T R A N S C R I P T

LEGISLATIVE COUNCIL ECONOMY AND INFRASTRUCTURE COMMITTEE

Inquiry into Electricity Supply for Electric Vehicles

Melbourne – Thursday 12 February 2026

MEMBERS

Georgie Purcell – Chair
Richard Welch – Deputy Chair
John Berger
Gaelle Broad
Katherine Copsey
Moira Deeming
Tom McIntosh
Evan Mulholland
Sonja Terpstra

WITNESS

Ross De Rango, Founder and Director, Vehicle Charging Solutions Australia.

The CHAIR: I declare open the Legislative Council Economy and Infrastructure Committee's public hearing for the Inquiry into Electricity Supply for Electric Vehicles. Please ensure that mobile phones have been switched to silent and that background noise is minimised.

I would like to begin this hearing by respectfully acknowledging the Aboriginal peoples, the traditional custodians of the land we are gathered on today, and pay my respects to their ancestors, elders and families. I particularly welcome any elders or community members who are here today to impart their knowledge of this issue to the committee or who are watching the live broadcast of these proceedings. I also welcome any other members of the public watching via the live broadcast.

To kick off, we will just have committee members introduce themselves to you, starting with Ms Copsey down this end.

Katherine COPSEY: Katherine Copsey, Member for Southern Metropolitan.

Richard WELCH: Richard Welch, Member for North-Eastern Metro.

The CHAIR: Georgie Purcell, Member for Northern Victoria.

John BERGER: John Berger, Member for Southern Metro.

Gaelle BROAD: Hi, I am Gaelle Broad, Member for Northern Victoria.

Tom McINTOSH: Tom McIntosh, Member for Eastern Victoria.

Ross De RANGO: Pleased to meet you all.

The CHAIR: Thank you for appearing before us today. All evidence taken is protected by parliamentary privilege as provided by the *Constitution Act* and further subject to the provisions of the Legislative Council standing orders. Therefore the information you provide during this hearing is protected by law. You are protected against any action for what you say during this hearing, but if you go elsewhere and repeat the same things, those comments may not be protected by this privilege. Any deliberately false evidence or misleading of the committee may be considered a contempt of Parliament.

All evidence is being recorded, and you will be provided with a proof version of the transcript following this hearing. Then transcripts will ultimately be made public and posted on the committee's website.

For the Hansard record, could you please state your full name and the organisation you are appearing on behalf of.

Ross De RANGO: Ross De Rango, Founder and Director of Vehicle Charging Solutions Australia.

The CHAIR: Wonderful. Thank you. We now welcome your opening comments but ask they are kept to around 10 to 15 minutes to ensure plenty of time for discussion and questions.

Ross De RANGO: Thank you very much, Ms Chair. I will keep my opening comments to about 5 or 6 and have plenty of time for questions. First, I would like to thank the committee for calling me to give evidence. I have been in this industry for a long time. It is a pleasure to appear before this group with the goal of assisting in the transition to EVs.

You have a copy of my written submission. I will not be addressing that in my opening remarks but welcome questions on it at the conclusion of my remarks. I just have a few opening pieces before we kick off which really relate to your roles as parliamentarians, your constituents and the reasons that I believe that EVs would be relevant from your perspective.

Ms Chair, Ms Purcell, Animal Justice Party: if we do not shift to EVs, if we keep burning petrol and diesel, we are going to do serious harm to our biosphere. This is going to be okay for the crocodiles in north Queensland; they will be okay. But there are lots of other animals for whom it will not be okay, so there is reason to change.

Our Deputy Chair, Mr Welch: I understand from a little bit of Wikipedia searching that you were involved in inventing, patenting and manufacturing motion-tracking tech in cricket. It is fantastic to have innovation-led people in Parliament, because we are going to need a lot of innovation as we shift from petrol and diesel to electric.

Mr Berger: transport. Transport is the lifeblood of our economy. Blood is the blood in a human; if you stop the flow of it, the organism stops. If you stop the transport, the economy stops. My vision of this is that in the future transport runs on electric fuel – not diesel fuel, not petrol fuel – because that is better from a health perspective.

Ms Broad from the Nationals – longest comments for you, because I also grew up in the country, not far from where Georgie Purcell grew up. I am from Bannockburn, rather than Inverleigh.

The CHAIR: Oh, wow. No-one knows that area.

Ross De RANGO: Well, there you go. My mother grew up in Balranald, about 100 k's north of Swan Hill. I was up in Swan Hill a couple of months ago. The needs of our regional Victorians are not 100 per cent the same as the needs of our metropolitan. It is a unique environment. There is a different housing mix; there are longer travel journeys. There are requirements that they are going to have that are not as apparent in the cities. In the regional areas the economic conditions that make it stack up to deploy lots of high-power fast charging do not necessarily exist as readily, so there is going to be a need for some intervention and for some government support to ensure that there is adequate fast charging infrastructure out there. By the same token, though, people who live in regional environments do not tend to struggle with a lack of off-street car parking, where land is much cheaper; they have driveways, they have garages. They will be able to do almost all of their charging at home, except when they go on long drives, because again, in the regional areas people sometimes go further. My sister-in-law has a child who does rep basketball. She lives in Ocean Grove. They will do a drive to Woodend for a kids basketball game, right? Me, living in Moonee Ponds – we do not drive that far, so the charging at home is more than adequate.

