equipment, much of it centred around EVs.

"Cars are now more computers on pieces of rubber which is why we invested in this kit," vehicle systems lecturer **Lee Bagelow** says.

Training desks with screens and plug-in display boards let students work on various vehicle systems without getting their hands dirty.

Many of the automotive training systems are modular and customisable to specific vehicle and manufac-

turer types.

Templates and plug-in briefcase modules allow the students to "work" on any brand and model available, whether it's a Tesla, Toyota Prius hybrid or a Honda.



Unitec Mt Albert vehicle systems lecturer Lee Bagelow with a Car Train computerised desk.

It allows safe handling while training on high voltage systems, for instance.

Much of the emulation equipment is from Lucas-Nulle in Germany.

Mataaho and the new student service centre Te Puna, worth a combined \$70 million, were officially opened on August 23 by tertiary education, skills and employment minister Paul Goldsmith at a ceremony attended by nearly 150 people.

Unitec is undergoing a major transformation, creating contemporary applied teaching and learning approaches that better prepare students for the future of work.

"These buildings mark a major milestone in that process," Unitec chief executive **Dr Rick Ede** says.

At 7000 square metres, Mataaho

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NEW EV CAR TYPES

MAKE	MODEL	TYPE	PRICING RRP est.	APPROX RANGE KMS
Tesla	Model S	BEV	\$113,695	450 - 570 km
	Model X	BEV	\$129,145	415 - 540 km
Renault	Zoe 22 kwh	BEV	\$68,900	220 km
	Zoe 40 kWh	BEV	\$68,900	300 km
Hyundai	Kangoo van	BEV	\$74,990	160 km
	Ioniq	BEV	\$59,990	220 km
BMW	Ioniq Elite	BEV	\$65,990	220 km
	i3 Full Electric	BEV	\$75,700	200 km
Mitsubishi	i3 - Range Extender	PHEV	\$86,900	200 km + 150 km
	i8	PHEV	\$281,200	37 km + 400 km
	225xe	PHEV	\$69,800	41 km + 550 km
	330e	PHEV	\$91,600	40 km + 550 km
	530e	PHEV	\$136,400	50 km + 600 km
	740e	PHEV	\$202,700	48 km + 550 km
	X5 xDrive40e	PHEV	\$152,700	30 km + 800 km
Audi	Outlander	PHEV	\$60,990	50 km + 500 km
	A3 Sportback e-tron	PHEV	\$69,900	45 km + 600 km
Mercedes Benz	Q7 e-tron	PHEV	\$158,400	54 km + 800 km
	C350 e Sedan	PHEV	\$96,290	31 km + 700 km
	C350 e Estate	PHEV	\$99,790	31 km + 700 km
	E350 e Sedan	PHEV	\$143,890	30 km + 600 km
	GLE500 e	PHEV	\$153,290	30 km + 700 km
Porsche	S500 e	PHEV	\$255,000	30 km + 700 km
	Cayenne S e-hybrid	PHEV	\$177,800	20 km + 750 km
Volvo	XC90 T8	PHEV	\$134,900	44 km + 600 km

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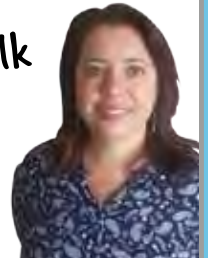
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The Car Man	New Plymouth
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Cooper Auto Company - 04 586 2295 sales@cooperauto.co.nz	Wellington
The Car Company Nelson	Nelson
HVS Motors	Timaru
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Auto Court - 03 455 3000 info@autocourt.net.nz	Dunedin

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USED EV CAR TYPES				
MAKE	MODEL	TYPE	PRICING RRP EST.	APPROX RANGE KMS
Nissan	LEAF Generation 1	BEV	\$10k - \$16k	120 km
	LEAF Gen 2 - 24 kWh battery	BEV	\$16k - \$27k	135 km
	LEAF Gen 2 - 30 kWh battery	BEV	\$25k - \$42k	180 km
	e-NV200b van	BEV	\$20k - \$32k	140 km
BMW	i3 Full Electric	BEV	\$40k - \$45k	200 km
Mitsubishi	i-Miev	BEV	\$10k - \$17.5k	100 km
	B-Miev Van	BEV	\$13k - \$15k	100 km
Renault	Zoe 22 kWh	BEV	\$29.5k - \$50k	220 km
	Zoe 40 kWh	BEV	\$40k - \$45k	300 km
Hyundai	Ioniq	BEV	\$48k - \$60k	220 km
	Ioniq Elite	BEV	\$55k - \$66k	220 km
Kia	Soul EV	BEV	\$32k - \$37k	150 km
Volkswagon	e-Golf	BEV	\$42k	200 km
Tesla	S P85	BEV	\$150k	350 km
	S 90D	BEV	\$172k	420 km
	X 90D	BEV	\$188k	410 km
Mercedes Benz	C350 e Sedan	PHEV	\$83k	31 km + 700 km
	GLE500	PHEV	\$128k - \$130k	30 km + 700 km
Toyota	Plug-in Prius	PHEV	\$25k	26 km + 800 km
Audi	A3 Sportback E-Tron	PHEV	\$50k	45 km + 600 km
BMW	i3 REX	PHEV	\$45k - \$53k	200 km + 150 km
	225xe	PHEV	\$60k	41 km + 550 km
	330e	PHEV	\$58k - \$80k	37 km + 550 km
	X5 xDrive40e	PHEV	\$140k	30 km + 800 km
	i8	PHEV	\$150k - \$170k	37 km + 400 km
Mitsubishi	Outlander	PHEV	\$39k - \$64k	50 km + 500 km
Volvo	XC90 T8	PHEV	\$130k	44 km + 600 km

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

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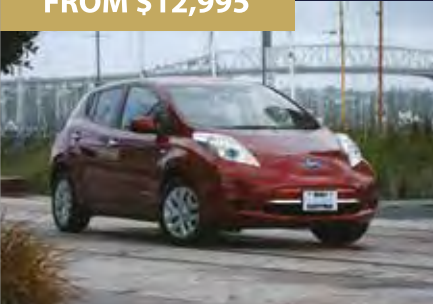
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Used EVs on the political agenda

Politicians from different parties don't often agree on much.

But when it comes to the importance of electric vehicles in the used car market, they seem to have made an exception.

Transport minister **Simon Bridges** recently told *AutoTalk* National's promise to make one third of the government fleet – or 5000 vehicles – electric by 2021 will make a difference in the used car market.



Simon Bridges

That's because when those EVs exit the government fleet, they will get into the hands of private buyers, he says.

His colleague National MP **Jonathan Young** mirrored Bridges' sentiments at the Road Transport Forum's election summit in Wellington last month.

The Greens' transport spokeswoman **Julie Anne Genter** also promoted boosting the number of new EVs on the road, which would eventually trickle down to the used car market.

But the party wants incentives introduced to help businesses switch from petrol or diesel to electric cars, she told the summit.

"If you remove fringe benefit tax off company cars, you create a second-hand EV market in three to five years.

"You've got to invest in infrastructure to give people certainty."



New Zealand First's Denis O'Rourke, National's Jonathan Young, Act's David Seymour, Labour's Michael Wood and the Greens' Julie Anne Genter debated transport issues at the Road Transport Forum in Wellington.

New Zealand First transport spokesman **Denis O'Rourke** says it also favours "phasing out liquid fuels in favour of EVs".

But he says his party would also expect a bigger commitment than 5000 EVs to be purchased by the Government, which in time would favour the private buyer.

"Most New Zealanders buy second-hand cars. If you give businesses a financial incentive to [buy electric] then that flows on to you and I."

Labour's **Michael Wood** pointed out that EVs might be of more use in New Zealand than other places

because the country produces 85% renewable energy.

"EVs aren't the panacea. In Australia and the United States, EVs are powered by coal." ■

EV vision for man on a mission

Continued from page 1

car in the 1980s.

The pair got their heads together to develop the Drop, the one big difference in the three-wheel cars being the Drop's electric power driving the rear wheel.

