

Driving Net Profit with Zero Emissions Show

Reducing transport emissions with EVs and hydrogen

Introduction

Patrick Denvir:

You're listening to the "Driving Net Profit with Zero Emissions" podcast, a monthly show with best-practice net-zero stories of leading businesses responding to climate change, with 100% Renewables Co-CEO Barbara Albert.

Barbara Albert:

Hello, and welcome to this latest episode of the Driving Net Profit with Zero Emissions podcast. I'm Barbara Albert, co-CEO of 100% Renewables, a consultancy specializing in the development of net zero strategies. The urgent need for society to drastically cut its emissions of greenhouse gases is highlighted in the first two of the reports of the IPCC's Sixth Assessment Reporting cycle. The Working Group I and Working Group II reports highlight the need for deep cuts to be made to emissions in the next seven years if we are to have any chance of avoiding catastrophic climate change. They also highlight the vulnerability of both ecosystems and human systems to the changes that are already happening. In Australia, we finally seem to be on the verge of real breakthroughs that will see our electricity grid decarbonize in the next couple of decades is highlighted in DISER's October 21 report and emails draft 2022 integrated system plan.

Barbara Albert:

And rooftop solar remains popular with homes and businesses with around 30% of dwellings now having solar, but there remains much to do to decarbonize Australia's economy with transport, gas combustion, industrial, agriculture, and fugitive emissions, waste and land use all playing important roles in our overall emissions picture.

Barbara Albert:

Today's topic is about reducing transport emissions, transport emissions account for roughly 19% of Australia's emissions, making it the third largest source of emissions. Today, we will be talking about our power transport sector and how we can shift from fossil fuels to cleaner ways of transporting people and goods such as electric vehicles and renewable hydrogen. Course active transport is also a big part of the decarbonization of transport in our cities and towns and we aim to have a future podcast that focuses on that aspect of mobility.

Barbara Albert:

For this special podcast episode, I'll be interviewing three people with significant experience in the transport sector, coming from the car manufacturing perspective, the policy perspective and the motorist's perspective joining me today is **Scott Nargar, David Malicki and Nikesh Murali**. **Scott Nargar** is the senior manager of future mobility and government relations at Hyundai Motor Company, Australia. Scott has over two decades of experience in the motor industry in technical, media, product planning and technology

advocacy roles. For the last 10 years, Scott has been working for Hyundai in senior technical management, product planning, environment and government engagement policy roles. Scott leads the company's hydrogen fuel cell electric vehicle project and future mobility programs. Scott was the co-founder of the Australian Hydrogen Council and is currently a member of its board of directors.

Barbara Albert:

David Malicki is the team lead net zero transport at New South Wales Department of Planning and Environment. His team is responsible for delivering \$330 million in initiatives under the New South Wales Electric Vehicle Strategy and the New South Wales Net Zero Plan Stage One. He is an experienced business team lead with a demonstrated history of working in the environmental services industry. He's skilled in government procurement, environmental issues, sustainable business, management and building effective relationships.

Barbara Albert:

Nikesh Murali is a senior policy advisor at the NRMA specializing in electric vehicles, future transport and low carbon technology. Prior to the role at the NRMA, he worked as a policy advisor in the Australian Federal Public Service on policy initiatives in transport, future mobility, maritime, and airports and aviation. He has an interest and expertise in shaping and promoting the visibility and opportunities created by transitioning to net zero emissions in the transportation and energy sectors.

Global trends/big picture

Barbara Albert:

Hi, and welcome to the Driving Net Profit with Zero Emissions podcast. Scott, David, and Nikesh, it's fantastic to have the three of you here today on my show. **I wanted to start interview with asking what the trends in the future of transport, how do different fuel types play a part of, for instance, hydrogen, electricity, biofuels? Is it all of these and will it depend on the needs of different modes of transport like cars, trucks, buses, trains, ships, and planes?** If I can briefly go to each of your in turn, starting with Scott.

Scott Nargar:

Great question and I think the technology and all the technology mentions are all complimentary so from a Hyundai Motor perspective, we have a range of electric vehicles, hydrogen fuel cell vehicles, hydrogen buses, trucks, hydrogen trams coming off production line now, and we also build ships so we've got a whole portfolio of everything that's going to be needed for the future from whether it be road, transport, rail, or marine and it's really looking at how that technology's used. So the heavier the platform, hydrogen fuel cells going to come more into its own and the lighter the platform it's where we see EVs being a really good replacement. So think about probably the best way to think about it is EV is going to replace petrol and fuel cells is going to replace diesel, that's the best way to think about the technologies and the platforms.

Barbara Albert:

What about you, David?

David Malicki:

Yeah, I'd agree that all of those fuel types you mentioned will play a part in the transition to lower zero emission vehicles in the future. It's a fair bit of kind of crystal balling to know which of hydrogen or electricity will ultimately succeed across the different categories and there are different players in the market with different offerings in place and investigating and researching and building against those different fuel types.

David Malicki:

At the moment, most, as Scott kind of alluded to, most commentators will be saying that in the light vehicle space, passenger vehicles use LCVs that electric vehicles have won that race and that's for a few reasons. There's some challenges with the cost and the efficiency of hydrogen vehicles. They're not selling terrifically compared to electric vehicles in Australia, it was around 40 hydrogen passenger vehicles last year compared to around 20,000 EVs but the refueling infrastructure is probably the key point with lighter vehicles.

David Malicki:

Every wall socket is an electric vehicle charger, so there's tens of millions of those across Australia, of course, in every building whereas governments are starting to invest in hydrogen refueling infrastructure, but states are focusing on the key freight routes in terms of building that.

Barbara Albert:

So what is your view? Nikesh?

Nikesh Murali:

Yeah, I echo David's sentiments. There's, what, 20 million passenger EVs, 1.3 million commercial EVs and about 280 million electric mopeds on the road now. Pretty much everything that moves, bikes, scooters, cars, forklifts, trucks, buses and agricultural equipment are all being electrified so I'll repeat my oft repeated mantra that future is electric for those sectors and obviously, like David mentioned, lots of supporting factors, OEMs bringing in electrification targets, there's rapid deployment of chargers by governments because of the commitments to its net zero targets. Companies like Amazon and DHL are pledging the purchases of thousands of electric vehicles so again, that mantra, I think, electric is future holds true, but hydrogen has a very important role to play with shipping tracking and aviation.

Nikesh Murali:

Unfortunately for biofuel, I think there's only like 3% transport demand for them and I don't think they're on the trajectory to attain net zero targets and part of this is because you have to mix them with fossil fuels to achieve any kind of use currently. There's also some argument around the fact that with the kind of biofuel feedstock demand, they actually might have higher GHD emissions, greenhouse gas emissions and also because of all the factors that I said before, it requires a substantial market intervention or subsidies which I don't think there's a lot of policy appetite for that, so that's where biofuel sits, but pretty much echoing everything that David and Scott have said previously.

Barbara Albert:

I just wanted to bring up this point that Scott mentioned previously that basically all petrol powered vehicles are going to be replaced with EVs and diesel is going to be replaced with hydrogen. Do you agree with Scott's view there as well?

David Malicki:

I might jump in on this one, Barbara, I think there's some electric offerings in the heavy vehicle space already being conceptualized and tested and built by some organizations and there's some hydrogen options being built in that space as well so there's a lot in the roll out of the refueling infrastructure, both electricity and hydrogen refuelers as well as a range of factors, both economic and I guess a social license operate and so forth in these different segments. There's no one answer yet, I don't think.

Nikesh Murali:

Yeah, but I think broadly Scott's logic is accurate. It's a good way to start thinking about how that transition's going to happen, but David's right. it's very much dependent on so many different factors would be, we really can't nail down with the trajectory as yet.

Scott Nargar:

And the markets themselves are going to determine that so it's the practicality of the technology. If you need something that fills up very quickly and do very long distances and carry heavy loads, then it'll more than likely be hydrogen but if you can have the truck or the bus or whatever it might be charging for a bit longer and you don't need to do those rapid fills like line haul would need a rapid fill, then a electric truck would be perfect for that. Note that four and a half ton to six and a half ton truck, we're already starting to see electric trucks here in Australia now and it's really looking at where we head to with that heavy stuff and then we head all the way out to from line haul into heavy, heavy rail and then agriculture and then heavy mining and then shipping.

Scott Nargar:

So that's where we'll probably see more fuel cell than battery, but the technology is complimentary so much technology in our hydrogen fuel cell Nexo that came out of our electric Kona EV so the electric motor in both vehicles is the same part number. The control systems are the same part number, the 64 kilowatt hour battery in Kona EV is the battery we use in our electric and hydrogen fuel cell buses or trucks so it's complimentary technology with a lot of shared components and as we move to, from a Hyundai sense, with our IONIQ 5 as the first car that rides on the Hyundai Motor Group's E global modular chassis and then you've got IONIQ 6 coming this year, the Genesis is either coming this year and Kia's EV6 all run on a shared chassis which is going to ensure that we have more consistency, less complexity during manufacturing, and hopefully reducing the cost and getting the cars down to parity.

Scott Nargar:

And it's all about getting parity and a big one is building an infrastructure, it's huge and it's not doing it well in Australia when it comes to EVs and it's a lot harder with hydrogen fuel so we need to plan in the country and what we are really hoping from and post is the federal action that's just been announced, there's really strong federal leadership in this case and consistency across the states. There's some amazing stuff being done and especially with David's government, New South Wales government, ACT had some amazing things as well. As a global car manufacturer that sells cars in every state territory in Australia, we love to

see consistency and have all the other states climbing up to the bars that were set by the New South Wales government and hopefully exceeding them so it's something that we're really happy to see, but it's just getting that consistent infrastructure across Australia for both the EV and fuel cell.

