

TRANSCRIPT

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

WITNESSES

Dr Kazi Hasan, Senior Lecturer and Research Lead, Transport Electrification,

Associate Professor Anne Kallies, and

Associate Professor Zsuzsanna Csereklyei, RMIT University.

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 various lands 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 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.

Katherine COPSEY: Katherine Copsey, Member for Southern Metropolitan.

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

The CHAIR: Georgie Purcell, Member for Northern Victoria.

John BERGER: John Berger, Southern Metro.

Gaëlle BROAD: Hi, I am Gaëlle Broad, Northern Victoria Region.

Tom McINTOSH: Tom McIntosh, Eastern Victoria Region.

The CHAIR: Wonderful. Thanks so much 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 the hearing, and then transcripts will ultimately be made public and posted on the committee's website.

For the Hansard record, could you all please state your full names and the organisation you are appearing on behalf of?

Anne KALLIES: I am Anne Kallies and appearing for RMIT University.

Zsuzsanna CSEREKLYEI: My name is Zsuzsanna Csereklyei. I am appearing also for RMIT University.

Kazi HASAN: I am Kazi Hasan. I am from RMIT University.

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

Kazi HASAN: Thank you so much for this opportunity. I am a Senior Lecturer at RMIT University and I lead the transport electrification research team at RMIT University. Over the last five years I delivered close to \$5 million of research projects. I delivered research projects funded by DEECA – department of energy and climate action – from the Victorian government with the Centre for New Energy Technologies, and we have been collecting two years of electric vehicle charging profiles from 2000 Victorian households to understand the electricity usage by Victorians. I also delivered a research project for RACE CRC that is on the opportunity

assessment, we call it – research opportunity assessment – what type of research is needed on electric vehicles in the future, particularly until 2030. I have done that research and I have been participating in EV research with a few of the councils, particularly where I am living in Wyndham City Council, and we have been analysing the data of electric vehicle usage, where electric vehicle charging should be planned, where the locations should be and how communities are using these types of charging facilities. As part of my work I have been working at the University of Manchester in the UK for five years, and over there I was part of some of the research work collecting electric vehicle usage data. My background is electrical engineering, so my research focus and interest is mostly when EVs are charging, how much energy they are taking, what is the customer preference and what types of grid upgrades are needed. I work a lot with the local Victorian distribution network operators, namely AusNet, CitiPower, Powercor and Jemena. In these projects we try to identify what types of grid amendments are needed. Also as part of my job at RMIT I teach a smart grid course. In that smart grid course, electric vehicles is one of the components we teach to our students. I think that is all for me, and it is a great privilege for me to be here. Thank you so much.

Zsuzsanna CSEREKLYEI: Thank you very much. My name is Zsuzsanna and I am head of the power systems and markets part of the energy network at RMIT. Fundamentally, I am an energy economist. Together with my amazing colleague Anne Kallies we are looking at electricity market design – that is, wholesale market design: how to plan it in the most reasonable way that is minimising system costs. We are looking at network investment requirements. This includes transmission and distribution network investment requirements. We are also looking at how end users and C and I customers behave based on different types of economic policies and stimuli – that is, can we shift customer behaviour with economic incentives, monetary incentives – and how to shift customer behaviour with the right incentives in order to minimise whole-of-system costs. I think these are probably the most relevant for this particular inquiry, especially in terms of: can we implement particular policies or can we implement particular steps that would incentivise customers to act in a way that is best for the whole of the system and best for the whole of society as it is? I will be speaking to these topics.

Anne KALLIES: Okay. Lastly, I am Anne Kallies. I am actually a legal academic, so I would describe myself as being an expert in the law of energy transitions. I work a lot with Zsuzsanna. I am very interested in what legal frameworks enable or provide barriers to transition, including electric vehicle transition of course. My expertise is very much around national electricity market legal frameworks and of course the interfacing legal frameworks for electricity industries in the states as well, in particular in Victoria. I think I have a good overall knowledge of all the other barriers popping up around owners corporation laws and planning laws and all of those. In terms of institutional standing, I am the lead of energy at RMIT's research network, so these two are my theme leads for, again, power systems and markets and of course transport electrification. I think together we represent a good overview of what universities can offer in this space where we have research capability. I also want to say that for your questions five and six we actually pulled in some knowledge from an expert – he is a chemical engineer –

Zsuzsanna CSEREKLYEI: Peter Sherrell.

Anne KALLIES: Yes, Peter Sherrell – who could not come with us but is the expert on the reuse of batteries. So if there is any interest there, we have some comments by him we would like to pass on to the committee. Otherwise, please guide us on whether you want us to have a couple of comments on each of the questions or you just want to fire questions. It is the first time we are doing this.