Planning to launch the Drop in March, Munn says the motor, controls and each battery pack of 30 lithium-ion phosphate batteries (cobalt-less) will be imported but the rest of the car will be made in New Zealand.

Steering is via two joystick-like left and right controls rather than a steering wheel.

It will be marketed under Munn's company, Ierospace Industries International, based in Otara, Auckland.

Munn sought divine intervention to find the company name and says the word "iero" came to mind.

"I had to look it up and found 'iero' is Greek for sacred or holy – and the word 'space' just came along with it."

Munn says he was looking to develop a future in aviation and space applications after learning about flight from a young age.

An "awesome" team of about 25 is

now working on the Drop, comprising engineers from Massey University, Auckland University of Technology and the Manukau Institute of Technology near where he's based.

He's been working in collaboration with and from an office provided by Accelerated Aotearoa as its first entrepreneur-in-residence since January last year.

Others he's involved with include the Low Volume Vehicle Association and the NZ Transport Agency to ensure the EV meets all the requirements.

Munn says the Drop will have a 300km range, will weigh just 150kg yet be strong and safe, and will be motorway legal and capable of doing up to about 110kmh.

Available for on-line order and costing less than \$10,000, the Drop is expected to be available for delivery in kitset from June.

With simple assembly instructions provided, Munn believes it should take no more than 20 hours to assemble, with no technical expertise required.

It will use Combined Charging System (CCS) Type 2 DC public charging,

plus a standard household outlet, and will be capable of being charged from flat in about 12 hours.

The Munns might be among the first to use the Drop. They don't have a car, travelling mainly via public transport.

"Traffic congestion here is worse than many parts of Los Angeles," he says.

Meanwhile, Munn hopes to attract more investors to the project.

The Munns work to fund both it and their living, with Ira taking up acting roles in various television, film and commercial segments – he learned drama at his Los Angeles church.

There's little doubt this man of vision will move heaven and earth to get his zero-emission commuter car on the road.

Visit www.ierospace.com for more information. ■



The Seraph aircraft.



An artist's impression of the Drop.

Plenty of scope for autonomous trials

Continued from page 5
rental car depots or other customer services.

What about passenger cars?

Volvo New Zealand general manager **Coby Duggan** says last year's XC-90 demonstration drive in Tauranga highlighted what the technology could do at that point.

"The pilot assist at that stage was the most advanced autonomous technology. It's been enhanced further for 2018.

"The pilot assist can brake for itself, accelerate for itself and steer for itself between

lane markings.

"Every model brings with it another set of enhancements. It started life as intelligent cruise control."

The XC-90 offers level 2 or partial autonomy, with the driver able to take back control. The scale ranks vehicles between one and five, with level 5 vehicles fully autonomous.

Autonomous vehicles might be a strange concept for some members of the public but they will eventually become more and more commonplace, Duggan says.

"It's quite disconcerting for some customers. Au-

tonomous driving is never about taking away the fun bits. It's about taking away the boring bits.

"For us it's about rolling out the technology as it arrives and as the customers get more familiar with it."

But autonomous technology needs roading infrastructure to be up to scratch.

"It's quite geared towards infrastructure, which proves the value of good quality lane markings.

"The tricky thing is technology in cars is moving much faster than infrastructure is. We need to be clear

about what the infrastructure requirements are."

Duggan would like to see more autonomous trials here through Volvo but he says there's worldwide competition for that honour.

There are three large Volvo trials starting soon in Gothenburg, London and Shanghai, he says.

In the Gothenburg trial, fully autonomous XC-90s will be given to Swedish families.

Back in the Kiwi market, Duggan says it's too early to know how autonomous driving will affect the car ownership model. ■

POWER DEALS FOR EV USERS

Company	Energy Deals	Where	Cost to charge LEAF*
Mercury 	Plug-in Vehicle Fuel Package Includes 20% off your entire home's electricity costs between 11pm – 7am every day, one year fixed term, 12% PPD is included in these calculations.	Auckland Wellington Christchurch	\$5.21 \$5.08 \$5.03
Contact Energy	Freedom plan Excellent night rates, no fixed term, 22% PPD has been included, check if the matching daytime kWh rate will affect your overall bill.	Auckland Wellington Christchurch	\$5.09 \$4.34 \$3.05
Ecotricity	Low Solar Low Usage plan for EVs & can buy back solar energy, no fixed term	Auckland Wellington Christchurch	\$5.63 \$3.84 \$4.85
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	\$5.72 \$5.50 \$5.65
Flick Electric	Wholesale rates plus their Flick Fee. No fixed term, EV rate in Wellington. Calculated using a slightly higher average spot price of 5.7c per kWh.	Auckland Wellington Christchurch	\$5.21# \$3.16# \$3.57#
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	\$5.78 \$3.58 \$3.15
Meridian	Rest Easy EV plan Lower night rate from 9pm to 7am, 3 year term, 15% PPD is included in these calculations, check if the matching daytime kWh rate will affect your overall bill.	Auckland Wellington Christchurch	\$4.49 \$3.79 \$2.55
Paua to the People	Cheap As Plan with EV night rates No fixed term. Calculated using a slightly higher average spot price of 5.7c per kWh	Wellington	\$2.96#

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

Please note that rates vary around New Zealand – the above costs were from Mt Wellington in Auckland, Northland in Wellington and Linwood in Christchurch. They can also depend on your meter type & the company you use. Prices vary at the different times of the day eg charging during the day may have higher costs. Flick Electric in Christchurch has higher daytime rates in Winter due to variable pricing from the lines company.

The rates we have used above were calculated in July 2017 using a low user cost, overnight rates, includes 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. Prices above may not include extra discounts that some companies have available eg online discounts, etc. 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 future prices.

Electric future for vans

An electric van from Chinese manufacturer LDV is now in New Zealand.

Strong interest is already being shown in the LDV EV80 pure electric van. Orders are being taken and delivery is expected in December.

The 10.4 cubic metre cargo van can carry a 1000kg payload and fits up to three pallets.

Its high-efficiency lithium iron phosphate battery can be fully charged in two hours and will give a range of 150km to 180km with about half the maximum payload.

The LDV EV80 has been used in China for more than four years. The prototype vehicle here is largely based on the proposed United Kingdom market specifications. New Zealand specifications are still to be finalised.

It's suitable for trades such as builders and contractors, couriers, as a shuttle or for a variety of other work and passenger-related purposes.

The van uses DC fast-charging with a CCS Type 2 inlet plug but an on-board AC inverter could be available by about March to allow for home charging.

The LDV EV80 is from the SAIC stable, the largest automotive maker

in China.

It's being marketed through **Warren Willmot** of Great Lake Motor Distributors, the importer-distributor of LDV and SsangYong.

fractionally less on all counts for the chassis cab.

It seats three in the front and comes with a factory bulkhead to isolate the cargo, and a left-side slide door.



Pricing will be on application but could be around \$80,000 for the panel van version.

The EV80 is about 5.7m long, just short of 2m wide and about 2.3m high for the long-wheel base van and

The rear of the van is very well kitted out, with an insulated soft floor covering and well-placed, sturdy anchor points.

The van has a gross vehicle weight of 3600kg, incorporates a permanent magnet synchronous motor (100kW/320Nm), can reach up to 107kmh and uses a 56kWh battery.

Brakes are front and rear discs, and it has ABS and EBD systems.

It's equipped with halogen headlights and daytime running lamps and has reversing sensors, although a camera can easily be fitted.

The EV80 is essentially the same or similar spec to the current diesel V80 series, with driver and passenger airbags included.

Willmot describes the van as functional and able to do the job well.

He says the sales focus will be on fleets.

"Vans like this make a lot of sense for businesses on the road all hours."



Continued on page 15

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He's hoping to turn over about 50 in a year and says interest and pre-sales enquiries have been particularly strong. "People have already put money down for them."

Willmot says the cab chassis version is very versatile and can be used for a multitude of purposes such as a curtain sider, flat deck or camper.

A local ten-seater minibus conversion has already been ordered by a customer. Jackson Enterprises, a specialist fitout and coach conversion business based in Otago, has a special flooring and seating system being flown in from the United Kingdom for this.

Willmot says the EV80 series is now undergoing compliance for New Zealand, which will be completed in November.