Mr McIntosh, our former sparky from the eastern side of the state: this is a transition that is going to involve the need for an awful lot of electrical trades. We need to uplift the perspective of electrical trades for our school students so that electrical trades are viewed as a preferred choice. ChatGPT might be able to create PowerPoints for shows like this, but it cannot install actual power points, right? The idea of ChatGPT is 'Give me the rules for this switchboard.' Okay. 'ChatGPT, go wire this switchboard' – not going to happen. We need electricians for that.

And Ms Copsey from the Greens: this is obvious, right? Decarbonisation and fairness for all – EVs are going to help us with that.

That concludes my opening remarks. I will throw to the group for questions.

The CHAIR: Thank you very much – probably the most engaging opening remarks I have had so far. It is disappointing the other members are not here to hear theirs.

Richard WELCH: You set the benchmark there.

The CHAIR: I just want it on the record as well that I do not need convincing; I do have a home charger in Kyneton. But on your submission to the inquiry, I just want to ask some questions around EV structure in regional Victoria and the fears connected to a fire risk in relation to that. What do you think can be done to combat this concern?

Ross De RANGO: You are talking about fire risk at public EV charging infrastructure – that is the concern?

The CHAIR: Yes.

Ross De RANGO: Evidence is the best cure for perception of risk, and the evidence on this is very, very clear. EVs catch fire significantly less often than petrol- and diesel-powered vehicles, and that is because they

are fundamentally less complicated. There is not as much in them that can go wrong. I will draw a huge distinction here between road-registered vehicles and things like e-scooters and e-bikes that come in under less formal importation arrangements. If you are Hyundai, for argument's sake, and you are bringing in thousands and thousands of cars per year under one of the tightest regulatory regimes for a product that you will find anywhere in the world and you determine globally that there is a problem, then you run a massive recall and you fix the problem. I mention Hyundai because they did exactly this a couple of years ago. There was an issue with their battery stacks. They took in about 800 vehicles in Australia, not off the back of a fire in Australia but off the back of a handful of incidents elsewhere in the world, and they changed all the batteries. The result: no fires in Australia from that issue. If I compare this to someone who is bringing in a containerload of the cheapest scooters they can find from Alibaba on the strength of a credit card and then selling them on Facebook Marketplace, we have a very, very different circumstance – a very, very different perception of what risk is and how life cycle risk needs to be managed. I would close that out again just by saying: let us look to the evidence. We do not have evidence globally that EV charging at high-power public fast charging stations is actually a serious fire risk.

The CHAIR: Where do you think this fear comes from from members of the community? Is it misinformation or opposition to electric vehicles? Is it as simple as that? Or have there been incidents in the past that started that narrative?

Ross De RANGO: On the data, I would have to check, on notice, the precise numbers, but there have been on the order of eight to 10 electric vehicle fires in Australia to date on a fleet of about 400,000 vehicles. Those fires have typically been the result of things like high-speed collisions, arson or structure fires where the vehicle was parked in a building that burnt down and the vehicle went up with it, so not the sorts of things that would not also take out a petrol or diesel car. In terms of where the fear comes from, I would observe that about $50 billion a year worth of petrol and diesel is sold in this country for road transport and about $50 billion a year worth of new cars are sold in this country, 90 per cent of which are not battery electric. There is an awful lot of money tied up in the status quo, and wherever there is an awful lot of money tied up in the status quo there will be advocacy that supports the continuation of the status quo. This is not a uniquely Australian thing; we have seen fear-driven campaigns around EVs elsewhere in the world too.

The CHAIR: Great. In your submission you outlined a few examples of pretty poor behaviour by Victorian DNSPs. What kinds of requirements should we consider to place them on notice?

Ross De RANGO: The detailed mechanisms of how you do it would need close consideration from those who are better placed to observe the legislative instruments that might be brought to bear. In terms of the outcomes that would be desirable, faster connection timeframes; better visibility of network information so a party that is planning to execute EV charging installations can easily work out where there are going to go before they start a long connection process; service and installation rules, which define how a party may connect to a network; and having oversight from someone other than the DNSP themselves would be important. Then in terms what bodies provide oversight today, the Australian Energy Regulator, for example, looks over tariffs, but by comparison, in installation rules there does not appear to be any party that ensures that those installation rules are written for the community's benefit rather than written for the networks' benefit, with the result that I pointed out in my submission – instances like a kindergarten running on diesel fuel generation for months because connection was simply not made because the DNSP had views about what should be done.

The CHAIR: Thanks for that. I will pass over to Ms Broad.

Gaelle BROAD: Thank you very much for your contribution and your entertaining start. I am just interested – you mentioned the importance of lowering emissions. I mentioned earlier in a couple of the sessions that there was a report on Channel Seven's *Spotlight* last year where they visited Indonesia and looked at a nickel manufacturing facility that supplies 70 per cent of the world's nickel, the critical component required for EV batteries. There seemed to be 11 times the emissions of Australian manufacturers of nickel. Would you support labelling or information for consumers to know where those batteries are coming from in electric vehicles?