Hydrogen fuel cells vs. standard electric vehicles

Barbara Albert:

Yeah. So definitely infrastructure is super important, but what is the advantage of hydrogen fuel cells over to standard electric vehicles?

Scott Nargar:

The biggest one at the moment is the charging, so we can charge the Kona and Nexa in three minutes and do over 660 kilometers. Even the fastest car in the world now, which is the IONIQ 5 and the Porsche Taycan, they're going from 10% charged to about 80% charge in about 16 minutes at the [inaudible 00:12:48] to 350 kilowatt charge so we're still not at that point of charging a hydrogen fuel cell car, whether it be the Hyundai, Nexa or the Toyota Mirai, but the technology's getting there and emerging as we move to new tech battery technologies and solar state batteries, and even faster charges, we'll see things evolve and the technologies combined.

Barbara Albert:

Yeah, it's still an evolving space. So who's actually leading the race? 'Cause I hear a lot in the news about Tesla as a manufacturer, for example, about Norway as a leading country where, at the beginning of this year, 84% of new car sales were electric, is this actually a true reflection of what's happening in the marketplace? What about other modes of transport or other manufacturers or even other countries?

David Malicki:

I'm happy to start the answer on this one. I might split it into talking about the car makers and then other jurisdictions around the world. So firstly, on the car maker front, in Australia, you're right, the Tesla's sell 60%, I think, of Australia's EV, something around that mark currently to date, but more and more offerings and models are becoming available right across the different brands and so that's expected to change over time as other car makers tool up to be building electric vehicles. Car makers, I suppose, new car makers building from the ground up, have an advantage around their only building starting to build EVs. They don't have a historical manufacturing lines, bureaucracy, supply chains to change so those of the likes of Polestar, of Rivian, of Tesla and so forth, but they're small to begin with as well, they're startups essentially and so the incumbent car makers who are making already millions of vehicles a year have the advantage when they tool over that they're extremely experienced in building cars and shifting over and having gigantic global supply chains.

David Malicki:

But that being said most, if not all of the car makers have got targets in place and they're setting targets around no longer designing or building internal combustion engine vehicles at certain points in time, they're all a bit different, but there's lots of commitments being made out there. And there's tens of billions of dollars of investment into both the manufacturing side of things, as well as the research around battery technologies and hydrogen and the different chemistries and so forth that are available.

David Malicki:

And then moving on to countries, yes, Norway's the leading light in terms of sales uptake and they've done that through using a lot of the levers of government to bring the price down, to be close to parity with internal combustion engines and that's a clear indication that that does work, but Europe is probably the leading continent around EV uptake and that's probably down to their strong fuel efficiency standards and penalty regime, credit regime around the emissions efficiency of vehicles that are sold into Europe.

David Malicki:

And just in the last couple of weeks, the European parliament has legislated, I think, for the no more sales of electric of internal combustion engines by 2035, I believe that is, but there's other jurisdictions around the world that are also very strong, progressive and proactive on the shift to zero emissions vehicles so you look at a place like China or the USA as an example, and particularly big states like California and New York, significant investment into the charging infrastructure incentives to encourage early uptake and sales bans and so forth so it's a global phenomenon just happening as at different paces in different locations.

Barbara Albert:

And what about Nikesh?

Nikesh Murali:

Yeah, look, David's kind of presentation of the global spread is accurate in that it's Norway, as you pointed out that's, and Scandinavia as a whole that's leading in substantial uptake of hybrids and EVs, Europe and China lead the way, I think they've got 16 and 14% market share. I think next comes US at about 4.5% and I think that one's electric use become easily manufactured then you'll see the adoption rates and they pickup.

Nikesh Murali:

Obviously, Tesla's had a significant advantage, but as David pointed out with the various individual targets that the companies have set, the OEMs have set, some of the estimates show us that by 2025 Volkswagen is likely to lead the race but and everyone's playing catch up very quickly and I think in terms of sales numbers, as we've previously spoken, it's passenger EVs that I've got the bulk of the sales, but electric buses come very close by. There was high demand in 2021 for medium and light commercial vehicles. We are seeing increased registrations for electric buses and business and commercial vehicles over the last two years. I think that with increased commitment from a lot of the manufacturers in that sector, like Daimler and Renault and Scania and Volvo, even though commercial vehicles are sitting at one third now on the ranking table, it's playing catch up fast but I think broadly the trends that David talked about is exactly how it's progressing.

Scott Nargar:

And all manufacturers have to do it. We don't have a choice. So emission regulations around the world of driving change, which I think is a great thing but as a global car manufacturer, we also need to sell a lot of the current vehicles to pay for the R&D for the future vehicles and we've been doing R&D on electric and hydro fuel cell vehicles for over 25 years and having 65 plants around the world, we need to ensure that those plants and different markets and the plants providing for different regions around the world and

most of ours come out of Korea and some from Europe. Our European plants that we have the right technology in the right place, one to meet emission regulations to also meet consumer choice, you've got to make sure you're building things that people want to buy, the car's attractive and everything else is what they need from the practicality of the car, the safety, the technology with inside the vehicle as well, and then package it in the way that's affordable.

Scott Nargar:

And the technology is not cheap at the moment for any car manufacturer and no one's at parity just yet although everyone's working hard for it and things like global modular chassis can be used from a Hyundai Motor Group perspective across Hyundai, Kia and our Genesis brands really helps a lot. The other big one is really ensuring that we have in place the supply chains. The biggest thing with anything is supply chains, ensuring you've got the right resources so from a Hyundai perspective, everything's built out of our Korean plants, 100% Australian steel, and you'll see a lot of battery technology and resources coming out of that will be Australian as well so very proud to say anything that's coming out of Korea, whether it's a train, ship or a car or a truck is our steel, but then you can look at those other resources and they come from a number of places around the world.

Scott Nargar:

We are blessed for a lot of resources here, but there's a lot of countries that also have and that we've seen disruptions in the last couple of months with the issues in Europe and the war in Ukraine about supply chain, not just for resources for vehicles, but also resources for energy grid so there's a big evolution here. Everyone wants independence and in Australia here, we certainly want energy independence when it comes to our transport fuels, but also we want to ensure we've got the right supplier of minerals coming for our vehicles.

H2 Market in Australia

Barbara Albert:

Yeah, for sure. What does it look like in Australia? I hear a lot about these supply issues, but what's the uptake here in Australia in the passenger and SUV space at what rate is it growing?

Nikesh Murali:

I think the Electrical Vehicle Council reported that the sales last year was three times from the previous year so demand is extremely high. Overwhelmingly, we are seeing that the trends are for the fast back format or the SUV format. I think cars like Volvo XE40, the Polestar's, Hyundai Kona, they're selling really well. The Benz's is a few SUV models like EQC, EQA that are really selling well. Utes, as you know, make up 20 percent of the market here in Australia, very popular, but obviously we don't have a lot of vehicles coming in that arena, but they are coming soon. So there's Ford F150s that are coming out in mid 2023. LDV T60s, DWM Ute, this is some of the names that I can remember, there's a new BMW IX, it might already be out so as you can see, fast back and the SUV format's very popular, but also these new Utes are coming.

Nikesh Murali:

Big players like Toyota, which makes the Hilux, which is the dual cab segments, they haven't... Even the Toyotas surging forwards in their terms of their electric journey. I haven't heard much in terms of commitments on when we will see those popular dual cab segments expand, same with VW Amarok, there's this electrification plans, but no solid commitments and there's of course the Tesla cyber truck so it'll be interesting to see all those popular vehicles enter the market fairly soon. What's interesting though is that I think with the Ute, it might be the boutique manufacturers that might get a head start over traditional OEMs, if, based on what we know now, because things could change in a matter of months, but I think Rivian's of the world might make an entry. I even read recently about a company called OSMV and Atlas Motor Group, I think they are importing right and left hand drives, and then converting it in Queensland and selling them so it'll be interesting to see who the boutique players are as well, who will contribute to the expansion of the Ute segment when it comes to EVs.

Barbara Albert:

That's a really important thing for Australia, because we do like our big cars.

Nikesh Murali:

Absolutely that'll change the narrative a lot, I think. It's already changing. You can tell from the demand that the narratives already changed, but that segments expansion will significantly change the narrative.

David Malicki:

I'd say absolutely and model availability is a huge thing because consumers decide based on the fit for purpose nature of the vehicles, the kind of vehicle they want to drive, they need to drive and then they choose the other features around that vehicle and part of that is whether it's electrical or petrol. That tripling of sales of EVs last year that Nikesh mentioned, absolutely true, it's great, it's the start of that curve, that hockey stick curve up to full electrification of the fleet over time, but we are moving off a low base in Australia. So last year we're still at 2% sales being EVs and you compare that to that Norway stat that you talked about before over 80% already. In New South Wales, we have a sales ambition or target with our New South Wales Electric Vehicle Strategy and the intent is to accelerate the uptake of electric vehicle so that we're at 52% of new car sales being EV by 2030 and the vast majority by 2035-

David Malicki:

... Our sales being EV by 2030, and the vast majority by 2035. That's based on a whole lot of modeling and our ambition to accelerate that transition in New South Wales. And it's really important because vehicles stay on the road, we know, 10 to 15 years. That's their on the road life. And so to have all sales being EV by 2035 is quite critical to achieving a net-zero target by 2050.