The CHAIR: Of course. Thank you so much. What we will do is members will ask questions for around 5 minutes each, and then if we have time left, we will go around again if members have more questions. I will kick off with Mr McIntosh.

Tom McINTOSH: Thank you, Chair. Thank you all for being here. Going to the distribution businesses – and we could perhaps touch on retailers – on the distribution networks, what do you see as the best role that they can play or the appropriate role or the pros and cons of how they can be involved in providing electric vehicle charging infrastructure?

Anne KALLIES: Should I kick off on that?

Zsuzsanna CSEREKLYEI: That is yours.

Anne KALLIES: And Kazi might want to add to it as well. They hold the information on their network and their network constraints. The electricity distribution networks will, in whichever capacity, be an important partner here. So they are facilitators. Charging stations do need access to the network, and this will have to be negotiated through access agreements. DNSPs, distribution network service providers, should always be included early in this process. At the moment – and I am sure you will have had submissions around this; I just dipped into a couple – especially for kerbside charging there is a discussion going on about whether this should be owned, if not provided – and there are some fine distinctions as to who exactly does what on a kerbside charger – by the DNSPs. We have a trial just approved by the Australian Energy Regulator in October for CitiPower, Powercor and United Energy, so this kind of –

Tom McINTOSH: There are about 150.

Anne KALLIES: Yes, 100 kerbside chargers. This is an interesting experiment to follow. I do not know how much you know about unbundling and the fact that in the Australian electricity system, of course, we have made a decision that distribution networks, transmission networks, are networks; they are regulated monopolies. They should not be offering any potentially competitive services. They have received a trial waiver from this requirement in order to provide this kerbside charging trial that is basically on their poles. The discussion around this is somewhat – you know, basically the DNSPs are saying, ‘We’re not seeing kerbside charging, pole charging, provided in the right locations.’ The competitive charging services say, ‘Yes, that’s because you’re not telling us what the right locations are.’ So it is this conflict.

Tom McINTOSH: That was going to be my next question. Do you think the DNSPs are acting as a barrier or acting too slowly? That criticism is around.

Anne KALLIES: It depends on who you are asking. I have to say I am slightly agnostic on this. I think Kazi, for example, would say, ‘Let’s keep this separate.’ It is possibly because I do a lot of comparative research. This very strict separation between what a retailer does and what a distribution network does is not a given around the world. New York state is an example where you have mixed providers. Germany has not got a very strict separation there. It is different for transmission networks, but for this kind of grid edge supply we do see models where basically distribution networks are also offering competitive services. It has not been thus for a long time in Victoria. But as we are talking about that, there is also a discussion going on about whether we should be moving to a wider model of what these distributors should or should not be able to do. So I would really hold my fire on that and wait and see what the trial brings, because we have also seen, particularly in Victoria, that enhanced retail competition has not necessarily led to lower retail rates.

Tom McINTOSH: So that would lead you to think that more competition will not necessarily get lower rates and that perhaps the DNSPs could provide the service?

Anne KALLIES: The economists probably think differently, but more competition can also lead to more administration and more people that have to collect overheads for their shareholders.

Tom McINTOSH: We have heard today about different networks with different tech, so if you go to five different chargers you have got to have five different apps and so on and so on.

Anne KALLIES: So let us see. We will get numbers out of that.

Tom McINTOSH: What is the timeframe on that trial?

Anne KALLIES: It is five years.

Tom McINTOSH: Right.

Anne KALLIES: 2031. But they will have to continuously publish their results, their constraints and the uptake.

Tom McINTOSH: I do not know if we have got five years. Can someone just take this conversation and keep it going for me?

The CHAIR: There is time if you want to ask another question, given we have lost a few members.

Tom McINTOSH: Yes. I suppose to follow on, if we are trying to boil down, maybe we will go to the economics of it. In your opinion, do you think consumers will get better outcomes if we divide the DNSPs and the retail or if we bring them together? The distributors say they can do it in one – simpler and quicker – but of course the other side is saying, ‘Well, then we’ve got the monopoly issue, which may not play out for years to come.’ So I am happy if anyone can try and pin where they think – it is hard to know, I guess.

Anne KALLIES: We do not know.

Tom McINTOSH: You do not know. Okay.

Anne KALLIES: I would not be willing to stick my neck out on the numbers there. The evidence is mixed.

Zsuzsanna CSEREKLYEI: The evidence is mixed. There are a lot of things to consider in this particular respect, obviously. I think the DNSPs are owning but are not operating those.