Ross De RANGO: Information transparency as to the origin of materials and things is generally a good idea. I am a big believer in buying Australian-made where that is possible, because I would like to see my kids have work in the future. In terms of nickel specifically, far more of the world's nickel ends up in stainless steel than

ends up in batteries. Nickel is a global commodity used for all sorts of things. If we were giving consideration to what global harms are being done by the nickel industry based on where that nickel comes from, we would need to be looking much, much broader than at just batteries. I did see the piece you are referring to of course. I would observe there that we live in a global economy where commodities are extracted and traded in all sorts of ways. The cure to concerns on the part of a legislative group around this would be to look at trade relationships. If there are serious concerns around where the nickel comes from, then that could be looked at. I would caution that if that led to batteries that contain Indonesian nickel, for example, not being allowed to be imported, that that would be a pretty serious overreach in my view.

Gaelle BROAD: Okay. I am just interested too – you mentioned fires. I know this has been raised by CFA brigades in the regions, because there has been rapid rollout of solar farms and lithium ion batteries, including EVs. I understand there remain no Australian standards to fight such fires, and the training CFA receive is to use water and let it burn, which releases toxic chemicals and puts volunteers and communities at risk. I have heard that in Europe they use containers or something to contain vehicle fires. But at the minute, as was said before, there are 1 to 2 per cent electric vehicles on roads. If that ends up being 50 per cent and we have got over a million extra chargers needed, what do you see as the risk with fires, and how do other countries treat them?

Ross De RANGO: Sure. On fire risk more generally, we have one of the world's leading experts on this stuff right here in Victoria – that is Emma Sutcliffe of EV FireSafe. If you are interested in EV fires at a detailed level, I would very much recommend you get Emma before this committee and have a chat to her. She is a serving firefighter as well as being one of the leading global researchers in this stuff.

On the question of safety for firefighters, it is not a good idea to breathe in the smoke outputs from any kind of vehicle fire. Whether it is a diesel vehicle fire or a petrol vehicle fire, once the vehicle is on fire – and from time to time vehicles will burn; this is a thing that happens – the firefighters will respond to that by using breathing apparatus if they are anywhere near it, and they should. We do not want untrained civilians approaching these things and getting a lungful of the chemicals that come off any car fire, regardless of what the powertrain is. The fact that EVs burn significantly less frequently than petrol and diesel cars is a factor of improved safety for the community. I appreciate the point around sometimes the guidance is 'Pull the thing off the road and let it burn'. Firefighters respond to building fires from time to time in a similar fashion. If it is determined by the people on the ground that the right strategy is to hose down the area around it and keep everybody safe while the fire runs its course, that is sometimes how it is done.

Gaelle BROAD: Is that the response now with electric vehicles? How do they handle –

Ross De RANGO: Again, I would say the right way to find out precisely what guidance is being given to the fire services right now would be to talk to the person who is absolutely expert in that area – I would defer to Emma. But yes, to your point around the variety of ways that this is done, there is no shortage of organisations manufacturing and seeking to market solutions for this problem. There is no issue at all in jumping on social media and finding half a dozen or a dozen companies, all with what they perceive to be the perfect solution. I would say that the people who are boots on the ground, doing the research and actually working out how best to do it, would be better to speak to than those looking to sell the equipment.

Gaelle BROAD: Thank you.

The CHAIR: Thanks, Ms Broad. We will go to Mr McIntosh.

Tom McINTOSH: Thank you. I have got to get my head back to where we were earlier: DNSPs. We hear in conversation and we hear reports that, with chargers being put in, DNSPs are taking too long, rightly or wrongly making excuses why they cannot be put in. Do you think there needs to be some sort of timeframe or simplification, probably similar to the conversation we have had around housing in the last year or two, so infrastructure can get put in more quickly at lower cost overheads so we can get more of a structure out and about?

Ross De RANGO: The short answer is: yes.

Tom McINTOSH: Yes.

Ross De RANGO: The slightly longer answer is: where you have a competitive market delivering services, if the party delivering the service is not particularly good at it, then the customer has the option to go to some other service provider. This is not the case with the DNSP. It is a monopoly. There is nowhere else to go. For that reason, the monopolies are regulated around matters of performance. For reliability, for example, there is a mechanism called STPIS, which mandates reliability. If the distributor falls short of its reliability target, it is financially punished for that failure. We do not treat petrol stations the same way, because they are a competitive marketplace. The penalty for BP or Shell or Ampol if they are unreliable is that drivers will stop using their brand and go elsewhere. One of the mechanisms you could consider bringing in would be penalties for distributors that are tardy when it comes to approving new connections, because right now they have got processes around connection processes but no stiff financial penalties for underperforming in that regard. That would be one of the ways that you could bring a correction to it.