Scott Nargar:

And that's one of the big benefits, I suppose, where we see that. We've got clearer targets coming up from government. What we are looking forward to is a mission regulation, which we touched on earlier. As a vehicle manufacturer we send the bulk of our electric vehicles to countries where we have the biggest financial liabilities. So we're going to send a lot of cars to Europe and to California and into the Korean market and other places where there are incentives, consumers who take up those vehicles, but there are also penalties for manufacturers that don't have it. Under the corporate fleet averages, you need to have a

percentage of vehicles being zero emission to offset the other ones as we transition away from internal combustion here.

Scott Nargar:

We don't have that here. The one benefit we do have from each Hyundai center is that everything we have overseas for zero emission vehicles, we have here in Australia. We just don't have the volume to satisfy the demand. The demand for IONIQ 5 is phenomenal. We're going to see the same thing this year with IONIQ 6, next year with IONIQ 7. And we've got three Genesis EVs launching this year. In fact, our Genesis brand goes 100% zero emission, whether it be fuel, solar, or EV by 2025. So, that shows you how quick we're moving in one part of our portfolio.

Scott Nargar:

And obviously Kia, the other part of our brand, have got their own targets they're setting. But we have our own net-zero emission targets within the Hyundai Motor Group, from the production, from the shipping. We own our own shipping liners. We've got our own ships, so we've got that vertically integrated network, from supplying all the parts and right through. So we can control a lot of our destiny.

Scott Nargar:

We are working very, very hard. There's some big announcements about new hydrogen fuel cell factories in Korea and in China. We're building new EV production plants. One just opened just a couple of months ago in Indonesia, another one coming up in Singapore. And the big announcements in the last couple of weeks about the big EV production plants and battery assembly plants in the US, supported by the US government.

Scott Nargar:

And it's not just Hyundai. All manufacturers are doing this because we're all battling the same emission regulations. And it's not a battle, it's something that we were all asking for. In Australia, we've got the Federal Chamber of Automotive Industry. We have the voluntary emission regulations in Australia. It's something we're doing ourselves, and naming and shaming ourselves. We don't penalize ourselves, but really we want government to adopt that and really focus on getting zero emission vehicles here.

Barbara Albert:

That's great. And you mentioned the new factories that are being built. But what stage of development are fuel cell EVs at, in terms of commercialization and uptake? Or what role or market segments do you expect it will play a role in going forward?

Scott Nargar:

Yeah, well, the vehicle like ourselves and Toyota have vehicles here at the moment in a number of markets around the world and they're going well. We do about 10,000 loads each year in Korea, another 10 to 15,000 that covers the other markets around the world. Still a fraction of what we make globally and a fraction of the global car market. The biggest thing there is infrastructure. I've got a lot of customers, a lot of pent up demand on Australia. I've just got nowhere to field them. So we've maxed out the ACT station

the day it was commissioned. We're expecting the Queensland government Hydrogen station and the ATCO gas Perth station in Jandakot to come online in the next three to six months.

Scott Nargar:

And then, we'll continue to work with David and all the teams across the New South Wales, Victorian Queensland governments for the networks. From a truck perspective, they're on the road, they're in Switzerland right now, because there are a lot of incentives that have trucks on the road. There's massive penalties for internal combustion trucks per thousand kilometers, and actually makes it really beneficial to have those trucks in that market and the economics work out. In other markets, you don't have those incentives. So the cost between an internal combustion truck and hydrogen fuel sellers are still very different. And that needs to be sorted out. We need to get the trucks down as cheap as possible, as soon as possible, but you've also got to make sure that they're practical. They're drillable, they're doing the same lows. They're filling up very quickly.

Scott Nargar:

And that's where we kind of see at a certain point, batteries will be used up to a certain point and then, and then fuel cell from then on. But, there's companies here in Australia that've done battery swap out trials in trucks recently, which for myself being a technology advocate and before Hyundai spent 10 years at NRMA writing about technology and testing it, looking at it. I just love seeing technology. I don't care what brand it's from, let's just get the technology here. There's so much pent-up demand in this market that all manufacturers that bring vehicles here will do very well. And we encourage it. We want more competition. We want to see more competitors here, especially with light electric vehicles and affordable electric vehicles.

That's going to drive consumer awareness, consumer consideration of purchase. And then when that happens, you're going to see more politicians become more aware of the changing nature or consideration of purchase requirements for consumers. And they're going to put a lot more policy in place, more money in place to support that. It's already happening to a degree here in Australia, as we said, NRMA and New South Government are doing a great job in this area. We want to try and get rest of Australia up to those same bar and move the whole country forward at once.

Nikesh Murali:

Yeah, I'm glad Scott got brought up that point about Korea because I think the real success story there was that they did set up targets. And the result of the target was that in 2020, they had about 10,000 FCVs on the road. And I think they have a 2040 target for about 3 million FCVs, most of them domestically manufactured as well. So, I think having those targets really help. And I think what's happened recently is with the trucking and delivery companies wanting to adopt hydrogen. So vehicles, I think, that's going to drive some kind of target in the near future, but yeah, very important.

Scott Nargar:

One of the best things we spoke about the scalability and the modular platforms. When we look at hydrogen fuel cell, we use one 90 kilowatt stack in the Hyundai Nexa. In our buses, we use two of that exactly the same stack. In the trucks, we use three of them. In a large truck, we use four. In a stationary fuel cell to help with power generation and maintaining frequency in the power grid, we use two or four or six.

It's that same part. In our ships, we'll have them stacked up 10 tall and have potentially hundreds of modules of those stacks in a ship and relying on bunker ammonia or bunker hydrogen, not bunker oil.

Scott Nargar:

So that technology goes from the car to the bus, to the truck, to the train, tram and to the ship or stationary fuel cell. So it's that same part number. It's the same box. And there's no moving parts inside that box, which is really awesome.

Barriers for EV in Australia

Barbara Albert:

So we've heard earlier that you see one of the main barriers in the market being the available infrastructure and consumer awareness, but I was wondering, what are most of the key barriers to electric vehicle and fuel that electric vehicle uptake in Australia? Because, obviously it's such a good technology. It saves so many emissions. So why aren't more people and businesses switching to electric vehicles?

David Malicki:

I'd say there's three key barriers. And they're common, not only in New South Wales and Australia, but globally in every jurisdiction that's trying to shift to electric vehicles. And, those are price, their choice and their range anxiety, or the availability of public charging infrastructure. All those three combined, it's different for different people and different organizations might fulfill one of those barriers more than another, but they all come into play a little bit. And that's where jurisdictions are really laser focused on overcoming those barriers with upfront price incentives, with building out enabling charging infrastructure and encouraging the new models into the country. Although that's a global phenomenon, and we're seeing that shift quite quickly across the global car industry.

Scott Nargar:

What we mentioned about the global shift, we are seeing from some car manufacturers, it hasn't impacted ourselves is yet too much, but some car manufacturers are really struggling to get the internal combustion engine they need for certain markets around the world. And Australia is one of those and a lot of the European manufacturers, our fuel quality here is really not good. And a lot of the most advanced engines in the world, your lean-burn and JeGO engines struggle to run on the fuel here.

Scott Nargar:

So people aren't building really efficient hybrid or plugin hybrid drive trains with an older style conventional internal combustion engine. They're going to be teamed up with a lean-burn JeGO engine and be really, really efficient, but those engines don't run on the fuel here. So we've got a great opportunity to almost leapfrog that transition. We know that fuel quality is going to change here in 2026, 2027, and things will evolve there.

Scott Nargar:

But I think by then, under the current federal and state governments, I think we're going to see a shift happening before that change. We're going to see a lot more EVs come here. But the big one is key, as

David said, we need consumer choice and we can't build everything that consumers want. And people align with different brands for different reasons. We really want to see more affordable EVs here in the Australian market for us to compete with. And we're happy to put our cars head to head with anyone's car. If we can encourage them to come here, whether it's through competition or whatever it might be, bringing cars here, there's a place for them, there's a market for them.

Scott Nargar:

You probably have the same problem we have at the moment. We will sell out and have more unhappy customers that can't get a car rather than people that can't afford one. The market's in a good place at the moment, but the biggest drama, which can't get the volumes of anything, whether it's ours, Tesla's, Nissan's, the MGs, everyone's struggling with that volume at the moment to meet up that pent up demand, which is awesome. And that's happening because of the work by people like the NRMA and the New South Government who have put the awareness campaigns in place, the incentives and policies in place.

David Malicki:

And there's an observable phenomenon which is every new electric vehicle model that becomes available in Australia and the order books open, thousands, if not tens of thousands of orders are made within weeks.

Nikesh Murali:

I think Scott has the record there, doesn't he? I think IONIQ sold out in five minutes. Is that correct, Scott?

Scott Nargar:

Yeah, generally 4 to 5 minutes is the sell out time. And I think there's about 18 to 20,000. It was well over 20,000 at one stage of expressions of interest every time it comes up. It does hurt us and it hurts staff to see that there's so many people that are disappointed every time, those couple of hundred cars come up, but it's just the nature of what it is. It's the process at the moment. That's the direction we've gone. Other manufacturers are doing different ways of distributing vehicles, but it's so hard when you've got such a small volume of vehicles to get the right color, the right drivetrain combination, the right battery size across one of the seven ports in Australia. And then one of the 175 dealers across Australia to make sure the right kind of relocation for the right customer. So for ourselves at the moment, coming down this route is the way to go. And other manufacturers are doing different things, but you're going to see that whole environment evolve as well. And things will change in the future.