The vehicle will be officially launched on September 28, alongside LDV's new one-tonne ute range, the T60, and a new large seven-seater SUV called D90.

Large commercial vans of this size are not tested by ANCAP. But Willmot says safety is a priority for SAIC and LDV and they're committed to future models achieving a five-star safety rating.

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



On the road: Smooth and simple

By Richard Edwards

There is not a lot difference between driving the EV80 and its diesel equivalent. If anything, it's a little simpler and easier.

There is a traditional automatic transmission shifter. Pop it into drive and go. The manual handbrake of the other V80 is replaced by a space-saving and convenient electric unit.

The EV80 is not quick but its ac-

celeration is steady. Drivetrain noise is quiet, even for an electric vehicle.

The brakes are very strong, although over the diesel you do feel the extra battery weight the van is carrying.

That weight assists in other ways. The ride is not as bouncy as in some

large vans when empty and it feels uncannily flat when zipping around a roundabout.

We didn't get a chance to try the LDV with a load on board but the company assures us it has found little difference in performance. Considering the torque on offer, that's unsurprising.

It could also be down to the way the van is geared – it's set up for real-world speeds, topping out

before it hits even 110km.

Will the lack of AC charging hurt initial sales? That will depend on the operator and if they have the fleet size for some form of DC charging at their depot.

AC charging – available next year – will make it far more appealing to small operators. Using public DC charging options is not always convenient and makes it a challenge to start the work day with a full battery. ■

Unitec steps up EV training

Continued from page 9

is New Zealand's largest open plan trades training facility. Its design reflects a modern worksite with many disciplines nearby, giving students exposure to a range of specialties.

It houses not only automotive-related training but courses in construction, plumbing, drainage and electrical.

Mataaho has a huge variety of specialised tools and equipment, complemented by the largest range of virtual reality, augmented reality and emulation equipment for trades training in the country.

These include virtual reality head-

sets for learning - including welding, a virtual spray-painting booth and automotive emulation equipment.

Engineering, construction and infrastructure dean **Renee Davies** says combining traditional hands-on training with simulation and emulation equipment gives students extra time to practice, allows them to revisit lessons and enables them to use enhanced visual tools.

"We can set up our automotive emulation equipment to match proprietary manufacturer technologies or to include advanced systems such as hybrid or electric drivetrains."

Mataaho also allows Unitec to collaborate with the wider construction and automotive industries, opening the doors to organisations wanting to train staff on the latest techniques and technologies.

Unitec has partnerships with Giltrap Volkswagen, Lincoln Electric, Makita, Repco, Pullman Group, Dulux International and Dayle ITM.

The sale and development of land within Unitec's 55-hectare campus helped it fund the construction of the two buildings.

Visit www.unitec.ac.nz for more information. ■

Children loving their Gobabygo wheels

Jacqui Madelin realised the value in giving children greater mobility when she saw a YouTube clip about United States paediatric researcher **Cole Galloway** who'd studied the effects of immobility on small children.

He'd realised how dramatic those effects were when children with impaired movement were given the means to get about independently and pioneered an affordable method to adapt toy ride-in electric cars.

"Kids who are mobile find it easier to make friends, relate to their brothers and sisters; they learn boundaries and even their cognitive pathways improve," Madelin says.

"Young children given independent mobility improve their confidence and gain greater freedom using these cars."

Better still, instead of being the outsider "they become the cool kid with the cool toy!"

Madelin thought the concept could work well in New Zealand and knew just the man to help.

Mark Prujean agreed and within months a small board was formed and started the process of putting the first Kiwi kids into a Gobabygo car.

Galloway, a professor of physical therapy at the University of Delaware, has since visited Gobabygo NZ.

"We studied mobility and immobility, and how that impacts a child's ability to learn and socialise with peers, and what we see is a striking difference," he says.

"Fun is key as it unlocks

brain development and a child's exploratory drive, while sparking active, engaged play from adults and peers."



Elli's cerebral palsy affects her legs but with an electric car she can now keep up with her twin sister on her scooter. Gobabygo's Jacqui Madelin, centre, looks on as Elli's mum gives encouragement at the car hand-over.

Galloway and his students developed a reliable and affordable way to modify off-the-shelf toy cars so children who can't crawl or walk normally can become part of the action at home, at kindergarten or in playgrounds.

And he made the system available to parents and medical people worldwide.

The New Zealand organisation was one of the first to form, in August 2014. It became an incorporated society with a board of six volunteers - including Madelin - overseeing GoBabyGo here.

The first three cars were provided to a child with heart disease whose mobility is severely limited by fatigue without the car and who can now keep up with her siblings; a child with a chromosome abnormality that meant at age three she was smaller than her one-year-old brother; and a six-year-old with cerebral palsy.

Soon after, specialists in child therapy and behaviour here quickly realised the value of the cars.

"Once they'd seen the effects on these kids and how easy it was to adapt the cars, we knew we had something to carry on with," Madelin says.

GoBabyGo NZ began working with hospitals and organisations such as Kidz-first Children's Hospital and Nelson Hospital before rolling the programme out to the rest of the country.

It donated 50 cars in the first year, 70 in the second and aims to increase that each year until every eligible child from 18 months to around seven years has a Gobabygo car.

By early July it had 162 kids on its books.

Prujean manages the cars

and adaptations.

"Nearly all the kids need a harness and backrest, and a remote is available so parents can help with control," he says.

Some children need the throttle on the steering wheel or in the headrest. Others need the remote to move but are able to steer using extra handles affixed to the wheel.

"The cars can even be adapted to take a specialist wheelchair seat, which clips to the special frame, or to a car seat base, or to the wheelchair, so the child always has the support it needs."

Children using the cars include those with cerebral palsy, muscular dystrophy, Downs Syndrome - which can delay development - heart conditions, developmental disorders and more.

Once an application comes in, a small team establishes each child's specific requirements alongside their doctors, therapists and



Mark Prujean, left, with Tauranga GoBabyGo electric car recipient Cullen and his mum.

parents - such as whether they need encouragement to sit upright.

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EVSE for everyone

Rapidly growing interest in electric vehicles has helped unite two sections of a company.

YHI (New Zealand) Ltd is part of a global group with a significant part of the global alloy business and automotive tyre distribution.

It set up a power division nearly 14 years ago to deal with things like industrial batteries, solar power, DC and UPS power units and more.

Now the huge interest in EVs has brought the two sides together in the distribution of Electric Vehicle Supply Equipment (EVSE).

To illustrate the speed of the change, YHI (New Zealand) Power Systems senior sales engineer **Aaron Gillon** was in Taiwan on business and saw one of their existing suppliers was making EV chargers and internal components for vehicles.

"I didn't take much of an interest at the time," he says.

"But a week later back in New Zealand I was asked by some customers about buying some EV chargers.

"The next thing, a few hundred seven kilowatt chargers were sold. We had to fly 50 in and were supplying 150 within a month or two."

Gillon says it began "a massive learning curve" on EVs and brought about the company's first cross-over product.

YHI now supplies chargers to car dealers, installers, wholesalers and some utilities – but not the public.

"Within three years there's been massive growth," Gillon says. "Every day I'm swamped with EV enquiries."

He's getting a Hyundai Ioniq as a company car, the company's first pure electric, so he knows the demand.

"Just about all my customers have EV charging."

YHI (New Zealand) has now become the exclusive distributor for Rolec EV, a division of United Kingdom based

company Rolec Services.

Rolec EV designs and manufactures EV charging solutions, offering quality products at competitive prices.

A wide range of chargers is offered - from the entry level WallPod: EV Ready unit to the highly sophisticated EV ControlCentre - to suit every location and budget.



Aaron Gillon.

Its product range is designed and built to be flexible and compatible with all leading motor manufacturers' EVs and their communication protocols, including all types and modes of charging.

Through YHI (New Zealand), Rolec

ish automaker has said that from 2019 it will make only electric or hybrid cars, starting with their manufacture in China.

Gillon says Rolec EV products come with a lot of options and a very customisable system. Various pedestal charging systems are available, including coin or token operated ones.