Tom McINTOSH: Thank you. I want to go back a step. We heard earlier this morning that the average car will travel 30 kilometres a day, and yes, there will be people who will jump up and down and say some people drive more – absolutely, I recognise that – and they will try and ban stainless steel sinks and other things, but we will leave that to the side. If the average car – let us say half the population – is doing 30 kilometres or under, yes, it is important to have these kerbside conversations. But if we look at the map – I presume you have given us this map here – there is a lot of charging infrastructure in metropolitan Melbourne. If, let us say, half of cars or even three-quarters of cars are probably only going to need to charge once every seven to 10 days, are we looking – I think we need to walk and chew gum, but in a lot of conversations today it is almost this feeling like the car has to be on charge all the time. Are decision-makers a little bit in their own heads? Or maybe not decision-makers. Are political-class and social commentators a little bit in their own heads about how frequently vehicles need to be charged?

But, also put alongside that, I have concerns about tourist towns. You mentioned before travelling across regional Victoria, where there is not enough charging infrastructure and where people do get stuck with the ranges. And I said this at the end of my last question, but I will throw the third piece in: should there be more impetus on our existing service stations, Caltex, Mobil, BP and Ampol, to be getting infrastructure in so that people, when they are on the road out in regional Victoria, can find charging infrastructure subsequent to that that is already in our regional towns?

Ross De RANGO: Okay. I think a three-part question.

Tom McINTOSH: Yes. Thank you. Sorry.

Ross De RANGO: Let me see if I can tackle it. If I miss bits, let me know. Kerbside, how much infrastructure do we need in situations like mounted on a power pole so that a person who does not have access to off-street parking can charge their car? The nature of the business that I run at VCSA with my business partner Dave is that we are offering solutions for exactly that use case – for the person who parks in front of their house because they do not have a driveway, they do not have a garage. That describes 5 per cent of the driving population. Three-quarters of the Australian population live in something like a standalone house with off-street parking or a garage. Most of the remainder live in a flat or a unit with off-street parking where some electrical infrastructure needs deploying in their building in order to enable them to charge at home but they do not have to charge on the street because they park on private property. It is a matter of running a wire to it. A recommendation for the committee could well be to fund Energy Safe Victoria to create guidance material to make it very, very easy for electricians to do work in that domain – a document that says 'If you've got a two-storey walk-up, this is how you wire it to make it easy for the energy that goes to the car park allocated with the dwelling to be fed from the metre associated with the dwelling.' So just like in a standalone home, the energy used for the car turns up on my bill – so for that chunk of the population, which is maybe 20 per cent. For the 5 per cent of people who are in that circumstance of parking on the street in front of the house, a variety of solutions can exist, including going to their local fast charger in their local shopping centre. The papers are handed out. I have got examples of three that are within about 5 minutes drive of my house. At about 7 o'clock on the night before last most of those charging bays, ultra fast, were readily available. So that is one option. These people can charge at work; that is another option. In the fullness of time they will be able to buy the kind of boom-over-the-footpath solution we do; that is another option. And there are mounted EV chargers on power poles, another option again.

The risk in this discussion is that it is perceived that we need massively more of that 'mount an EV charger on the power pole' infrastructure than we actually do. We overdeploy it to the tune of thousands and thousands of pieces of kit, and then we all have to pay for it in our energy bills. We need to do some of it. We need to calibrate how much we do against the need.

Regional towns – I heard the beep; am I right to continue answering the question?

The CHAIR: Yes, of course. Go for it.

Ross De RANGO: Very good. So regional towns: if we look out in your patch, the distance from, say, Orbost to Cann River is about 75 kilometres. The typical EV has a range of hundreds of kilometres, and in both Cann River and Orbost there are fast chargers. So if you are a driver from Melbourne, or indeed if you are a driver from Orbost and you are driving back and forth on that route, there are fast chargers conveniently spaced. One of the challenges is that, unlike the huge 10-bay, 12-bay multibay charging arrangements that we see in Moonee Ponds shopping centre, the systems that are out at Cann River and Orbost might be one, two or three chargers, so there is an increased likelihood that when people get there during peak holiday seasons they will be queuing and there is an increased likelihood that if one or two pieces of equipment are out of action there will be a problem. So the deployment of more infrastructure in those locations is important. This is balanced out by the challenge of commerciality. The road usage volumes in those places do not look the same as the road usage volumes on the Hume in the middle of Ms Broad's patch, right? On the run from Melbourne to Sydney you do not need any government intervention there beyond 'Let's make sure that the regulations are right and the connection processes are okay', because it will stack up commercially. On the run east from Orbost, you might need some government intervention by way of support. On the run up to Swan Hill, you might need some government intervention by way of support in order to close that commerciality gap for the EV charging operators.

Your last piece was around petrol station operators. It is already the case that Shell, Ampol and BP are deploying hundreds of high-power chargers at their locations. These are commercial businesses. Globally they have read the play, and they are fully aware of what is happening. Shell, as an example in Australia, before they started deploying EV charging equipment, were buying energy retail businesses, that is, electricity retailing businesses, right? They acquired Powershop with 140,000 customers. They acquired ERM Power, a commercial and industrial electricity sales organisation with about 10 per cent of the contract papers for commercial and industrial electrical sale. These businesses are not asleep at the switch. They are global players. They have got billions and billions of dollars.