Nikesh Murali:

I just want to talk a bit about what you pointed out Barbara, in terms of uptake with the residential charging in particular, because it's a matter close to my heart now because we are trying to buy a property. And, one of the questions we ask is about EV charger availability in the apartment blocks. And I think that's a key kind of barrier and globally the kind of the acceptable policy around that is that there should be 100% charging in residential complexes for EVs and about 10 to 20% in commercial buildings.

Nikesh Murali:

But obviously, there are issues in Australia around that. Urbis, I think that's how you pronounce them. They're a consultancy who did a report for the ACT government, and they were talking about great reluctance among building managers and stratas to put charges in there. The report talks about lots of benefits, greenhouse gas emissions reductions being at the top of it, but also rental increases for properties where we would actually be able to provide a charger and definitely capital uplift for the building as well if that's provided. There is some work being conducted at the moment by the Australian building court board, I think it's coming out midyear, which will enable it easy to retrofit some of the buildings and take away some of that pain.

Nikesh Murali:

But, I think the New South Wales government has got a lot of wonderful resources for stratas, which I'm sure Dave will be happy to talk about, that gives them guidance on how to facilitate the process, whether it's retrofitting or whether it's new planning controls for new buildings. So I think that's very key because when you talk to people about EVs, generally in a barbecue chat, they always say, oh, I'm not really sure I have charging in my building or whether my stratas is going to accept that. And I'm not sure what the costs are going to be. So that's very important to be addressed that. So not just our building controls, but make sure that's implemented and then obviously support building managers and stratas with it.

Barbara Albert:

Nikesh, 100%. Are you suggesting that every unit in an apartment block has a charger available?

Nikesh Murali:

Ideally, because that is the policy standard. So we should work towards that. So my go to is David's the New Zealand government's page to try and understand what those resources are that enable stratas to make that call. David, did you have more insights on that with the...

David Malicki:

Yeah, look, it's a really important point because 70% of Australians across the country have access to off street parking. And that includes within strata buildings or detached homes, and that's where most charging occurs. So it's really important that charging availability is in these buildings, but we have at the same time, thousands of buildings that need to be retrofitted to include the electrical infrastructure to provide charges within those buildings.

David Malicki:

Well, it's a new space, right? So buildings never had to think about it before, but increasingly they're getting asked the question, I would like to buy an EV, I have an EV, how do I charge it in my building where I'm a tenant or an owner? So that question is coming up more and more. There's just been a lack of information or guidance around what to do, how to do it, what the costs are and so forth.

David Malicki:

So in New South Wales, we identified that information gap. And as Nikesh said, we've got a suite of resources, a toolkit, as you were, which talks through what the different options are for building out electric vehicle charging infrastructure, within buildings, both commercial and strata buildings, a costing

calculator, because understanding the cost estimate of what this is important to build a backbone electrical infrastructure within a strata building with about 100 car parking spots can cost around \$100,000 dollars. So it's what needs to be thought about by stratas and considered within their sinking funds.

David Malicki:

But there's also lots of templates to go to market, to find contractors, to have model and template bylaws that stratas need to put in place to enable it. And so that's all on the retrofitting front. It's going to increase in interest and importance as we progressed. And then as Nikesh mentioned, at the national level, the national construction code this year, there'll be requirements put in place for new buildings to have to install that electrical infrastructure, to allow for charges to be put in place down the track. So, yes.

Nikesh Murali:

I suppose this is where, what the New South Wales government is doing as we wait for this transition to happen, because of its expense and then the duration over a long time, I think having charges every five kilometers in residential areas with limited off street parking, I think that's really going to come into play and assist people for the uptake as we wait for this transition process to happen. So that's really beneficial.

Scott Nargar:

There's also that evolution of charging. And, we had at one stage had more EV charges here in our site in Sydney than anywhere else in Australia. We had 26 AC and then DC and hydrogen station, but we went through a lay cable trade through two basement levels of our building here and did pay an absolute fortune. But we do have room to put a couple hundred EV charges down there now, because the cable trades have been let and done. But to do that during the construction phase, would've been far cheaper, far easier, and all our charges and network controls, we can load balance and load shift and protect the building and keep the lights on and the heater going when everything's charging, we're producing hydrogen here.

Scott Nargar:

So we're learning as we're going on as well. I think that whole education piece is critical. It's not just know how do building managers and how to strata people understand what the tech is. Because it's all too hard, they don't want to know about it. It's easy to say, no, we don't do it. Go away. We see the same thing as we shift the conversation towards business fleets. Now, our business fleet manager's been so used to over the years of ordering a new batch of 20 Hyundai i30s, here's your ampoule or BP fuel card. And off you go, you do the job and they know what the insurance is.

Scott Nargar:

You've got to think about home charge and you've got to think about reimbursements and there's some great solutions and ways to get around that. And we were on a drive day recently with Origin Energy in New South Wales, and also think it was part funded by the New South Government. And they had a great example of the uniting care fleet manager came along and said, I have a whole lot of the EVs with our staff that do the home care for elderly people. And, they've got to the point where they can reimburse their staff on a weekly basis. They're actually getting to the point and working on it and not far off, but where they can reimburse their staff nightly at any [inaudible 00:41:48] to charge the vehicle at night.

Scott Nargar:

The technology's there. It's just a matter of adopting that technology and making people aware of it, whether it's the fleet managers or the strata people that it can be done. And there's plenty of good people around Australia that can help. We could probably name a dozen companies, which we won't hear that can help today, but there are some great examples of tech that's been used and we're not leading here in anything, it's been done overseas and the US and Europe and Korea in Japan for a number of years, it's just picking up the technology when it's most mature and adopting it here in Australia. And a lot of that's to do with just getting the basic education out there first.

David Malicki:

Spot on. That integration of vehicles into the grid, I think we've mentioned the load management. That's really important because of building, managing the charging, ensuring that it's orchestrated between the different charges and charging's happening in off peak periods and so forth, means that the supply side grid supply of energy doesn't even need to be augmented in most cases. It can be managed through smart controls and they can be linked through to air conditioning systems and other large loads within a building. And that's quite critical to think about that load management and integrate the electric vehicles into those buildings really efficiently.

Scott Nargar:

Yeah. Even with our smart chargers, our cars and assuming our competitors cars too, you can go home and plug in when you get home and you can set the car within two taps to the screen to start charging at nine o'clock at night or 11 o'clock at night, or when there are off peak cuts. Because you're going to be paying the best on the lowest rate of electricity for your vehicle if the cars home during the day that you want to start charging at 10 o'clock in the morning when you've got the most solar penetration on the house. So there's great tech in the cars. There's great smart controls and meters on the market now and more coming.

Scott Nargar:

If we look at, I suppose, we're not going to get into a big grid energy security conversation here, but the tech and the vehicles in the future, we've got 64 kilowatt hour batteries now. Now, future cars have 90-plus kilowatt hour batteries and so our competitors. Once vehicle off the grid comes along in type two CCS, the common plug we'll have used in Australia, what a great technology to help maintain frequency, our grid, and be able to manage high, low frequencies in periods.

Scott Nargar:

Yeah, in this energy crisis, we're talking about this week in a couple of Eastern states in Australia, everyone thinks the vehicles are going to impact that, but actually we'll be able to help deal with those events in the future, if they're charged at the right times.

Nikesh Murali:

It'll be the birth of the real [inaudible 00:44:16] in vast numbers. So, that'll be incredible.

David Malicki:

Absolutely. And the Australian National University estimated that if all vehicles in Australia were electrified, it gives us the storage capacity of five Snowy Hydro 2s. And, that's distributed energy assets as well. So, each of these electric vehicles with the battery capacity Scott mentioned, can power the average home for 2 to 3 days. An entire home for 2 to 3 days off the vehicle, as well as being a vehicle. So the opportunities are quite limitless there.

Nikesh Murali:

Having just paid my power bill yesterday, that's a very exciting notion.

Scott Nargar:

It's an exciting time where we talk people not having off street parking, it can be. We've had examples of leagues of customers that have fought very hard and worked with councils to be able to have extension lead over pass with the right safety precautions put in place and different things, which has surprised me, but good on them for doing that. Another one is that, it's not just the oil companies have shown their hand and whether they want to be with EV charging and hydrogen field charging in the future. And obviously NRMA has been a great leader in this space with the roll out of all those 50 kilowatt Tritium stations across regional New South Wales in the next phase of that, looking to go national during that announcement with the labor leader during the campaign launch.

Scott Nargar:

And, what New South Wales is doing, it's Coles, it's the Woolworths, it's the Aldis, it's the local government council chambers of the library that become a refueling station. They might not sell Coca-Cola and ice blocks and hot dogs and different things, but anyone can become a petrol station in the future or a transport charging station in the future. And that's what's really exciting. Why can't the local library or the local Macca's or whatever it might be sell the energy to propel your vehicle in the future. That's not just the home or an oil company, we've got a great opportunity in the future when everyone can see that it's a dollar that can be made here.

Scott Nargar:

We're seeing it now with shopping centers. It's kind of a funny one. Shopping centers is offering free electric vehicle charging. It's not an AC charge. It's very slow. You're not getting a whole lot of energy, but they've got shopping centers are covered in solar. We've got excess energy anyway, getting nothing for it in the grid. And they'll offer you free charging and potentially discounted parking or free parking. But the average person spends three times longer in the shopping center getting a couple dollars of free charge than an average customer, which means they're spending three times more opportunities to spend money on their credit card with the shopkeepers who are going to make more money. And then, the shopping centers can put their rent up of the shops themselves.