But the most popular are the WallPod units, including one with a domestic socket for other uses. Another has an automatic timer to take advantage of power at off-peak rates and also incorporates an override button in case instant charging is needed.

There's a CubiCharge portable charging box with Mode 3, Type 2 points from 1way to 4way formats, suitable for showrooms, service centres, EV promotional events and the like.

Most of the units – particularly the SecuriCharge ones – are vandal-proof.

"Yes, there is a little bit of EV envy out there," Gillon says.

Type 1 and Type 2 leadsets can both plug into the same charger, which means a Japanese or United States EV can be charged up alongside a European brand.

Options extend to the colour range as well. About 25 different colours were to be featured at the YHI (New Zealand) display at the ewworld show in the

Vodafone Events Centre in Manukau on September 8 and 9.

Primarily stocking the black and red WallPods to match its Neuton Power brand, YHI has other colours available either in stock or within a reasonable lead time. Unsurprisingly, the black and red scheme has been very popular in Canterbury.

"Our motto is 'EVSE for Everyone'," Gillon says.

Contact YHI on 0800 877 359 or ev@yhi.co.nz or visit www.rolec.nz for more information. ■



The Rolec EV charging family.

EV can offer personalised ranges to suit individual client requirements, specifications and branding.

And they can be provided for the home, for commercial premises or for public charging sites.

Rolec EV has been specialising in the products for the past eight years and its clients now include Jaguar Land Rover, DHL, Kia, Nissan, Airbus, Sony, Gatwick Airport, McDonald's and many others.

"Rolec have just finished a roll-out for Volvo too," Gillon says. The Swed-

EV projects charging along

Electric buses that charge as they stop to pick up passengers and on-street charging for residential areas are no longer just great ideas New Zealand should consider.

They're happening here under the latest round of the Low Emission Vehicles Contestable Fund administered by the Energy Efficiency and Conservation Authority (EECA).

Funding of \$3 million has been conditionally approved for 15 projects, several of which involve the roll-out of heavy vehicles into New Zealand's fleet.

Tranzit Group has won close to \$340,000 for an exciting project to trial super-fast charging infrastructure for buses.

The project will trial a drive-through, super-fast opportunity charging system.

Such systems could be located at bus stops and a charge delivered while the bus stops to pick up passengers.

The project will be composed of a containerised 450kW opportunity charger with an overhead charge mast and associated vehicle-mounted equipment for one bus. The charger can be relocated to allow demonstrations at different locations.

Another project that has people in Wellington fizzing is on-street electric vehicle (EV) charging options for residents who don't have a drive-way or garage.

A successful bid for \$176,000 funding will see Wellington City Council work with ChargeNet NZ to develop and deliver residential on-street charging for the one in four Wellington city residents without off-street parking.

The project will deliv-

er up to 50 charge points in residential areas on request from residents without access to their own charging.

It's a model inspired by world-leading EV friendly cities but has not yet been demonstrated anywhere else in New Zealand.

Less novel but just as needed is



Elizabeth Yeaman is transport development manager at the Energy Efficiency and Conservation Authority (EECA) where she has worked for 20 years. She coordinates and oversees EECA's EV information campaign and the Low Emission Vehicles Contestable fund. Before joining EECA she worked for a New Zealand-based transport energy consultancy, mainly in developing countries. She holds a Masters degree in natural resource engineering and is a member of the Institution of Professional Engineers and the Chartered Institute of Transport and Logistics.

funding for charging stations – almost \$1 million for projects around the country. These include servicing key tourism routes including Christchurch to Picton, the lower South Island, the East Cape and the far North.

All the projects funded add to the momentum building in New Zealand with more people and businesses making the switch to EVs.

People are really starting to get that EVs are cheap to run and maintain.

If you are interested in getting an EV project off the ground, consider applying to the fund before the third round closes on September 27.

We are keen to see projects that can be replicated across the country. They should support practical, sustainable ways to increase EV uptake, particularly in the light fleet market, close gaps in charging infrastructure and demonstrate the uses of heavy electric vehicles across the economy.

The fund offers up to 50% funding towards projects - applicants must match

or exceed the amounts granted.

The fund is one of 14 initiatives in the Government's Electric Vehicles Programme which has a target of doubling the numbers of electric vehicles every year to reach 64,000 by the end of 2021.

For more information about the fund go to www.eeca.govt.nz and for general information about electric vehicles see www.electricvehicles.govt.nz ■

NZ EV INDUSTRY NEWS

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Going the distance: tips for EV sales

An increasing number of used car buyers are being attracted to the benefits of electric vehicles (EVs).

Running costs equivalent to buying petrol at 30c per litre, the smooth and silent performance, reduced maintenance costs, knowing that driving an EV is better for the environment and reduces our dependence on imported oil are all part of the attraction.

Many dealers have responded to the demand by stocking EVs and those who are making real sales progress have taken the time to understand the vehicles and be ready to respond to the questions potential buyers ask.

Two of the most common are how far a car will go on a single charge and how long the battery will last – from customers who might have “range anxiety”.

Range anxiety can relate both to the immediate travel range of an EV on a single charge but also the long-term life of the battery.

Many potential buyers will have encountered battery degradation in personal electronics such as smartphones and laptops and will require reassurance that an EV battery will not let them down as a longer-term purchase.

But when it all boils down, range anxiety is a red herring: many EV owners will end up with better range after an overnight charge than they would with an equivalent petrol car that they put in \$10 or \$20 worth of petrol in every other day.

Recent independent research commissioned by the Energy Efficiency and Conservation Authority indicates EV batteries are designed to drive and recharge for many years with high reliability and could well last the life of the vehicle.

In fact, most new EVs have extensive battery warranties and owners can expect batteries to last well beyond the warranty period.

To counter perceived range anxiety, dealers need to establish how a pro-

spective purchaser uses their current car and clearly understand their needs before making recommendations.

A purchaser could use their vehicle to travel 30km a day, say, for shorter commutes, school drop-offs or local errands. Coincidentally, this is the average distance travelled in New Zealand.

In this scenario, even a vehicle with



By VIA membership and technical services manager
Malcolm Yorston

a battery health of 60%-75% would be more than adequate. That's providing the owner plugs it in overnight at home every other day.

If the purchaser uses the car for a daily commute of 60km-80km, plus side trips, a car with a battery health of 90% to 95% is more appropriate. This could then be plugged into the mains every night to recharge ready for the next day.

Dealers also need to educate purchasers on best practices for charging their cars.

Some tips for EV owners to maximise travelling range on a single charge and the overall longevity of their battery:

Maximising driving range

Minimise the use of heating and air-conditioning on long trips because these will reduce the range you can go on one charge.

Keep tyres correctly inflated according to the manufacturer's

instructions – under-inflated tyres will reduce range.

When you need to replace tyres, ensure you buy fuel-efficient tyres which will maximise vehicle range.

Avoid aggressive acceleration, braking and tail-gating.

For long journeys, such as holidays, plan ahead using an app to see where to recharge.

Remember that range is reduced in cold weather and high winds.

Optimising overall battery life

Charge at home overnight.

Limit the number of rapid charge cycles.

Charge to 80% rather than 100% where possible; a fully charged battery is under greater stress than a partially charged battery and that can lead to faster degradation.

Minimise operating your EV battery below 20% remaining capacity on the display.

Park and recharge in the shade where possible.

The lists are not exhaustive but they cover the key factors in maximising EV driving range and preserving battery life.

The Government has also produced advice on how EV owners can get the most out of their batteries – look for the EV Battery Best Practice Guide at www.energywise.govt.nz.

If you're a dealer your priority is to establish what the customer's needs are so you can tailor a vehicle package that best meets them as well as providing education on best practice.

With the right sales and service, urban myths will be replaced over time with happier and better-informed EV drivers. ■

EVtalk

Keep up with the Electric Vehicle industry news

evtalk.co.nz

Fleets of e-bikes to beat the traffic

Fleets of electric bikes for Auckland businesses are being launched this month.

Big Street Bikers aims to have 10,000 e-bikes on the city's streets by 2020.

It's about beating the traffic and parking congestion, and having people buzzing on the freedom of biking again, company spokesman **Andrew Charlesworth** says.