Anne KALLIES: That is correct.

Zsuzsanna CSEREKLYEI: That is right.

Anne KALLIES: But they are maintaining them, which is important to consider because that has been an issue.

Zsuzsanna CSEREKLYEI: Yes. So you are introducing an extra party as the operator next to the owner in this particular case.

Tom McINTOSH: Maybe this can be taken on notice or you could come back later, but if it were to be the distributors, then are there additional regulations or requirements that need to be put on them? I appreciate I am out of time, but perhaps we can explore that later or get it in writing.

Zsuzsanna CSEREKLYEI: DNSP income is strictly regulated by the AER. That means they have to submit their revenue plan on a five-year basis to the Australian Energy Regulator, and the Australian Energy Regulator will be approving what sort of income they may or may not have and how they can recover anything on their regulated asset base. That means if this was to move forward, the DNSPs would be owning any charging or charging infrastructure, and as Anne said, currently this needs a waiver even for the trial phase to go ahead. We have to understand that we are talking here about regulated networks. There would have to be a lot of changes with respect to the AER and how the AER would be handling this. This requires a considerable regulatory change going forward.

Tom McINTOSH: We have heard criticisms about those five-year calculations as well, but anyway, I will let that go.

Zsuzsanna CSEREKLYEI: Yes.

The CHAIR: Thanks, Mr McIntosh. Mr Welch is going to continue on with that line of questioning.

Richard WELCH: This is a bit bipartisan. It is a good line of discussion. I think it is an important one, because on this point of who the retailer is, effectively – the service and who provides the infrastructure – have you done an analysis on the economics of if you put a charging point in place, what is the return on investment and how long does it take to recover the capital cost of that investment?

Zsuzsanna CSEREKLYEI: To us that information is not known currently, mostly because the data has not been available. This is in a very early start-up phase. There are different chargers. We do know that there are some public chargers as well that are operated by private companies and there are chargers that are operated by municipalities, and when you are asking about return on investment on those chargers, it really hinges on so many factors, such as what the price of electricity is that you are paying for and what you are selling it for. Obviously you have some municipalities that would be charging EV users a very different rate, in parts of Melbourne, than, for example, particular private operators would be charging. I think the calculations vary in terms of location also. The network fees might be varying depending on the location and how much you can buy your electricity for and charge for it. That will vary, so we would need to be making a fundamental calculation on that.

Richard WELCH: Yes, but if we are to achieve an efficient market, then the cost of the infrastructure versus the cost of the power coming out of the infrastructure would be in two different marketplaces. So, you know, in overcoming some of the other constraints, where you need five different accounts – theoretically you should need one account.

Zsuzsanna CSEREKLYEI: Yes.

Richard WELCH: You can choose the cheapest provider of the electricity on the day, so that is an efficient market, and there is a return to the infrastructure provider as a standard fee across it. Have you done modelling in that environment?

Zsuzsanna CSEREKLYEI: In this respect we have not done any modelling on this particular question.

Anne KALLIES: Maybe Kazi has.

Kazi HASAN: As I mentioned, I teach a smart grid course, and as part of that course we teach electric vehicle infrastructure – this investment. We have taken a few examples from the USA. When a public charging station provider tries to invest, of course they do a payback period – they consider this five to 10 years. They consider their investment, electricity bills and number of charging customers they expect, and then they try to make it within five to 10 years. Just as an example from Wyndham City Council: they have public charging stations. There are slow public charging stations; they are charging \$0.27 per kilowatt hour. There are fast charging stations; they are charging \$0.54 per kilowatt hour. So of course they have done those calculations on after how many years they will go to the break-even point or see the profit. Usually, as in the USA example I mentioned, they try to keep it within five to 10 years.

Richard WELCH: Do those markets segment the supply of the electricity versus the supply of the equipment? They are two different markets?

Kazi HASAN: Yes, because investment cost and operating cost of course they consider separately.

Richard WELCH: And two different companies? Is that competitive as well?

Kazi HASAN: I am talking about from the investor's perspective. They buy the equipment and of course they need to pay the connection fee for the electricity and bills et cetera, and they try to do that calculation on their behalf.

Richard WELCH: And that five- to 10-year period: is that to be cash flow positive on it, or is that a sustainable equipment renewal level of return?

Kazi HASAN: To go to the cash flow positive, so that – yes.

Richard WELCH: Yes, okay. But it does not necessarily give capital to make the infrastructure renewal – to replace the infrastructure – because what is the life span of the EV charging point, physically?

Kazi HASAN: It could be around 20 to 25 years.

Richard WELCH: Really? That long?