Scott Nargar:

So people looking at different ways to encourage different forms of charging and in those shopping centers, it's, you have a free charge and please spend more time in our shopping centers spending more of your money.

David Malicki:

Yeah, absolutely. And I'd have to back onto that to say that in New South Wales, we've got a destination charging initiative, which we've just started. And the intent is to support regional locations to install those AC charges that Scott was talking about, right? So we expect between 3,000 and 5,000 charges to be installed through that program all across regional New South Wales. And that's backing onto the amazing initial network that the NRMA built out there to enable connectivity across the regions.

David Malicki:

And so through that over the years that those will be installed, we're expecting EV charging to be ubiquitous right across regional New South Wales. It'll be easy to find an EV charger everywhere you go, as you're traveling around our great state. Other states have taken this on board as well. Like Victoria have a very similar scheme. Queensland have an electric vehicle super highway, they call it, right across all of regional Queensland as well.

David Malicki:

And like Scott said, there's the opportunity for sites to potentially make some revenue out of those charges. People are staying longer and visiting the sites and spending more money in these towns and locations. And they're excellent vehicle in these towns and locations, and they're excellent vehicle in an hour, that these chargers can top up between 40 and about 140 kilometers of range in an hour, which gets them to the next town to do more charging. So it's really excellent.

Scott Nargar:

Give me any excuse to spend a bit more time in a regional, or a country bakery, or a coffee shop to have another vanilla slice, or another pie, or another coffee. One of the big things that we are seeing, I'd love to see a bit more of here in Australia is when we're building DC charging locations, where we're doing a great job now in it and we had to start somewhere, we're putting one or two stations in. But what I'm seeing in Europe pre COVID, and the US, is those sides are having 10, 15, 20 chargers in one location and we'll get there when the volume of vehicles picks up. But I see frustration now, unfortunately at sites that people lined up behind one charger, or there's a competitor charger next to us that no one can use apart from that one brand, but they'll line up behind a free and our main charger and there'll be five people deep.

Scott Nargar:

And we've seen that frustration places like [inaudible 00:49:08], for example. So I'd love to see the Tesla charge, the network in Australia opened up so I could use it. I'll pay for convenience, I don't care what brand it is, I don't care whose network it is, I will pay for convenience to charge up and get moving along so I'm not stuck in the same cafe, eating more and more pies.

David Malicki:

And this has never been a problem as well, this kind of queuing for charging until very recently but it's definitely starting to appear as an issue. Elon Musk has promised that his supercharging network will be made open and available to all brands. It started to happen in Europe and other places so let's see when it happens in Australia. But it's a really good point around the number of chargers and fast chargers available in locations. And in New South Wales, we've taken the approach to ensure a minimum of four ultra fast charging heads at each of our charging stations that we construct. And that provides a lot of redundancy.

David Malicki:

So four charges that will be available per station at a minimum and likely to be more at each station over time as well. And we have a pretty good ratio of chargers, public chargers, two electric vehicles in Australia at the moment. So we're doing better stats, I saw a couple of years ago. That ratio is better than America, it's better than New Zealand as an example. But as more EVs come on the road and as the sheer demand for public charging increases, then the public charging network needs to be built up to keep up with that.

Nikesh Murali:

Yeah, I think there's something like 700 plus being deployed at this stage. And obviously with the announcement the NRMA have with the federal government that will be adding 117 to the national network. So the numbers are only going to keep going up and like both panelists have said, it'd be great to see people not having to suffer through lineups, and they should be able to get into the network and charge and head onto their road trip, or head back home very easily. And we should strive really hard to make that happen in the next few years.

Scott Nargar:

We are seeing something interesting when I'm driving around and get to spend a lot time with electric vehicles and dealing with parliament, sitting, heading down to parliament, to engage with our federal leaders. And I stop at Goulburn quite often, and I've been taking I5 down the last couple of trips and there's two charges at North Goulburn there. One's a 50 kilowatt Tritium and one's a 350 kilowatt. Whether it's an education thing, but we always find people that have cars that are max, they can't charge at 350 kilowatts, they can generally charge at 50 kilowatts or a hundred max, will jump on the biggest shiniest one available. And I turn up with a car that can take full advantage of that energy input into the vehicle, and I'm stuck on a much slower charger.

Scott Nargar:

So there's also that, I suppose, that courtesy thing too, that knowing what the intake capacity vehicle is and jumping on the charger that probably suits yours rather than one, with the biggest shiniest screen on it. That's one of those things. And I mean, I don't mind it's usually when I charge there I'm talking to people and talking about the technology, whether it's ours or our competitors technology and having a good yarn anyway, but when you are in a hurry, in a rush and you're trying to get to that meeting with that minister you've been dying for, stuck on a slower charger can hold a bit when especially charge...

Nikesh Murali:

I think it should be made mandatory that all of Scott's favorite pie shops have 350 kilowatt chargers that are blocked for him whenever...

Scott Nargar:

I had to stop buying those things.

Barbara Albert:

I feel like we need to clarify that for our listeners, we've thrown a lot of technical terms around AC, DC charging, 50 kilowatt chargers. Can you guys shed some light on what this all means for our listeners?

David Malicki:

To start this answer, the charging speed of a vehicle, an electric vehicle, depends on the vehicle itself, as well as the charger it's plugged into. So both of those have to work in tandem to allow the speed of the charge. On the AC front, AC chargers are typically between seven kilowatts and 22 kilowatts of capacity, and they're a slower charger but they're a dedicated charger and they can charge vehicles, but it depends on the vehicle itself because that vehicle, within the vehicle, needs to convert to DC within it to create the charge. DC chargers on the other hand are from 50 kilowatts, that's the starting point of fast chargers, up to 350 kilowatts and a 350 kilowatt charger is what we call an ultra fast charger.

David Malicki:

All of that DC charging goes directly into the battery it doesn't need conversion so it's quite quicker. But as Scott was mentioning, it depends on the capability of the vehicle. Some vehicles, some electric vehicles can charge at 50 kilowatts max, some at 80 kilowatts max, some over 200 kilowatts max. And so plugging an electric vehicle, it can only charge at 50 kilowatts into a 350 kilowatt charger you'll still only be getting 50 kilowatts of charge maximum out of that charging session.

Barbara Albert:

Awesome explanation. Thanks, Dave. And what about that? I do want to go back to one of the biggest barriers in terms of perception with consumers being range, so traveling long distances, we talked a lot about charging, but how good are batteries these days? Does it wear out quickly? How long can you drive with an electric vehicle?

Scott Nargar:

Yeah, I mean, that's a really good question. And we've got a range of batteries in our cars, we've got Li-ion you can start off and a lot of those through private fleets and also government fleets, they had 311 kilometers range. The big battery could do 484 kilometers. And it all comes down to the person behind the pedal, same with the petrol and get people who drive really, really efficiently and people that say my car gets terrible efficiency, but they're always hard on and accelerated hard on the break. The technology in EVs is awesome. And I think one of the best thing I like doing on drive days, whether it's number of branded cars there or different brand cars, is I love driving myself. Someone who spent 10 years in a [inaudible 00:54:48] and judging for best car awards, I just love tech. Is using people's different technologies, using generative break and to try and capture more energy, put it back into the battery, using eco modes and power modes and different ways of driving the vehicle to maximize either the power I want or maximize the range I want.

Scott Nargar:

And the vehicles have all got heaps of tech to show that if you turn the air condition on, you're going to drop 20Ks, or you're going to do this, or you put in power mode you're going to have this much range left. Batteries themselves are pretty good these days. Most manufacturers got good batteries between 300Ks and 500 kilometers right now, some do a little bit more, some do a little bit less, but anything from three to 500 is pretty suitable. I drive from the blue mountains into Crow park each day, and to better 60 K round trip and been doing EVs for years. I'll happily drive to Canberra and halfway back again, before I need to think about charging. Although most times I find a hotel where I can trickle charge overnight. So I do pretty extreme kilometers compared to most people. And don't really even think twice about charging.

Scott Nargar:

Cause I've come used to it. It's like charging a mobile phone. I don't panic about my mobile phone for no generally how I use it during the day. And if I need to charge it at night and cars are the same thing, once people come used to them, they'll be right. And I think one of the best things we can do as manufacturers is probably, I like the idea of those 24 hour test drives are going to a drive day and not being with the salesman, go and live it, drive it yourself and experience it. And currently most people that experience an EV doesn't matter, our brand or someone else's brand are solved. And if you can deal with the range as depending on what battery size you build, the range, the power and talk. And if you can understand the slow, fast charging times, both the AC time or the DC in the network, if you can live with that, and most people can.

Scott Nargar:

And any of these is a really great choice. We like to see them more affordable, have more choice of more affordable EVs here, but that's the hardest thing for ourselves is not trying to show people how many cup holders and how many speakers a car got all these great functions and features and how sleek they look. They look, it's getting people to understand what is your daily drive? Really what most people don't do that once a year or once every five year under Queensland, especially the way air fares are. It's pretty easy to fly in and rent an EV when you get to that location, if you can live with the range of the legals out there from 300k's to 500, do it, but we still see a lot of government and business fleet managers come to us and say, we need a car, 500 kilometers.