The service is designed to make it as easy as possible for companies of any size.

An annual lease based on the number of bikes in the fleet will allow firms to get branded e-bikes, fleet management software, Bluetooth locking, regular servicing, on-call courtesy bikes and safety training and storage, all without getting grease on their hands.

Charlesworth says they're already talking to some of Auckland's largest and most innovative employers.

It's about building an e-bike culture centred on fun, freedom and personal expression, he says.

"We're also empowering organisations and individuals to do something about the congestion problem rather than complaining and waiting for the government."

The main drivers for the venture include parking pressure, the time it takes to get between offices and meetings around town, plus the chance to escape the office at lunchtime for fresh air, exercise and fun, he says.

To encourage more staff to commute, the company is also offering a subscription service - \$29 a week for 24 months, plus a joining fee.

"It's ideal for the daily commute with the added benefit of using the e-bike for weekend pleasure, to the shops or to grab a coffee," Charlesworth says.

"After 24 months, they own it!"

Employers can consider subsidising the cost through a travel allowance or wellness programme to make it even easier for staff to be rolling on two wheels rather than four.

Big Street Bikers founder **Matt Weavers** says firms can do more to help solve Auckland's transport issues.

"With central city carparks costing up to \$60 daily, a \$29 per week subsidy for staff should be a

no-brainer," he says.

"Big Street Bikes are cheaper than the bus, faster than sitting in traffic and, most importantly, much better for your booty."



More than 300,000 commuters travel a bikeable 5km daily into the city and, with continued cycleway investment by Auckland Transport and the NZ Transport Agency, e-bikes are an excellent solution to traffic congestion, the company says.

Its e-bikes are tested and tweaked to New Zealand conditions. Most have a 36-volt 300W brushless motor with five-speed pedal assist, a thumb throttle and a 10AH removeable battery.

They come with a 30km-50km range, depending on the number of hills, and can reach more than 35km/h. They also have disc brakes, seven-speed Shimano gears, LED headlights, an intelligent LCD controller, a horn, front suspension and more.

About 36 million e-bikes were sold

globally last year, outselling electric cars nearly 300 to one.

Patrick Reynolds, the deputy chairman of transport lobby group Greater Auckland, says e-bikes are the "truly transformational urban technology of our age".

That's because they have the power to radically change the shape, performance and economics of cities everywhere, Reynolds says.

Big Street Bikers' move follows a New Zealand Institute of Economic Research report showing Auckland traffic congestion costs the local economy up to twice as much as previously estimated.

Benefits from Auckland road decongestion put such benefits to the city's network capacity at \$0.9 billion to \$1.3 billion (1% to 1.4% of Auckland's GDP).

If the average speed across the Auckland network is near or equal to the speed limit (known as free-flow), the estimated benefit on weekdays is \$1.4b to \$1.9b (1.5% to 2% of Auckland's GDP).

The report notes that travel times are expected to worsen over the next ten years, despite planned investments to expand the network's capacity.

Auckland Transport projects that more than a quarter of the arterial network will be congested by the end of this year, with continuing population growth meaning more vehicles on the road each day.



The BSB electric bike has a 30-50km range and a 35km/h top speed.

For more information call Andrew Charlesworth on 0274 929929 or email andrew@bigstreetbikers.com. ■

The pros and cons of plug-in hybrids

Living with a new BMW 225xe Active Tourer plug-in hybrid car from May to August was an enlightening experience for the Auto Media Group team.

Although the primary custodian of the 225xe was group chief reporter **Robert Barry**, other staff members used the vehicle to comment on its abilities as a fleet and family run-about.

In our first long-term report in the June 2017 issue of *EVtalk*, we reported the 225xe combines a 100kW 1.5-litre turbocharged petrol engine which drives the two front wheels while a 63kW electric motor propels the rear wheels.

It's an interesting combination of power trains because the car will move off silently

in EV mode and then, when needed, the melodic three-cylinder petrol engine will kick in, reminding you this is a hybrid and not a fully electric car.



But there's always plenty of power on tap when needed and for day-to-day use the 225xe is quite fun to drive, which is not a great surprise because it sits on the same UKL platform as the Mini Countryman.

BMW quotes combined fuel consumption of

2.1L/100km and CO₂ emissions of 49g/km but that can only be achieved if the car is plugged into power at every possible opportunity.

The overwhelming conclusion we all came to is the 225xe is best suited to people living in an urban environment who have good access to charging stations at home and at work, and can maximise the opportunity to plug in when out and about in everyday life.

Although BMW quotes a pure EV range of 41km for the 225xe, realistically we found it was closer to 30km to 35km, depending on how hard the car was driven and how often the air-conditioning was used.

But this range was still more

than enough for the chief reporter's 22km daily commute.

Achieving the quoted consumption figures was always going to be a tough ask, as most of us didn't have access to power overnight and therefore most of the charging was done every day in Auckland's Downtown carpark where we had access to a convenient charge point.

Our figures for the three months of using the 225xe hovered between 4.5L/100km and 5.5L/100km, especially because during the winter the car was often parked outside overnight and therefore consumed more electricity as it needed demisting in the mornings before setting off to work.

The BMW has some

Continued on page 23

Children loving their Gobabygo wheels

Continued from page 16

Then stop, go, steering and protective adaptations are tailored to suit the individual child.

The cars themselves are bought from a factory in China, which supplies a standard, New Zealand-approved specification, a container-load at a time to keep them cost-effective.

The battery takes a night to charge and lasts about two hours, which is sufficient for most recipients with their limited stamina.

Gobabygo NZ chief executive officer **Gilli Sinclair** says New Zealand has a good disability equipment funding scheme but chil-

dren and families are often not ready to go into wheelchairs and powerchairs.

Such disability equipment can also set a child apart from siblings or same-age peers. But an age-appropriate ride-in electric toy encourages interaction with siblings and friends, and often encourages children to improve muscular control, for example.

Run by volunteers, the organisation relies on donations to pay for cars and adaptations so there's no cost to families involved. It has picked up some sponsors – such as BMW NZ and Zyber – and benefits from Rotary fundraising.

"Just last week Oxford Finance, part of the Turners Group, handed us a \$3500 cheque raised by its employees," Madelin says.

"But more sponsors are needed as are volunteers in the regions who can help identify kids in their area and hand over their local cars."

For Madelin, the reward is seeing the expression on a child's face when they first get behind the wheel – and seeing a mum's face when she realises all her children can now play together.

Visit gobabygo.org.nz

or Facebook.com/gobabygonz for more information and sponsorship details. ■



Charlie has his first taste of independent movement in a Gobabygo car, with dad on the remote in Christchurch. Photo: Dolce Wedding Photography

Continued from page 22

clever technology on board such as allowing an owner to pre-set the charging time at home to make use of cheaper off-peak electricity and activating the climate air-conditioning in the morning before unplugging the car to set off.

Through the BMW Connected app, not only can you locate where the vehicle is parked, if necessary you can remotely turn on the climate air-con, flash the lights and honk the horn. The first two functions seem quite useful but the latter two seem a bit gimmicky.

To maximise the fuel efficiency and electric range of the 225xe, we did our best to increase the amount of time it could be plugged into power.

It became somewhat of a challenge to find a suitable charging point around inner and central Auckland but the Plug Share app meant we were often able to find suitable stations near the places we wanted to get to during work days and weekends.

The 225xe's compact footprint, tight turning circle and ability to fit four people in comfort – provided the optional rear picnic tables mounted to the back of the

front seats were removed – made it a useful "pool" car when required.

However, unlike the



regular (non-hybrid) 218i Active Tourer, the 225xe has to make do with a smaller 400-litre boot space because of the positioning of the battery and electric motors in the rear.

Unlike the 218i, the rear

seats in the 225xe don't slide forward and back nor will they fold completely flat. And the boot floor cannot be lowered either.

These weren't major issues for us during our three-month test period but for people with young children and large strollers, the lack of flexibility around using the rear space might stop them considering the plug-in hybrid option.