To the extent that they are slower than some people might feel is ideal at the deployment of infrastructure, it is a factor of two things. The first one is commerciality in the location. It would not be reasonable to expect that BP, Ampol or Shell would prioritise Swan Hill, for argument's sake, for high-power fast charging, because the utilisation of those assets will be relatively low compared to the inner-urban locations, where they have a market of millions of people, many of whom live in apartments that have not yet been rewired to support EV charging. And the other is DNSPs. BP's submission to the New South Wales parliamentary inquiry last year called out specifically that connection processes had led to them reallocating capital to other markets. A major multinational had sought approval and received it to spend millions of dollars deploying high-power DC charging equipment and then shifted that money to other markets to execute because of connection process problems.

The CHAIR: Great. Thanks, Mr McIntosh. We will go to Ms Copsey.

Katherine COPSEY: Thank you. I was keen to hear your thoughts on vehicle to grid and where we are up to with that technology. To your knowledge, how available is it to households and individuals at the moment, what are the barriers that remain in place to its uptake and what can government do to speed its uptake?

Ross De RANGO: Awesome. Yes, very, very excited about this one. Per my note at the start of my submission, I have been involved in a variety of Australian standards. I am part of the team that is doing the update to the Australian wiring rules. I had a fair bit to do with the last update to Australian standard 477, which governs grid-connected inverters. That is the critical piece for vehicle to grid from a standards viewpoint. About a year ago a new version of that standard, which a lot of talented people in industry had a fair bit to do with, got released. Since then it has taken about a year for the follow-on certification processes and manufacturer

paperwork to get to the point that we now have several vehicle-to-grid pieces of charging equipment certified and permissioned for sale. The reason that that took several years – again, I come back to DNSP requirements around performance under Australian standard 4777. That is a standard that was written for solar inverters; it was never written for vehicle-to-grid inverters, so the global vehicle-to-grid inverter manufacturers were not compliant with that standard. We had to spend the two to three years fixing the standard before they would comply. That piece of work has now been done, and we are seeing Amber, for example, with a trial program funded by ARENA, looking to place 50 vehicle-to-grid chargers in people's homes. They apparently have a waitlist of 4000 people who want to be part of that trial. They will not be alone. The other major electricity retailing companies, the big ones – AGL, Origin, Energy Australia – will all make a play in this regard, because they are all exposed to wholesale spot prices. They have an exceptionally strong motivation to secure those flexible, behind-the-meter loads, with customer permission – I stress, this is not a matter of the retailer stealing the juice without your permission – for the benefit of the customer and for the benefit of all.

In terms of what government could do to accelerate this, this is a brand new technology. We have seen how effective the cheaper home batteries program has been at accelerating battery rollout in people's homes. We have seen how effective over 20 years the subsidy mechanisms around solar have been at accelerating rooftop solar uptake. The country could do with a short-term rebate for vehicle-to-grid inverter installations, because that is what would make it very, very attractive in this brief period of time, while vehicle-to-grid inverters are expensive because the volumes are low, to make it stack up for the consumer – and I say 'brief period of time' because in the long run there will be no subsidy needed here. The size of the battery in the car and the variation in the wholesale spot price market rate are such that if you have a future where vehicle-to-grid inverters cost about the same as today's solar inverters, the payback period for the consumer might be a year or two. Under that circumstance lots of consumers will just jump in and start doing it. It is a short-term matter where if we want to accelerate it a little bit of support would accelerate it.

In terms of the benefits, we will not have a future where every EV is exporting to the grid, because we cannot. We have 20 million light vehicles in this country. If they are all exporting at 5 kilowatts, that is 100 gigawatts. Peak demand on the grid is 35, right? There is not sufficient demand to draw on all the vehicles exporting at once. We may reach a point in the fullness of time where one vehicle in five is doing vehicle to grid, and the vehicle that is doing it will likely look like that of someone like me, who drove to work, drove home and plugged in at 5 in the afternoon. The car happily starts exporting to feed my air conditioner and cook my dinner, with the balance going out to the grid, and at 9 or 10 o'clock at night the car stops exporting, as the grid does not need it anymore. At 11 o'clock at night I go to bed, and at midnight the car starts charging and is full the next day ready for work, with increased grid utilisation, more stability in the network and better reliability locally, especially during heatwaves when you do not want the transformers in the zone substation assets to be drawn on as heavily as they can be in those peak periods. I am very excited about it; it probably shows.

Katherine COPSEY: The other thing that I am really keen to get your expertise on – you mentioned state planning and heritage and their interaction with renewables infrastructure at the household level, which I had some experience with in Port Phillip, with people trying to get panels on heritage houses and being disappointed. What do you think the state government can do to balance heritage considerations with the rollout of infrastructure necessary for EV uptake?