Kazi HASAN: Similar to an EV battery, something like that.

Richard WELCH: Okay.

Kazi HASAN: Yes, that is their lifetime.

Richard WELCH: Really? There are certain movable parts in there that are not consumables?

Kazi HASAN: No, because in the EV charging station itself, it is just an electricity supply.

Richard WELCH: Yes, and it is a cable and it is the electronics inside it.

Kazi HASAN: There is a cable and you just plug it in.

Richard WELCH: And it is whatever tap-on machine you are using and all those sorts of things.

Kazi HASAN: Yes. It is similar to an EV, because for normal vehicles we need every-year servicing, but an EV does not need servicing. Similar to a charging station, there are no moving parts. It is just an electrical point for connection.

Richard WELCH: That is a good stat to know. In terms of your research – and I am not sure which one of you would be best to answer this – there has already been a little bit of a theme in some of the witnesses that we have had today: to move adoption forward, everyone seems to gravitate to the answer being subsidies, and not enough. It does not feel like there is a lot of intellectual weight and labour going into how we make this a really commercially attractive thing so that private investment will just charge towards it. Sorry for the preamble, but there are lots of new technologies, and lots of new technologies do not always need subsidies to be adopted. They get picked up very quickly because they make sense. If we like to think that EVs make sense, have you put much labour into thinking, ‘Okay, how do we make a commercially attractive model so we do not need to subsidise it all the way through?’

Kazi HASAN: Just to clarify, the question is about the EV charging infrastructure?

Zsuzsanna CSEREKLYEI: Or EVs themselves?

Richard WELCH: Sorry, Chair, the time.

The CHAIR: It is so fine.

Richard WELCH: In all the research that we have done, and from the other witnesses we have heard from already, it seems to be a bit of a default mode to say the government must incentivise it or subsidise it.

Kazi HASAN: Is it for the EVs?

Zsuzsanna CSEREKLYEI: Let us just clarify: are we talking about charging infrastructure?

Tom McINTOSH: The charging infrastructure.

Kazi HASAN: Okay.

Richard WELCH: I am sorry. Beg your pardon. Yes, that is right. I am just wondering if as much effort goes into devising market mechanisms rather than government subsidies for the same thing.

Zsuzsanna CSEREKLYEI: Again, for me it comes a little bit back to economics. I probably have to make the declaration that I have looked into many, many things across the electricity network as to the payback period of EV chargers [inaudible]. We can look practically at EV charging stations as if they were normal petrol stations – they are providing a service. Petrol stations also buy their gasoline, and then there is competition as to ‘I am cheaper today than you are in the next suburb,’ so we drive to this petrol station. For any private provider – I mean, you can have council-operated ones. There can be a little bit of a council incentive, where they say, ‘It’s a political decision and I really want to drive it forward.’ At the end of the day, as for large-scale diffusion of any particular technology, it would only work if the investor who is operating that particular charging station is making a profit, because if they are not making a return on their investment, then nobody in their right mind will start investing and putting up charging stations. Obviously once you have those charging stations up it would be helpful if there was competition, because one thing we really do not want is an oligopoly sort of situation with collusion. For those people who do not have access to home-based charging – there are very good home-based charging rates currently available, but not everybody has the luxury to go home in the evening and charge their car or at midday charge their car – they are dependent on public charging. What we would want to be avoiding in the long term in terms of economic benefit is having a market situation where there is a concentrated market power and prices go up for whatever reason.

Richard WELCH: Yes. I will give up my time. I will come back to it. Thank you.

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

Katherine COPSEY: Thank you. I wanted to hear a bit more. You mentioned in your overview about how we can have customer behaviour encouraged that supports the whole system. I am just interested to hear in particular if there are things that you can see over the next five to 10-year period that need assistance in terms of making sure that we have energy supply that meets consumer need, not just as a static-like level of how much electricity we need in Victoria but how much we need at different points in the day and whether EVs can be part of that solution. In answering that, I am particularly interested to hear of the stuff that state government can do in order to influence that and ease it so that everybody gets more of a benefit, not just those who can afford the EV themselves.