Scott Nargar:

That's good. What's the average range of your cars each day? And might say, I do our cars generally do between 20 and 60 kilometers a day, or at the extreme someone might do a hundred kilometers in a day. Then you don't need a car with 500 kilometers range, get an affordable car with 300 kilometers range. And every third K you get, that fourth one is free. So it's actually understanding what your fleet usage is of your daily drivers and buy the battery that suits that, don't over... Don't buy a battery that's too big, especially a number of our cars have different size batteries, so you can choose standard range or a long range, and so do other manufacturers. Don't over... it's definitely become easier when there's a lot more infrastructure in place, as well. So you're going to drive to port Macquarie or drive to Melbourne or drive to Queensland once a year or once every couple years, the infrastructures going in place right now quite quickly to enable that in any car with three hundred kilometer range, you can do that quite easily and quite effectively.

Nikesh Murali:

Yeah. Barbara, you can tell from the numbers that Scott's given you, EVs are definitely not ruining anyone's weekend. In fact, there is a Facebook group called "I ruined the weekend" where you can see these intimate stories about people doing 1000K trips to buy towing their trailers. And while we can't do the entire highway one, which is like 14,500 kilometers yet, but as Scott said that the infrastructure's going in, and it'll be possible at some stage. And you can do these long trips using the anatomy charging network or the ones from the other providers, you can do the great ocean road. You can do the cradle mountain drive. You can do Adelaide to port Augusta, Sydney to Coffs Harbor. Brisbane to Kers with the H network that David was talking about before. So there's definitely the range to do the sort of trips that the average Australian family does now.

David Malicki:

Absolutely. You can go from Cairns to Sydney, to Melbourne, to Adelaide, all in electric vehicle, a modern electric vehicle easily. And if you think about the average Australian commute, which is around 38 kilometers or so, and the average EV battery range, which is around 400 kilometers, then they don't need to be charged on average only every 10 days. And so it's a bit of an education piece for people to start to shift to the mindset. And that's a one charge every 10 days, or it can be trickle charged absolutely every night, and be full every single morning. There's examples of electric vehicles that have traveled half a million kilometers. They've done a million kilometers, one just ticked over in the last couple of weeks to a million miles. Now there are a couple of battery replacements there under warranty, but one of the great stacks is one of those legs, The driver did 400,000 kilometers on the one battery, no problems. And the range started at something like 340 kilometers. It was a second hand battery. And by the end of those 400,000 kilometers, it still had 310 kilometers of range on it.

David Malicki:

So the degradation is not very significant and most car makers are warranting their EV batteries for seven or eight years, and noting that to be a 70% capacity at the end of those seven or eight years. So the technology's really mature. It's getting better kind of by the day, and the car is probably going to fall apart around the battery in all honesty.

Scott Nargar:

For those ultra long drives as well from a road safety perspective, people should be taking a break every two hours anyway, whether they use the facilities or go grab something to eat or drink, but you should be getting on the car, stretch your legs and keeping yourself awake, and alert. So when you start the next leg of the journey and what a great time to charge up the vehicle for 10 or 15 minutes and have a bit of a walk around to keep yourself to drive.

NSW initiative to support the transition to electric fuels and electric vehicles

Barbara Albert:

So it seems to me that range anxiety, shouldn't be such a big problem once people actually start driving electric vehicles and get used to the new technology and then see that it's not such a big deal at all. But I wanted to touch on something that we mentioned a lot of times in our conversation, which is to support that the new south Wales government is providing. So David, what exactly is the new south Wales government doing? You have a package of nearly 600 million to support the transition into electric and fuels and electric vehicles in coming years. Can you tell us a little bit more about what it is that you're doing?

David Malicki:

Sure, thank you. And thanks to the others for, of bringing it up a few times throughout the podcast so far. So yes. Look, the new south Wales electric vehicle strategy is focused in on those key barriers, as I mentioned, and has a range of initiatives to try and overcome some of those and accelerate electric vehicle uptake. So firstly, on cost, New south Wales has \$3,000 rebates for electric vehicles under a \$68,750 threshold, but also we've eliminated stamp duty for electric vehicles under \$78,000. So combined that's reducing the upfront cost between around two and a half to five and half thousand dollars, two to five and

a half thousand dollars on average. So that's a good upfront price reduction there. And we also have a very strong focus on fleets. So there's a 105 million fleets incentive. That's there to support both council and private fleets that are operating 10 or more vehicles. To shift, to procure a new battery electric vehicles or fuel cell electric vehicles and smart charges.

David Malicki:

And so any business of that size that's eligible can bid into that process. It's a competitive bidding process and rounds run every six months with the next one, starting just soon in July, 2022. So alongside that, we're also electrifying our entire passenger fleet in new south Wales. It's 12,000 vehicles, or also, roughly that's probably the largest fleet in the Southern hemisphere and between all of that electrification effort, all of the support for new vehicles, tens of thousands of new vehicles, electric vehicles, we're going to be creating a flourishing secondhand market for EVs, which is really kind of absent at the moment. So that's on the vehicle in the cost front, on the charging front. I've already spoken about that destination charging program. The fast charging initiative we've got is to support private industry, to build own and operate ultra fast charging stations right across the state. So it's about we estimate around 250 of these stations will be constructed over the next few years, and be building out across our highways.

David Malicki:

So about 2000 kilometers of highways and ensuring that they're built at a hundred kilometer intervals. So that range, we talked about 300 to 500 kilometers of range. You can skip charging stations along your travel and still find one, a hundred kilometers down the path. Plus a big focus on commuter corridors in Metro areas and areas with limited off street parking. So that funding's already starting to be go out the door through the round through our first round, which is concluded.

David Malicki:

And importantly to say we've that all of those charges will be fully charged or powered by renewable energy. That's really critical thing for New south Wales government. As all of this work is done through an emissions reduction lens. So lots of initiatives on the table, we've AI already allowed electric vehicles to travel in T2 and T3 transit lanes in New South Wales. So a bit of a sweet enough for those that already own them for a short period of time. And then we're also looking at shifting over our entire 8,000 strong bus fleet to be low emissions vehicles as well. So a lot going on in new south Wales and a lot that other states are doing as well and replicating efforts in new south Wales. So there's upfront price reductions and incentives in Queensland, west Australia, Victoria, and most states are building up charging infrastructure networks, as well.

What does the Commonwealth government need to do

Barbara Albert:

That's so good to hear I can't wait for the buses to be electrified, because I hate that diesel buses, they're super noisy and polluting. So I'm really looking forward to that. Now on a Commonwealth level, Australia continues to be one of the only OECD nations, along with Russia that has not adopted fuel efficiency standards. As we've heard before, any other form of regulation to encourage an increase in the supply of low and zero emissions vehicles, other nations are leading the transition and we are becoming as the electric vehicle council is calling it a dumping ground for high emissions vehicles. What does the Commonwealth government need to do to be part of the solution, and what are the major levers it has

available to affect change? So is the 500 million future fuels and vehicle strategy enough or should the Commonwealth government be doing more in your opinion?

Scott Nargar:

From an industry automotive perspective, we're looking forward to working with the government to introduce emission regulation here in Australia. And that's going to ensure that we can get our fair share of vehicles from other markets in the world. And as we said, we're opening up plants in our region in Indonesia, in Singapore and other places, just building EVs. So whether we take cars from those plants or those plants at the moment, just making for those countries themselves, what it means is those countries that have a plant now don't need to pull cars from Korea. We can pull more volume from those markets. So that's the plan, anyway.

Scott Nargar:

So having an emission regulation gives us a target that sets a line in the sand. It gives a clear signal to all car manufacturers. This is what you need to meet at what point in time, whether it's a transition to banning internal combustion or it's just in the emission regulation to get to the certain CO2 level between now and 2030 or '24 and 2050.

Scott Nargar:

We need something to aim, to work, to plan cars five and 10 years in advance life cycle of the vehicles over five years. So you need to have something to work to wasn't plan towards. We need that KPI, that target to start to plan our businesses. Now we're in a great position from become a motor grip perspective from our both EV and hydrogen fuel cell.

Scott Nargar:

But there's a lot of factors out there that need a lot of time to start planning considering what those changes need to be, because what we don't want to see, and it's probably sounds funny coming from our brand, but we don't want to see a lot of manufacturers dropping on this market really quickly, which really denies consumer choice. We don't make cards to suit everyone's needs in the market. We don't make a Ute. So we do need good competitors here with a wide range of people, body styles, and different segments to meet our unique requirement here in Australia. So having something we can all work towards is going to make it easy. We're not guessing at the moment, we're guessing and while we're guessing our parent companies, whether it be in Korea or Japan or Germany or anyone in the world, us going to send cars to the markets where there's regulation and targets in place, because you want to avoid financial liabilities and anything manufacturer wants to do really well and sell big volumes of their product against their competitors.

David Malicki:

I'd add that internationally, we know that fuel efficiency standards are impactful. So that's the key thing to say. We don't have them here, but we know they're very impactful internationally, but the Commonwealth government has other levers at their disposal. So I believe that the incoming labor government has committed to eliminating import duties for electric vehicles. So they're not all electric vehicles, but that's of an upfront cost thing that they've committed to. But there's also the fringe benefit benefits tax, which is a Commonwealth tax as well. So they have a range of levers that they could employ to make electric vehicle

electric vehicles, the greater consumer choice. And as we've seen from that Norway example, they're the kind of levers that they pulled to make the change happen. The future fuels fund is fantastic. It's doubled to 500 million in over the last month and it's got a strong focus on that charging infrastructure rollout and on focusing in on support and research and incentives for fleets to move, to look at smart charging grid integration. So really important parts of the puzzle, but all incentive based.