Ross De RANGO: I would observe that heritage is not just a function of our built environment. Burning coal for electricity is also heritage. Riding horses to get to work is also heritage, right? The world moves on. We have a circumstance in some of our local government areas where up to 70 per cent of the housing stock is covered with a heritage overlay. In the area where we are doing our deployments of our VCS One solution in Merri-bek, 40 per cent or thereabouts of the homes around Brunswick and Coburg are covered in heritage overlay. The heritage consultants that are employed to give advice in this area consider essentially that anything that is new or different, anything that is not visibly 80 or 100 years old, has no place being in that environment. To your point, more broadly than EV, this means no solar panels, which would have an effect on reducing climate emissions at the household level, reducing electricity bills and creating improved resilience. It means no water tanks. If you want to put a plastic water tank beside your house during a period of water restrictions to water your garden, that is something you cannot do. It means you cannot paint your fence the colour you want to paint your fence, and it means that if you want to install EV charging, it is not allowed to be visible from the street. Now, in these heritage-listed areas, they have an over-representation of that kind of home that does not have off-street parking. If it does not have off-street parking and you want to install EV charging, there is no way to make that invisible.

In terms of what corrections the state government has at its disposal, state government, when faced with challenges around housing construction, when opposition from certain local governments to increased densification slows down the construction of housing, can take steps to determine what powers local governments have. This would be a similar area. If you want to look at how we ensure that more inner-city dwellers are able to install rooftop solar, the question would be: does state government need to start pulling back some of those powers around heritage that local government currently has?

The CHAIR: Thanks, Ms Copsey. We will go to Mr Berger.

John BERGER: Thank you, Chair. Thank you, Ross, for your attendance today. I am interested to hear what you might say. We have heard a fair bit about myths today, and I want to hear what the myths might be in relation to second-life batteries.

Ross De RANGO: Sure. The concept of second-life batteries, if we take it one step back, is where we have a brand new battery that has been installed in an electric car. It has gone into the market as a car, and it has seen 8 years, 10 years, 12 years, 16 years use as a car. These cars are going to last about as long as cars on our roads today. So typically they will be ready for scrapping at age 15 or 20 years. They might have gone through several users before then.

People worry about the longevity of the battery in the vehicle. What is being found globally is that the batteries are outlasting the cars. So we are getting to a point where the trim, the finish, the shock absorbers, the car itself is ready for scrap, while the battery retains significant utility. In that circumstance, what we do not want to do is render the battery down to its component molecules and recycle it into something new – that is energy intensive. What we would much, much rather do is reuse that battery as a useful battery until the battery is also fully clapped out and then recycle it. That is the second-lifing of batteries that I believe you are speaking of, Mr Berger.

There are a variety of ways that that second-life battery can be used. This is already a multibillion-dollar business in China and in the US. We could take our leads from those markets that have a larger stream of second-life batteries available. In Australia the second-life batteries that are available and which are being used are not coming so much from vehicles that have reached the end of their normal life, they are coming from vehicles whose lives have been terminated early by an encounter with a tree or a bridge or something made of concrete that did not give. Those batteries are being recovered in salvage yards, and they are being picked up by businesses that are doing things like building remote equipment for mining sites – backup power, right? – coupling solar panels, diesel generators and second-life batteries out of Teslas and BYDs to provide resilient power in remote locations. I think there is an awful lot of future in that. I suspect further, once more batteries are available, those second-life batteries could well be containerised and used for tasks like grid support. We can imagine a circumstance where, beside a zone substation, there is a steel box with 20 or 30 vehicle batteries in it; a fire suppression system in it, because assets like that need that kind of equipment; and at peak time in the grid, the grid is supplied from that asset, and it only needs to work a few times a year to really take the edge off the need for millions of dollars worth of upgrades.

To the questions around fire, a part of the reason to locate it in an industrial location like that and wrap it in steel is that if there is a fire, the consequences are reduced. It may be the case that second-life car batteries end up as domestic batteries in people's homes. That would be an area where some work on the part of Energy Safe Victoria and the fire safety folks would be needed, because there might be people who are concerned that a battery that has seen 10 years of use in a car bouncing around on the road gets installed under the stairs in their house, right? It would be rational for people to think about that, and the right people to give expert consideration to that would be your safety regulator and your fire services. That said, there are plenty of places other than people's homes for second-hand batteries to go.

John BERGER: There you go. The second question is in relation to topping up the battery in your car. I refuel my vehicle quite frequently because I do not want to be caught short anywhere just because of the kilometres that I do. How do you change the perception of people that do not need to top-up the electric battery every day like I do with a car?

Ross De RANGO: The cure to a lot of these misunderstandings is: 'Please go test-drive an electric car for a few days.' Experience is a huge part of the cure. You are correct. You do not need to top up every day.

John BERGER: What would be a recommendation that would be useful for the committee going forward and in the report that might alleviate people's fears in relation to that?

Ross De RANGO: A recommendation to the committee would be to create robust educational materials that are accessible to the sorts of people that are at the next wave of uptake of EVs. If I am thinking about which of the consumers currently driving petrol cars today, who would be the easiest to move to EV, the lowest hanging fruit in our community? We have in Australia about 20 million road-registered light commercial vehicles, so light vehicles and light commercials – cars, utes, vans, that kind of thing. About a quarter of those, roughly five million, are the second car in a two-car family, right? That second car in a two-car family does something less than 15,000 kilometres a year. It is not the one that generally goes out to Cann River or goes to Swan Hill; the other car does that. It is the one that does all the urban running around. That is a vehicle that if you plugged it into a standard 10-amp power point twice a week, that would be all you would need to do in order to keep that vehicle charged and ready to go for the missions that it undertakes. Communicating that kind of content in a manner that is accessible to people who are giving consideration to what their new car is, giving it to them not from someone like me, an industry advocate who of course is going to sell all the benefits of EV, but from a person that they trust, that is the kind of work that would be really beneficial. In terms of how the committee could bring that about, the Victorian government has communication specialists. It has energy specialists. The people who can do this work are employed as public servants; they could be put to this task.