The 225xe is not going to be everyone's cup of tea but for those people who can use it as it was intended, it will be a very practical and stylish mobility solution. ■

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EV registrations continue climbing

August was another record month for EV registrations. **Actual registrations totalled 4121 – up from 3797 in July.**

Adding in NZ Post's electric Paxter delivery vehicles

brings the August total to 4541 according to Ministry of Transport statistics. The August target of 3175 was well exceeded – with or without Paxters.

"These are encouraging figures," The Better NZ

Trust's **Dee West** says. "There are many events being planned all over New Zealand for International Drive Electric Week. So we hope many more people will get to ride and drive in EVs this month and experience how great these cars are."

In August, 331 vehicles were registered, made up of 240 used import vehicles and 91 used vehicles.

In the new vehicle market, the most popular electric vehicle was the Tesla Model X on 21 units, followed by the Model S on 15.

The Hyundai Ioniq

was third on 10, while one pure-ev BMW i3 was registered.

The Mitsubishi Outlander was the most popular plug-in hybrid on 22 units, followed by the Audi A3 on eight and BMW X5 on five.

Leading the import market, and the most popular electric vehicle overall, was the Nissan Leaf on 175 units.

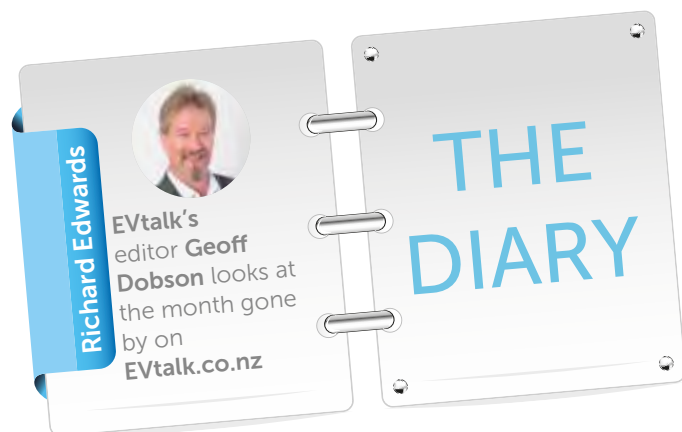
Second place was the closely related Nissan e-NV200 on 12 vehicles, mostly headed for the Food-stuffs fleet, followed by the Renault Zoe on two. ■

NEW MAKES AND MODELS AUGUST 2017

Make and Model	August 2017
ELECTRIC	
Tesla Model X	21
Tesla Model S	15
HYUNDAI IONIQ	10
BMW I	1
PLUG-IN HYBRID	
MITSUBISHI OUTLANDER	22
AUDI A3	8
BMW X5	5
MINI COUNTRYMAN	3
BMW I	2
PORSCHE PANAMERA	2
KIA NIRO	1
MERCEDES-BENZ C-CLASS	1

USED IMPORTS AUGUST 2017

Vehicle Make	Vehicle Model	Total Vehicles
NISSAN	LEAF	175
NISSAN	E-NV200	12
MITSUBISHI	I-MIEV	5
RENAULT	ZOE	2
BMW	I3	1



August 1

Maserati moves to electrification

All new Maserati cars will have an electric and/or a hybrid version of each model in the range from 2019.

That's the message from Fiat Chrysler Automobiles (FCA) chief executive officer Sergio Marchionne.

The move is similar to Volvo's, which last month said it would also be pushing towards electrified travel from the same year, the *Express* reports.

Californian EVangelist meets and greets

Chelsea Sexton, the EV advocate from the *Who Killed the Electric Car?* documentary, was in Penrose at GVI Electric for a meet-and-greet evening with EV enthusiasts.

She spoke about where she thinks EVs are heading around the world, including various mandates encouraging OEMs to build electric cars.

Sexton then fielded questions, with plenty of discussion around whether there would be enough electricity generation to cover EV charging, how China will affect EV uptake and a bit of "geek speak" on charging infrastructure.

August 2

Low Carbon Challenge on again

Applications have opened for this year's Wellington Low Carbon Challenge to help find innovative ways of reducing the area's carbon footprint.

Launched on August 1, the challenge's fourth an-

nual round will support six successful teams to develop their low carbon project or business. It also marks the launch of the Wellington Low Carbon Partnership Fund.

The city-wide open fund supports projects entering the challenge by providing dollar-for-dollar funding to crowd-funding campaigns to amplify the work of local communities.

EV super highway for Queensland

A 2000km super highway for electric vehicles on Queensland's east coast will have up to 18 charging stations rolled out over the next six months at a cost of \$3 million.

The EV stations will be free to use initially and will be spaced about 30 minutes' drive apart from the Gold Coast to Cairns, a popular route for tourists.

The plan to create the world's longest electric super highway in one state was announced by environment minister and acting main roads minister Steven Miles on July 27.

Car dealer 'tricks' help sell Tesla

Elon Musk's introduction of his cheapest Tesla model is drawing comparisons with the way dealers have pushed traditional cars for many years.

Tactics for marketing the Tesla Model 3 have been similar to how other car dealers advertise, Bloomberg reports Barclays analyst Brian Johnson as saying.

Tesla generated more than 500,000 reservations for the new electric sedan, partly due to its US\$35,000 base price. The company has announced the total cost for a fully optioned Model 3 could reach

US\$59,500, beyond many mainstream buyers.

August 3

Rental car hub future-proofed for EVs

Five of Christchurch's biggest car rental brands – Avis and subsidiary Budget, Hertz, Thrifty and Apex – have joined forces to return to the central city in the new International Rental Car Precinct.

One of the features of the new \$10 million terminal on the corner of Manchester St and Kilmore St is its electric vehicle charging stations.

While most of the companies don't currently use EVs, Thrifty New Zealand general manager **Emma Gardiner** says her company is considering introducing them later in the year.

August 3

Eahead of schedule

The country's first fully electric double-decker buses will now hit Wellington's streets much sooner than expected.

Bus company Transiti, which will begin operating 60% of the Wellington region's commuter bus routes from July next year, says 10 electric double-decker buses will feature among its 234-strong fleet, Stuff reports.

August 4

EV charging at Mystery Creek

Two new electric vehicle charging stations have opened at Mystery Creek Events Centre's headquarters.

The New Zealand National Fieldays Society commissioned the chargers, which were opened by its chief executive Peter Nation, Waipa Networks chief executive Adam Fletcher and transport minister Simon Bridges.

Nation says it was approached by Waipa Networks and Hyundai NZ about installing the stations at Mystery Creek.

August 5

Foodstuffs launches electric van fleet

The first of 28 all-electric vans for Foodstuffs New Zealand's fleet have been revealed at a ceremony in Christchurch.

The company paid \$500,000 and received the same amount from the Energy Efficiency and Conservation Authority's low emission vehicles contestable fund to bring the Nissan e-NV200 vans from the United Kingdom.

Nichibo took care of the delivery logistics and the vans are in New World, Pak'n Save and Four Square livery.

August 7

EV owners needed for home charging trial

A trial to assess EV owners' home charging behaviour and how it affects electricity demand is being conducted by Wellington Electricity.

Those involved will help shape the future electricity lines prices for EV charging and assist with the adoption of EVs in New Zealand, the company says.

To participate, households must have one or more EVs they regularly charge at home and live in Wellington Electricity's area.

Electric car use encouraged on work trips

More than 100 companies are encouraging their employees to use electric cars on work trips.

The Electric Day Pass, launched at Christchurch International Airport in May, enables frequent fliers travelling between Auckland, Wellington and Christchurch during the week to book a free electric Volkswagen e-Golf for their visit, Stuff reports.

The programme involves Volkswagen, Europcar rentals and the three main-centre airports.

Continued on page 22

Continued from page 21

August 8

Tesla looks for funding to expand production

Tesla intends raising US\$1.5 billion in debt to expand its Model 3 production.

It won't raise more capital through equity but is considering another round of debt through senior notes, *Elec-trek* says.

Tesla says it intends to offer "subject to market and other conditions, \$1.5 billion in aggregate principal amount of its senior notes due 2025".

Carmakers announce EV joint venture

A joint venture to develop EV and connected-car technologies has been agreed between Japanese automakers Toyota and Mazda.