Nikesh Murali:

And as David said, those incentives are very important. The fringe FBT exemption, for example, on a \$50,000 car, that's about \$9,000 in savings for the employers. With the import tariff on a \$50,000 car, that's about \$2,000 worth of savings. So all those kind of things add up along with the deployment of more infrastructure, to enable uptake, and the future fuels funds the latter focus. The second round focus is on the integration of hydrogen analytic vehicles into commercial fleets. That's such a key part of this journey, so lots of excellent initiatives in play that'll lead to increased uptake. But as Scott said, I think having that line in the sand with a mandatory CO2 standard, I think will definitely be useful on many fronts.

Scott Nargar:

A big one is creating a secondhand market. And I think whether it be state territory or federal government fleets, I think everyone's army uncle, or parents, owned an ex government Commode, or a Falcon, or Camry at one stage. It was just a thing to do back in the day, but getting those cars into those fleets, those big fleets owned by the government. They need to swap over every three or four years, anyway.

Scott Nargar:

We've seen a great trial done by one of the big fleet companies that we work with. And we work with all the fleet companies, but SG fleet after the federal government and the territory fleet, and also pass through New South Wales, I believe. And that number of other states, they've done some really good work on the total cost of ownership. And it made sense to run an electric vehicle where it's ours, on this instance, for four years, compared to a Camry hybrid for three years. So because the batteries have the big warranty, I've got eight year warranty batteries, you're still going to sell the vehicle on third or fourth or fifth year with factory warranty on the battery. So I think that transition those big corporate and especially government fleets. If we look at a fleet that I target first, and Australian post, they've got a huge passenger white box fleet moving all our parcels around. They've got trucks that are running up and down every single high day of the week, whether they're prime movers, multi combination trailers or rigid trucks. And it's a federal government fleet.

Scott Nargar:

Looking at those early and clear examples, those Australia post trucks run the same routes every single week between the states and the regional areas. Asian network refilling station, then your other guys, your tolls, the other big freight operators, and can start using the same things as well. So it's a matter of, New South Wales, Queens, and Victorian government, so we are working towards that, but it's how do we get that alignment with that federal government leadership with the station? And the great work being done by station territories now, and they're the new... Our governments new and fresh, and I think they've got a lot of great ideas, as well as the previous government and the work that've done through arena and pre infrastructure. But I think we're going to see a bit of an acceleration here.

Scott Nargar:

Structure, but I think we're going to see a bit of an acceleration here, and I think we're going to see more consistency across what needs to be done across states and territories with that strong federal leadership with cars. I'm probably one of the greatest people we find in a car manufacturer, but we can't move too fast either. If we bring in the band of internal combustion to meet Europe, or even some parties are talking about trying to do it even faster. If we had a government that was in minority, needed support of other independents and greens, the risk there was that we going to reduce consumer choice and rush things a bit too fast. I think we've got the best balance now of having the industry working with government industry and the charging networks, the energy operators, and everyone to sit down and understand what is a nice, planned out time to do this.

Scott Nargar:

There's no use bringing in too many cars, we haven't enough place to charge them. That's happening right now with some frustration out in the public charging networks. There's no use building these dull plated stations that you've got no cars to use them on. It's about industry and government and the finances and the energy people working together to do this in a planned and stage practice. Again, been 10 years behind US and Europe, means we've got some great examples to work off and the technology has matured far more than when they put in their network. So taking advantage of the best technology, the best low shedding energy balancing technology, to ensure that we compliment our grid and don't impact it.

Nikesh Murali:

I'm glad Scott brought that point up. I think the feasibility of the industry to meet those standards is very important. We can't have reduction vehicle choice and adding more [inaudible 01:13:42] on consumers and motorists, causing us to setback in the journey. I think that's totally support what Scott's saying there.

Corporate fleets**Barbara Albert:**

So we talked so much about government support et cetera, but I do want to turn our attention to corporate fleets. I want to talk about how businesses can get going with the EV and fuel cell EV plans and helping accelerate the change away from petrol and diesel. So previously, Scott, you mentioned a couple of really important things that businesses would have to look at in terms of evaluating their current fleet and their needs. I want to drill into that a bit more, what businesses do now to get started?

Scott Nargar:

Yeah. I mean, if they've got a larger fleet of vehicles, they've probably got a fleet management team or a fleet team looking after them anyway. So understanding exactly what vehicles can be transferred over now. I'm always amused when I talk to especially local government or some states that have a massive range of Utes in their pool and I ask them, what they've been used for? Then most times they're not being used for Ute type of duties, they have been used to take some packages around town or just to transfer people around town. Once in a blue moon, once in the three year lease period, they might have to go off road onto gravel somewhere. So can an equivalent vehicle, you may need to have one of those vehicles in your fleet, but do you need a whole fleet team or fleet of Utes when [inaudible 01:15:08] or a Nissan Leaf or a Tesla model, something may do the equivalent job, but one, it's a lot smaller [inaudible 01:15:14].

Scott Nargar:

Two, it's probably the safety modern car, especially EV's, is right up there. So understanding how your vehicle's being used and doesn't need to be a Ute or something large or commercial? Doesn't need to be a full size passenger carrying vehicle? Can it be something smaller, like the size of an NG or a [inaudible 01:15:37] or a Nissan Leaf? Again, I don't care what brand you choose, just choose something greener and cleaner and start to get people to focus away from, I need a big car, because I want to be [inaudible 01:15:48]. It's just that whole mentality has to be bigger, safer. Having the chance and opportunity with working better [inaudible 01:15:55] for 10 years of the crash testing Anchor, for a number of years and studying fatalities with different organizations, big doesn't mean safer, very rarely means safer. So a lot of times the best technologies are in the latest cars and then in the most affordable cars in many cases.

Scott Nargar:

Those people understand the fleets and trying to educate them about what charging is. We expect that whole charging thing, it comes back to the education's far easier for fleet manager business say, Barbara, here's your fuel card, making expense claims once a month and see you later. That can be as simple as that with EVs, but you need to understand the tools to be able to do that. That's our biggest thing is just trying to help people understand. I think it's an automotive industry and government and [inaudible 01:16:42] as a consumer advocate, we probably could all be doing a lot better in that area of consumer awareness. We'll probably see things start to change there from the federal leadership as well.

David Malicki:

Scott's made some really talked about some really excellent elements to fleet transition. I talk about a fleet transition plan, so do a full fleet transition plan. Look at the model availability that's out there now and what's fit for purpose. So Scott, you spoke about that really well just then. Think about that phasing of the entire fleet over to low emissions vehicles or a plugin electric vehicle, if that's the suitable choice in the first instance or the full battery electric vehicle. So that transition planning and thinking about total cost of ownership. I think we've touched on that throughout the podcast. I think it's a critical thing to think about. From an education piece, it's central to shifting to electric vehicles, because in the past there wasn't much difference between a larger vehicle and a medium and a smaller vehicle in terms of total cost of ownership.

David Malicki:

It was just all about upfront cost. There's a lot of talk about price parity. Price parity is one thing, but it's not the thing about shifting to an electric vehicle, because across the life of ownership, because electric vehicles are five to 10 times cheaper to operate than a traditionally fueled car, the total cost of ownership is the important calculation to do and businesses and larger businesses and fleets should be able to do that and be doing it already.

David Malicki:

That makes the case to the shift to electric vehicles alongside the emissions reductions, that cost side of things. Also, thinking about in that transition plan, what are the charging needs? Is that at home? Is that at the depot? Is that in the building and then billing. So we've already talked slightly about billing, the software solutions available now to reimburse employees, they're available now. So I guess the key message is, think about total cost of ownership, do a transition plan and get started now. The cars are here, it's a mature technology and the shift can start happening now and a business will start to fall behind if they don't start doing it today.

Nikesh Murali:

I think that's very key, that last point David raised, because I think you have to be realistic about the time period it might take to transition the fleet, based on the size of the fleet. It could be up as long as 12 to 18 months or more. Obviously with facilities upgrades that might be needed from an electrical engineering perspective, finding out what the demand is in the building that you are in and then the switchboard upgrades that you might need, permissions that you might need from the building owners, if you are commercially renting the building.

Nikesh Murali:

I think then making that thorough business plan that factors in lifetime cost and the kind of vehicles you need and what proportion of your fleet you need to transition. I think just factoring in that time is very important and just be patient in doing your research, find out what regulatory incentives are available for you and make a solid business plan as you do it. I think that'll lead to a more effective fleet transition. At least that's what we are hearing from. We are doing 20 EV drive days in partnership with the New South Wales government. We have some fleet days there and we talked to fleet managers on there and just trying to understand some of the transitional replants that they have in play. That seems to be something on top of their mind.

Scott Nargar:

We are seeing something at the moment, which is really surprising me, is the efficient use of fleets or the inefficient use of fleets. Having a building, whether it be a government office or whether it be a private business, where they've got a fleet of 30 cars in the car park, because each department with that business had a certain amount of vehicles in that department. When you see cars coming through for servicing that may have done, and we see it quite often, I actually get phone calls from service managers saying we've got cars coming through. They've only done a couple 100 or a couple of 1,000 K's since it's last service a year ago.