John BERGER: Thank you. Thanks, Chair.

The CHAIR: Thanks, Mr Berger. We will finish with Mr Welch.

Richard WELCH: Thank you, Chair. Thank you, Ross, for coming in today. I will probably quietly demur from the idea that you do not need to charge up every day. If you have got far less availability of places to fuel up, both geographically and in terms of time availability – so if you have got a busy week ahead – you will top up very regularly because you have got less choices on the road about where and when you can do that, but that is a minor thing.

Ross De RANGO: Could I just, with respect, disagree with that? If we want to get into it, we can –

Richard WELCH: You can have your lived experience, and I will have mine, but the question I want to ask is – you make a good and a solid critique of DNSPs. The question would be: a lot of what is suggested by you and others is generally punitive towards the DNSP; what about the other approach? How do you get the interests to align? Is there a more positive way that economically you can get this to align so that they have actually got a vested interest, as opposed to penalty, to do so and put capital towards it?

Ross De RANGO: So you are looking for a mechanism to achieve the correct behaviour from DNSPs that is not entirely punitive?

Richard WELCH: Yes.

Ross De RANGO: Sure. Two-sided mechanisms are perhaps the go-to example there. I mentioned the reliability mechanism – STPIS – earlier. That has a punitive side; it also has a reward side. To the extent that the DNSP does reliability better than the threshold requires, they are financially rewarded for that. It is also the case that while these are regulated enterprises, they are for-profit businesses, so doing their job well leads to returns for their shareholders over and above their regulated rate of return.

Richard WELCH: But is the reward a government reward or is it actually just a business reward, a profitability reward, that does not rely on a regulation or a subsidy or a cost? Can you make it profitable for these organisations to do it – to want to do it – because that is the best motivation of all, right, to do it well?

Ross De RANGO: The nature of a DNSP is that they have a regulated asset base on which they collect a regulated profit. So they have a very strong motivation to grow that regulated asset base. That is a big part of what is behind their efforts to enter the competitive parts of the market. It is fundamentally why businesses like Ausgrid are looking to deploy thousands and thousands of EV chargers and rate-base that equipment. In terms of their future profitability, these are businesses that are involved in the delivery of electrical energy. We have a world today where we use $50 billion a year worth of petrol and diesel for road transport, and we are going to

be moving that to electricity. This is not a world in which those businesses are going to lose, provided they support it.

Richard WELCH: Then why aren't they investing in it? Why aren't they moving capital to it and service provision to it and making it happen? What is the obstacle?

Ross De RANGO: I would encourage you to put those questions to the DNSPs. I can speak to it as well.

Richard WELCH: To be fair, you have done the critique.

Ross De RANGO: I have.

Richard WELCH: Surely then you would know there must be another side to it. What is it?

Ross De RANGO: These are regulated monopolies, right? When they are questioned as to why they are not being innovative, they point to the fact that they are regulatorily constrained.

Richard WELCH: And they cannot make money from it.

Ross De RANGO: Well, that, but the counterpoint is if you look across the spread of all the DNSPs in the country, they are not all tackling this the same way. So if I consider our Victorian DNSPs, they are underperforming relative to other DNSPs in Australia that are under the same arrangements. I point to culture. So if I look at Essential Energy, for example, in New South Wales, the CEO of Essential Energy drives a Tesla. They are culturally biased towards, 'Can we support this transition to EVs?' And it shows in their conduct, in their regulatory approach, in their installation rules. In Victoria we have not seen that sort of support.

Richard WELCH: Yes, okay, but having said that, is there a way to make it in their financial – to make them correctly market motivated to do it? Is there is there no mechanism for that other than cultural?

Ross De RANGO: We use competition, generally speaking, to achieve that kind of outcome in the rest of the economy. Where an entity is a monopoly, we use regulation to bring about the outcomes that competition generally does.

Richard WELCH: Okay. So in that sense only regulation and punitive approaches are viable.

Ross De RANGO: I have no issue with two-sided approaches. If the mechanism –

Richard WELCH: Do you have any suggestions of the other side? That is what I am fishing for.

Ross De RANGO: I understand. I am strongly disinclined to give them much more when they are underdoing their core task. I think the expectation that the community should have of a foreign-owned for-profit monopoly that acts under tight regulation is that it acts in the interests of the community. We are not saying they cannot make a profit. They make a regulated profit. We are saying that in exchange for that licence of monopoly, they should perform.

Richard WELCH: Okay. Thank you, Chair. Thank you, Ross.

The CHAIR: Thanks, Mr Welch. Do any other members have further questions?