The pair announced plans to take a stake in each other and extend their work together on shared models and production, including the construction of a plant in the United States and electric vehicle development.

Toyota will take a 5% stake in Mazda and Mazda a 0.25% stake in Toyota.

August 9

More benefits for EV owners

EV drivers might soon be able to use bus and high occupancy vehicle lanes and heavy EVs will be exempt from road user charges from September 1.

They're among rule changes announced by transport minister Simon Bridges.

The road user charges exemption has one rider – it will apply only until EVs make up 2% of New Zealand's heavy vehicle fleet.

August 10

Don't all power up at once

EV owners are being encour-

aged not to all power up their cars when they get home from work at around 6pm.

That could lead to a big jump in electricity demand and could see people paying more for it.

That's the message from Chargemaster, which says if all passenger cars were electric and everyone plugged in when they got home, peak power demand could jump by 35%.

ChargeNet wins award for innovation

Winning the Innovation in Energy Award at the prestigious 2017 Deloitte Energy Excellence Awards has delighted the ChargeNet NZ team.

Founded in early 2015, ChargeNet NZ has travelled across New Zealand and internationally to advance EV uptake.

It's grown a nationwide network to more than 50 fast charging stations, as well as developing a revolutionary software package for billing and managing the network.

August 11

Electric van the answer to "last mile" delivery?

New start-up Chanje, a California-based commercial electric vehicle and energy solutions company backed by Hong Kong's FDG Electric Vehicles, has unveiled its first product, a commercial all-electric van available at mass scale for the United States market.

The V8070 commercial panel van has an increased payload and cargo capacity and is equipped to haul up to 2750kg. The average urban delivery route in the US is around 100km a day, making "last mile" delivery a perfect market for electric mobility.

"We have an opportunity to meaningfully overhaul the last mile industry and completely revolutionise how that facet of transportation impacts the environment," Chanje chief executive Bryan Hansel says.

Tesla develops self-driving semi-truck

Tesla's long-haul electric semi-truck is set to be revealed to the market in September. Chief executive Elon Musk announced the truck's development in April.

Now it seems the truck will also be able to drive itself and move with others in "platoons" that automatically follow a lead vehicle.

Tesla is getting closer to testing a prototype, according to an email discussion of potential road tests between the company and the Nevada Department of Motor Vehicles that has been seen by Reuters.

August 12

National pledges to buy 5000+ EVs

The National Party has promised to make one in three vehicles in the government fleet electric or plug-in hybrid by 2021 should it be returned to power in the general election.

As the plan is a party pledge rather than government policy, transport minister Simon Bridges and climate change minister Paula Bennett released the news as party spokespeople rather than ministers. Bridges and prime minister Bill English publicly released it at the ChargeNet station in Lower Hutt.

"We already have an ambitious target of having 64,000 electric vehicles in New Zealand by 2021," Bennett says. "We want the public sector to lead by example so we are setting a hard target of 1 in 3 electric or electric hybrid vehicles in the government fleet by 2021."

August 14

Parties power up transport promises

NZ First and the Green Party are stepping up the rhetoric over vehicle electrification.

Making the government fleet totally zero emissions by 2025-26 is NZ First's

policy. Leader and Northland MP Winston Peters says it's likely the Government's EV announcement along similar lines was sparked by Official Information Act requests from his party.

NZ First will start transitioning zero emission vehicles into the government fleet by phasing out petrol and diesel, Peters says. "Excepting emergency services and the defence force (because of more challenging environments), this is a sizeable number of vehicles."

Funding for 15 EV projects

Fifteen projects to increase EV charging facilities and switch more trucks, buses and vans to electric have had funding announced by energy and resources minister Judith Collins.

The projects are covered under the Low Emission Vehicles Contestable Fund, administered by the Energy Efficiency and Conservation Authority.

The projects have been conditionally approved under the second funding round to receive \$3 million. Collins also announced the opening of the next \$3 million round, with applications closing September 27.

August 16

Charging electric buses on the go

A trial charging electric buses on their route has received a boost with a \$339,602 Energy Efficiency and Conservation Authority grant.

Tranzit Group will test the fast drive-through system, known as "opportunity charging", to demonstrate its viability with the possibility of extending it to cities and regions throughout the country.

The project will build a containerised 450kW opportunity charger with an overhead charge mast and associated vehicle-mounted equipment for one bus. It will give the bus batteries an additional charge

Continued on page 23

Continued from page 22

as the bus travels through the network. The system will be based at suitable locations such as bus stops.

Free EV fast charger opens in Pukekohe

Pukekohe has opened a free EV fast charger and another is coming shortly.

Counties Power officially opened the charger in the public car park beside Pukekohe Countdown supermarket.

It will fully charge a vehicle in about 20 minutes.

East Coast goes EV friendly

EV fast-charging stations will be built at six strategic sites around the Gisborne and East Coast area by Christmas, helping plug a big gap in the rapidly expanding national EV charging network.

Regional infrastructure company Eastland Group has been given a \$251,000 government contribution towards electrifying the East Coast section of the Pacific Coast Highway.

"This project is critically important," Eastland Group chief executive **Matt Todd** says. "It will further open up the region to tourists and encourage local uptake of EVs as they're a genuinely viable, cost-effective, low emission option."

State EV buying programme backed

An EV pilot procurement programme for the public sector should be run by the Government, a select committee says.

That will help determine how to have 64,000 EVs on our roads by 2021, the select committee investigating the future of mobility says.

Parliament's transport and industrial relations select committee has, after an 18-month inquiry, issued 14 recommendations for the Government to maintain a productive, safe, environmentally friendly, resilient and affordable transport system, *BusinessDesk* says.

New electric trucks for Palmerston North

Two new fully electric trucks will

replace two Palmerston North City Council diesels collecting recyclables and solid waste.

A \$350,000 grant from the Energy Efficiency and Conservation Authority's low emission vehicle contestable fund will allow the purchase of the purpose-built trucks and help towards charging infrastructure.

"This grant enables us to launch the transition to an electric vehicle fleet where it might not have otherwise occurred until the technology for medium-sized trucks is more established," council logistics and support manager **Paul Compton** says.

August 21

Home charging's easier

Electric vehicle owners find home charging reliable, dependable, cheap and more convenient than filling up at a petrol station.

That's the finding of a poll by Flip the Fleet, a community membership organisation which shares data on EV performance in New Zealand conditions and encourages EV uptake.

Members were invited to compare filling up at a petrol station with charging their EV at home on a one to five ranking, with one being much more convenient and five being much less convenient.

NZ Post trials E-vans

Five electric vans will be trialled by New Zealand Post, which has received \$131,250 for the purpose from the Energy Efficiency and Conservation Authority.

The vans will be assessed for their suitability for widespread courier use.

The new vehicles will allow courier drivers to see for themselves what it is like to drive an electric van so they can consider purchasing or leasing their own, NZ Post says. The vans will be used at courier depots and delivery branches around the country.

August 23

Electric vehicles to share spotlight

Electric vehicles will have their own category for the first time in the 2017 New Zealand Car of the Year awards.

EVs aren't new to the New Zealand Car of the Year line up with the BMW i3 taking top honours in 2015.

But this year organisers have created a new category to reflect the increasing numbers available and growing market interest.

Comeback for Kombi

Surfers and hippies rejoice – Volkswagen is bringing back the Kombi, or something like it anyway.

This version will be based on VW's electric I.D. Buzz concept vehicle which goes into production as "the spiritual successor to the company's iconic van", known in the United States as the microbus.

VW announced its decision during the 2017 Pebble Beach Concours d'Elegance in Monterey, California, because the state played an important role in the Kombi's history.

Kia Niro set for electric line-up

Kia Motors is the latest car-maker promising to have a range of electric vehicles available early next decade.

Kia and sister company Hyundai will together have 31 "green" cars in production by 2022. Kia says the all-electric Niro is the first of eight to come.

Included in the line-up will be plug-in hybrids, standard hybrids, hydrogen fuel-cell vehicles and pure battery EVs.

August 24

EV training steps up at Unitec

Training in EVs is fast becoming a major component of the automotive school at the Unitec Institute of Technology's Mt Albert campus in Auckland.