Scott Nargar:

Why are those vehicles there in the first place? Can you have a fleet of vehicles that are spread across a number of departments, rather than having them a share of vehicles in one department and having it like you're booking a meeting room or booking a Zoom meeting. With the telematics in vehicles and the functionality in vehicles, the fleet manager or the building operator or the person who controls the meeting rooms or the car fleet, can see what cars are being used, what cars are currently being charged, what cars have been parked in the basement, not being charged and empty and you can allocate cars based the one with the most amount of range in it.

Scott Nargar:

Currently we see so many examples of it and it's not just in governance, in private business, well, I hear about it from businesses themselves. A number of fleet companies are working with government and businesses around Australia to look at that asset sharing in a building, not just having a fleet of cars for every department, but having a fleet of cars for that building that shed like a meeting room office booking set up and getting that vehicle out, used every day on the road, as much as we can and reducing cost, reducing complexity and reducing assets that we see going to auction after a certain period of life that have been really underused. It's disappointing in some cases.

Barbara Albert:

In your opinion, should businesses shift to electric and hydrogen vehicles right away, or is there a phase where they would switch to hybrids and low emissions vehicle first and then to electric vehicles? What's your opinion?

Scott Nargar:

I mean, we're lucky enough, we're the only manufacturer to have hybrid plug-in, hybrid electric and hydrogen fuel cell vehicles globally still. I think, especially here in Australia, we're the only ones that have it, but we see hybrid and plugin hybrid technology as a stepping stone of transition. Our ultimate aim, because of emission rates and global targets is to go zero emission. Start with one or two cars, start with one or two percent of your fleet, three percent of your fleet. Don't go and replace a 1,000 cars tomorrow with EV, because you trying to make some net zero remission target you've got to have for this year or next year. Start with a couple of cars, speak to the NMRA, speak to the state government and industry experts, whether it's car manufacturers or some of the consumer advocacy people or whether it's the jet charges or the other people, get some information with those first couple of cars and make sure your drivers know how to drive them, drive an EV properly, how to charge properly, how to do things.

Scott Nargar:

A lot of people offer those education programs for that. Or you can find a heap of resources on the web and I'm sure the government and NRMO's have plenty resources too, but having a couple of cars to start with, we've seen this with so many councils across Australia, they've done it really good with a couple of cars to start with. Now they've gone to the fleets of 20, 30, 40 or a 100 EV's, because they didn't rush it and shock people. They bled them into the technology, had drive days and had K parties around the car to talk about different things in the vehicle. Talk about the safety and the technology on the vehicle.

Scott Nargar:

It's really trying to, we spoke about it before, is to ensure people aren't thinking about the misconceptions, what an EV can and can't do. Like any vehicle, they have their limitations, but also have a lot of benefits as well. People have probably explained that and they become, in most cases, we find those people become our advocates, advocates for our brand and our competitive brands and advocates for the technology. Want to tell their friends and family about their work, how they're driving, which is an EV. For me, that's a massive win. There's not one EV in Australia that we've got [inaudible 01:23:48], isn't heavily branded with different messaging about net zero, future and efficiency. So for us are a great branding tool as well to help educate the community.

What does the future look like?

Barbara Albert:

Thank you. We're almost out of time, but I do want to ask you guys the question about how you see the future? Over what time scale do you expect the transition to zero emissions transport fuels to take? Will we be living in a zero emissions transport world by 2015 or will it take longer than that for change to happen? Will some modes transition quicker than others, such as passenger cars and public buses and trains and will future vehicles be powered with renewables?

Scott Nargar:

My crystal ball out. That all comes down to the government of the day and the federal government of the day. Our mission regulation is going to drive this. When talk about 2030, 2040, 2050, that of course is going to be driven by that line in the sand we spoke about. What are we [inaudible 01:24:50] targeting for both heavy and light vehicles? Then we've got the great opportunity of agriculture and Marine and rail and everything else that's going to transition as well. It's going to be interesting. The next 10 years are going to be, if you're a fan of the automotive sector and love technology, the next five to 10 years, it's going to be amazing around the world and some great opportunities for Australia, because we're net export of energy. We don't import any energy. We can hopefully move away from importing our liquid fuels and pairing with our own green sunshine.

David Malicki:

Yeah, I'd say the opportunity is gigantic. The shift to electric fuels is inevitable. Those two things combined, the duration depends, like Scott said, on support, how quickly the shift can happen within car manufacturers and so forth. I think it's going to happen faster than people predict. We've seen it with solar. We've seen it with LED lighting and what most people don't see in the background are the cost reduction curves happening, both in battery technology, the sheer investment being put in place by both government and the industry, globally. It's in the billions and billions and billions and tens of billions of dollars. It's kind inevitable and it's happening. The technology is mature already.

Nikesh Murali:

Yeah, I'll repeat my off Peter state sentiment on this is that I dream of a beautiful world, where by 2030, we will have addressed the supply crunch. We have the charging infrastructure that's necessary and we've cleared some basic misconceptions about what transportation powered by renewable energy can do for us as a society. If we can achieve that, there is no reason why we would not be living in that kind of idealized utopian world in 2050. We can make that happen.

Key takeaway

Barbara Albert:

Definitely. Having heard all about the global drivers, Australia's uptake, the barriers, the enablers, good transition plans for corporate fleets, et cetera, after all of that, what would be your key takeaway messages that you want to leave our listeners with?

Nikesh Murali:

I'll go first. I think it's very important to, if you are an EV enthusiast, if you know more on what's happening with the sustainable transport solutions for the future, it's very important that you have those barbecue chats and talk to your family and friends and help make them aware of the possibilities offered by those solutions. I'll give you a great example. I was talking to some elder relatives of the weekend, who said to me, electric vehicles will never take off in Australia, because it's a large country.

Nikesh Murali:

They're the kind of people who drive their car to their two grandkids who live two kilometers away, go shopping three kilometers away. Electric vehicles with the smaller battery's perfect for them. That's most

people, they have low driving demands. So you will find in the conversation with those people that this is not like charging your mobile phone or any of those other solutions. You can power a home with this at some stage when the technology arrives. So I think that conversation is very important. If you are capable of those conversations and there's plenty of resources that we and the New South Wales governments provides you as well in terms of education, please pass it on so that we can, our children [inaudible 01:28:06] revolution quicker.

David Malicki:

Yep. Definitely learn about them. Businesses should start to get into them and start to procure some as trials or starting the transition of their full fleets and test drive one, if you haven't already. By being in one and driving it around a little while, you'll understand that they're a normal vehicle. They're just a normal car. They're just not producing any emissions. So get yourself educated on it.

Nikesh Murali:

Can I just sneak in a promo to come and attend the 20 EV Drive Days that we are running in partnership with the New South Wales government across regional and rural New South Wales and even the Metro. So come and experience them. There's a lot of OEMs there, including Scott's company. So we very much look forward to you coming and experiencing an EV and obviously getting that knowledge firsthand from charging providers and all the members who are part of the EV ecosystem.

Barbara Albert:

What about you, Scott?

Scott Nargar:

Yeah. The biggest one for ourselves is get into a car, whether it's our brand or one of our competitors, get into an EV, experience it. Whether at a drive day or go and visit a dealer or speak to the salesman, or just follow someone on social media about EVs. A lot of people talking about them. There are some people still kicking the technology, but there's a lot of positive commentary. Make your own mind up, but just get a chance to drive a vehicle by yourself and experience it. I'm sure you'll be sold.

Getting in touch

Barbara Albert:

Perfect. For people who want to find out more, what's the best way of connecting with you?

Scott Nargar:

From car manufacturers, go on to a website to check out the, or manufacturers who got great websites, talking about the technology, talking about charging times, cost calculators for what's the difference for powering your vehicle today with petrol against a daily range you do, against what it would look like, what you pay for home energy and the [inaudible 01:29:48] you do? So some great tools online for most manufacturers that we can find that. Certainly have a look at our website, [inaudible 01:29:55] and check out the [inaudible 01:29:56] there to work out whether an EV is right for you today.

David Malicki:

Yeah, certainly the case for us as well. It's all online. Just look up New South Wales Electric Vehicle Strategy and all of the various initiatives and support materials and so forth are there how to get rebates and so forth and information about electric vehicles as well. NMRA have an excellent EV hub online as well. Nikesh probably has more to say.

Nikesh Murali:

Yeah, as David said, the NMRA's EV hub is the go-to portal for you online, if you want to learn more about not just broadly about the EV technology, but also what the New South Wales government is doing and how that might benefit you in terms of purchasing and owning and charging an EV. We are expanding on some of those features, including creating an EV community online and obviously doing more experiential sessions like the EV drive days that we are having, that'll enable you to actually experience them firsthand. We even run education sessions on those days, but you get to hear from actually the owners, charging providers. So just a lot of initiatives that'll be rolling out and the website and all our social channels will be the portal to be on, but reach out to me on LinkedIn at any time as well. Totally happy to support you with information or with anything else I can do for you.

Barbara Albert:

I'm afraid that's all we have time for today. I want to thank you so much for giving up your time to have this discussion today.

Scott Nargar:

Thank you very much. Have a good day. Thank you.

Nikesh Murali:

Thank you, Barbara.

Outro

Barbara Albert:

That was Scott, David, and Nikesh talking about how we can reduce our transport emissions. If you know another person who you think would enjoy this podcast, please let them know so that more people can hear about best practice stories of how organizations are moving to net zero emissions. Remember to reach net zero missions, aim high, always be curious and act now. Thanks for tuning in and I'll see you in the next episode.

Patrick Denvir:

As always, you can find more information in the show notes of this podcast. If you are enjoying this show, please put in a review on your favourite platform, and we are looking forward to having you on our next show.