Tom McINTOSH: I have got one more that Mr Welch asked earlier to the last panel about how expensive it is to put in, let us call it, a 50- or 100-kilowatt fast charger. Broadly speaking, how much does that cost? And the rate of return – we heard before five to 10 years, but I was not super convinced because they did not know what the price of the equipment was. Installation may change, but have you got a broad sense of those rates of return for commercial installation?

Ross De RANGO: Sure. I would suggest that getting accurate data rather than the kind of hand-wavey that we can do in this sort of setting would be worth doing. If you are looking for accurate data, you could talk to Sam Kelly at Randwick council in New South Wales. They have a large fleet of council-owned EV charging equipment which they manage, and they have determined what the relevant rates of returns and profitability are on that equipment. What that will show you is there is a huge range. There is equipment that you can deploy which will make money back within a couple of years because the utilisation is very, very high for particular

kinds of equipment in particular places. As an example, the materials that I have shown you today, that site that is in Moonee Ponds shopping centre: there are six ultra fast charging bays from Tesla and six from Ampol in that location. Tesla, I would suggest, makes pretty good money out of selling electricity at a high price to the local residents around that area who do not have off-street parking. If I was to consider a fast charging site out in East Gippsland that sees use maybe once or twice a day rather than continuously, the profitability there will be a challenge, potentially at the level of the operating income not covering the interest on the loan that was used to buy the equipment. So you could well have a site that – forget this question of 'When is the payback period?' The payback period is never, and it is a commercial loser.

Tom McINTOSH: Hence we cannot just be government in or government out. There are different –

Ross De RANGO: That is right. In some locations it will need to be government in. If I take a perhaps more obvious example, Western Australia is a much, much bigger state than Victoria, with parts of the state where not very many people go, and when they go there they are not usually taking EVs. But if you want to unlock EV ownership in Perth, you need to make sure the infrastructure is there. The Western Australian government deployed a network of high-power fast chargers entirely around the coast. So from the point at which you cross the Nullarbor coming in from South Australia all the way down through Margaret River, up through Perth, up past Broome and around to the Northern Territory, there are fast chargers there every couple of hundred kilometres. Those sites are not commercial today, may not be commercial in the next 10 years and may not be commercial in the next 20 years, but they were deployed as a strategic measure via state government that looked at the number of people who were in Perth buying vehicles. They wanted those people to buy EVs with confidence that, should the mood take them to drive to Broome in that vehicle, that would be a thing they could do.

Now, Victoria is a much, much easier challenge. We do not have those kinds of distances. Melbourne to Mildura is 500 kilometres or something like that. Put in three or four locations along that route. Look at the locations that are already there, and fill the gaps. This is not an exercise which is going to cost oodles and oodles of money. Australians bought something in the order of 100,000 EVs last year. That is an expenditure by the citizenry of perhaps $5 billion. Two orders of magnitude less than that is $50 million, and that would be far more than the Victorian government would need to commit to cover every black spot if it chose to. We are not talking about lots and lots of money here.

The CHAIR: Yes, Ms Copsey. One more.

Katherine COPSEY: Just one quick one. We heard I think from a previous witness about the lack of availability about where demand for EVs is coming from in the future. Is that an issue to your knowledge, or do we have a pretty good idea of where people are buying EVs currently and where they are going to in the future? Is there a need for better data to help the government plan for this?

Ross De RANGO: So you are talking about the EV purchasing by postcode – that kind of information?

Katherine COPSEY: Yes, and I suppose by extension people's access to charging facilities.

Ross De RANGO: Sure. So data on where people are registering their vehicles and what the powertrain of the vehicle is: VicRoads publish that stuff at the time of registration. It is public. That data is publicly available for the ACT, New South Wales, Queensland – WA and SA perhaps slightly less so. But for Victoria you can get an Excel file that tells you the registration by postcode of every registered vehicle. I would suggest that data is sufficient for that purpose in terms of what is happening today. With respect to public EV charging infrastructure, that today is delivered by a competitive market in the same way that petrol stations are delivered by a competitive market. The businesses that are deploying that infrastructure are keenly interested in where the EVs are that have need for the equipment. They are not just looking at: is the suburb buying lots of EVs? They are looking at those people who are buying those EVs. What is the housing mix in that postcode? Are they likely to need public charging, or are they likely to do most of their charging at home? They are looking at the major routes. So high-power fast charging in a town like Stawell, for example, which is on the main route from Melbourne to Adelaide, is going to be more necessary than high-power fast charging in a town like Ouyen, which is not on that major route. These sorts of considerations play into the business decisions of the small businesses, the medium businesses and the big businesses that are deploying high-power charging. Certainly, to Mr McIntosh's point earlier, it absolutely plays into the decision-making processes of the big petrol retailers

who have boots on the ground selling fuel there today and will continue to have boots on the ground selling fuel there tomorrow, whether that fuel is hydrocarbon or electrons.

Katherine COPSEY: Thank you.

The CHAIR: Thanks, Ms Copsey. That is all we have time for. Thank you so much for taking the time to appear before us today and for your submission to the inquiry as well. That concludes the public hearing, and all Hansard and broadcast equipment can be turned off.

Committee adjourned.