Now housed in a new

trades school building, the automotive training facility has about \$8 million in state-of-the-art equipment, much of it centred around EVs.

"Cars are now more computers on pieces of rubber, which is why we invested in this kit," vehicle systems lecturer **Lee Bagelow** says.

August 29

Electric BMW here early next year

The new electric BMW i3 and i3s models are expected to be available in New Zealand at the start of next year.

The exact timing, pricing and specifications have yet to be finalised, BMW Group New Zealand says.

BMW labels it the best-selling electric car in the premium compact segment. Improvements include styling accents, cutting-edge equipment features and new digital services. There's a new model variant, the BMW i3s, which has a higher output, model-specific chassis technology and more dynamic driving qualities and design features. ■

EVtalk

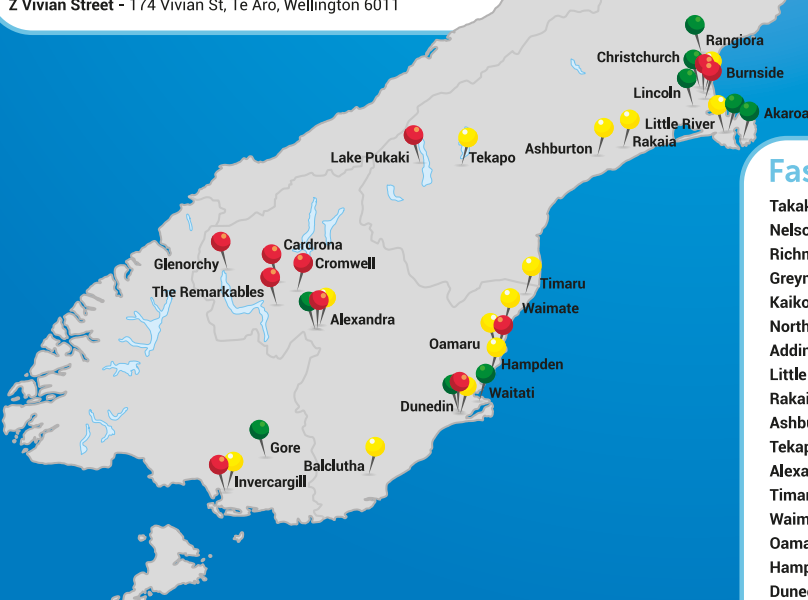
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NZs EV Charging Infrastructure

Fast Charger Locations – North Island

Kawakawa - 4 State Highway 1, Kawakawa 0210
Dargaville - 111 Totara St, Dargaville 0310
Tikipunga - Paramount Plaza, 1 Wanaka St, Whangarei 0112
Whangarei - Northpower Substation, 11 Alexander St, Whangarei, 0110
Raumanga - McDonalds, 130 Tauroa St, Raumanga, Whangarei 0110
Kaiwaka - 1 Kaiwaka-Mangawhai Rd, Kaiwaka 0975
Warkworth - New World, 6 Percy St, Warkworth 0910
Warkworth - BP Warkworth, 67 Auckland Rd (SH1), Warkworth 0910
Silverdale - Kings Plant Barn, 17 Hibiscus Coast Highway, Silverdale 1025
Kumeu - Kumeu New World, 120 State Highway, Kumeu 0810
Albany - 186 Don McKinnon Drive, Albany, Auckland 0632
Hobson St - 21 Hobson St, Auckland, 1010
Z Beach Rd - 150 Beach Rd, Auckland 1010
Newmarket - 1 Gillies Ave Newmarket, Auckland 1023
Greenlane McDonald's - 356/320 Great South Rd, Greenlane, Auckland 1051
BP Pakuranga - 322 Pakuranga Rd, Pakuranga Heights, Auckland 2010
Z Botany Downs - 550 Te Iirangi Dr, Botany Downs, Auckland 2013
Airport Shopping Centre - 400 George Bolt Memorial Dr, Auckland Airport 2022
Z Skyway - George Bolt Memorial Dr, Auckland Airport 2022
Takanini Village - 30 Walters Rd, Takanini, Auckland 2112
Pukekohe - King Street Carpark (Seddon Lane), 56-60 King St, Pukekohe 2120
Thames - 505 Mackay Street, Thames 3500
Tairua - Tokoroa Rd Carpark, 6 Tokoroa Rd, Tairua 3508
Te Kauwhata - 16 Wayside Rd, Te Kauwhata 3782
WEL Networks - 114 Maui St, Waikato 3200
Hamilton - Tesla Supercharger (x4), Te Rapa Rd & Warere Dr, Hamilton 3200
Ruakura - Waikato Innovation Park, 9 Melody Ln, Ruakura, Hamilton 3216
Raglan - 43 Bow St, Raglan 3225
Tauranga - The Strand, Tauranga, 3110. (BYO cable)
Mt Maunganui - Bayfair, 19 Given Road, Mt Maunganui Rd 3116
Cambridge - 73 Queen Street, Cambridge 3434
Te Awamutu - 10 Scout Lane, Te Awamutu 3800
Te Kuiti - New World, 39 Rora St, Te Kuiti 3910
Rangitaiki - Rangitaiki Lodge Café, 3281 SH5, Rangitaiki
Whakatane - i-SITE, 30 Quay St, Whakatane 3120
Rotorua - 1134 Haupapa St, Rotorua 3010
Taupo - 1 Kaimanawa St, Taupo
Gisborne - 21 Gladstone Rd, Gisborne, 4010
Turangi - 1 Pihanga Rd, Turangi 3334
Waiouru - State Highway One & Hassett Dr, Waiouru 4861
Te Haroto - Mc Vicar Rd, Napier-Taupo Highway, 4237 SH5, Te Haroto
New Plymouth - 66 Courtenay St, New Plymouth 4310
Waiouru - State Highway One & Hassett Dr, Waiouru 4861
Napier - 206 Dickens St, Napier 4110
Hastings - 100 Queen St W, Hastings, 4122
Mangaweka - 2 Koraenui St, Mangaweka 4797
Waipukurau - Civic Theatre Carpark, 34 Russell St, Waipukurau 4200
Palmerston North - i-SITE, The Square, Palmerston North, 4410
Otaki - 155-163 Main Hwy, Otaki 5512
Masterton - 3 Dixon St, Masterton 5810
Porirua - 2 Serlby Pl, Porirua 5022
Featherston - SuperValue, 42 Fitzherbert St, Rimutaka Hill, Featherston 5710
Upper Hutt - 24 Queen St, Upper Hutt 5018
Lower Hutt - Dowse Museum & Square, 1 Stevens Grove, Lower Hutt 5010
Z Petone - 60 Hutt Rd, Petone, Lower Hutt 5012
Z Vivian Street - 174 Vivian St, Te Aro, Wellington 6011



Fast Charger Locations – South Island

Takaka - 16 Willow St, Takaka 7110
Nelson - Millers Acre Carpark, 37-39 Halifax St E, Nelson, 7010
Richmond - Tasman District Library, 11 Mcglashen Ave, Richmond 7020
Greymouth - 13 Tarapuhi Street, Greymouth 7805
Kaikoura - 51 West End, Kaikoura 7300
Northwood - New World, 2 Mounter Ave, Northwood, Christchurch 8051
Addington - Z Moorhouse Ave, 40 Moorhouse Ave, Addington, Christchurch 8011
Little River - 4235A Christchurch Akaroa Rd, Little River 7591
Rakaia - Rolleston St, Rakaia 7710
Ashburton - 109 West St, Ashburton 7700
Tekapo - Tekapo 7999
Alexandra - 9 Thompson St, Bridge Hill, Alexandra 9320
Timaru - 26A North St, Timaru 7910
Waimate - 125 Queen Street, Waimate 7924
Oamaru - Eden St Carpark, 3 Eden St, Oamaru 9400
Hampden - 33 Lincoln St, Hampden
Dunedin - Filleul St Carpark, 193 Moray Pl, Dunedin 9016
Balclutha - 23 Charlotte St, Balclutha 9230
Invercargill - 116 Esk St, Invercargill, 9810