Zsuzsanna CSEREKLYEI: That is an excellent question. From my point of view, when I look at transition, whether this is energy transition in transportation such as the adoption of EVs or energy transition in general with respect to networks, network requirements or wholesale market requirements, they are co-dependent. At the end of the day, we have got consumers with solar PVs, and this is causing a situation, particularly in South Australia – currently we have got an interconnector with Victoria that is sort of absorbing the pluses and minuses in South Australia. We have a situation where there is a lot of rooftop solar during the middle of the day and this is decreasing operational demand. That means managing the entire network in terms of voltage is becoming increasingly difficult. Given that we are going ahead with the energy transition, what we would want our customers to do, whether C and I customers or residential customers, is to smooth their consumption in a way that minimises requirements on the system, whether that is distribution network extension requirements or wholesale market extension requirements. Because at the end of the day, if everybody goes home at 6 pm and plugs in their EV, that can increase peak demand twofold or threefold. That would also mean a massive impact on the distribution network. If there is a distribution network extension requirement, then everybody pays, not just the people who have the EVs – all the customers will start paying for the behaviour of EV owners.

From my point of view, this is something that could be addressed with tariffs. Households are very different, based on whether they just have an apartment and an EV at home that they have to charge or whether they have rooftop solar, whether they have batteries and rooftop solar or just batteries. Obviously I have seen quite a bit of an uptake, for example, of home batteries. The New South Wales government has introduced virtual power plant schemes. If you have a home battery with a solar panel, it is a great thing to do because, first of all, you are not pushing your solar electricity onto the grid during the middle of the day when we really do not need that extra solar electricity on the grid. You are storing your electricity, and you can conveniently go home, plug in your EV and use the electricity that you generated during the day. So from my point of view, I do think that appearance of home batteries would be something that would bring convenience to people so that they would not have to charge during the day if they cannot. Because it is great if they can, but not everybody can do it – let us face it. A home battery is something that is actually helping.

Most EV charging tariffs currently in Victoria are overnight charging tariffs. You will see that the really good rates for EVs are usually between midnight to 6 am. Obviously that also has long-term implications because it is fundamentally coal that is generating overnight. In the long run we do not think it is a very wise decision to start increasing demand substantially at a state level overnight –

Katherine COPSEY: When we have got so much during the day.

Zsuzsanna CSEREKLYEI: when we only have coal available and some wind.

Katherine COPSEY: Yes. Great. Do I have time? I have got 23 seconds.

Zsuzsanna CSEREKLYEI: Sorry, I took too long. And anything that – sorry.

Katherine COPSEY: I will come back.

The CHAIR: You have got time for one more. You can ask one more, that is fine.

Katherine COPSEY: I was just interested in the VPP scheme that you mentioned in New South Wales. Where is that up to? What is happening and what kind of regulatory barriers and so on were there to overcome in order to enable that?

Zsuzsanna CSEREKLYEI: I will leave the regulatory barriers for my legal colleague to speak about. Usually the aggregator operates them.

Anne KALLIES: Yes. We have the model available right now. I think almost every electricity customer could sign on. I think the barrier is behavioural, and there is the feeling that ‘I don’t want to give access to my investment’. I think that is kind of the flip side of the highly individualised energy transition we have been running here, where everyone puts their individual subsidised solar panel and battery in and we are not making people think about system impacts. This is where tariffs can help.

You were asking earlier what the state government can do. Obviously a lot of this sits within the multijurisdictional national electricity market framework. This is something I have written on. Theoretically of course the state can opt out of that, but whether that is the best solution or not, we should treat it with caution. As a competitive advantage in Australia – if you come here you are already as an investor operating across multiple legal frameworks in individual states. I am quite a fan of having this nationalised, but in the end it is mirror legislation and the states can and do opt out of parts of that. So that is like the nuclear option.

But you have your smaller levers of enablers. Especially in the apartment context of course, the *Owners Corporation Act* really makes this still very hard here. Where it has changed is ‘Here you need a special resolution if you want to install or retrofit a building with charging infrastructure.’ Seventy-five per cent of owners may really not care or may not show up. So these kinds of smaller levers that can ease the way I think are absolutely worth considering. Similar technical standards – okay, this has changed, I think. For example, for V2G, this is possible now, but these are the smaller things you could do.

Katherine COPSEY: Enabling more brands of charger?

Anne KALLIES: Yes, enabling more brands of charger, higher competition. Some of it is like the National Construction Code of course, with EV-ready buildings. Basically, influencing these types of levers and enablers, I would say, is a useful pathway without having to wade into this somewhat complicated world change process, which can be incredibly slow in the national system. Yes, this is the federal system at work of course.

Zsuzsanna CSEREKLYEI: If I may, I know that we are over time, but obviously I forgot to mention two things. But you probably would have heard the day-to-day, the whole day, time of use and time of export tariffs. I am probably just repeating points that other people would have said previously. We do know that consumers are very, very responsive to both time of use and time of export, as in feed-in tariffs, and that is a very strong steering instrument.

Katherine COPSEY: Great. Thank you.

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

Gaëlle BROAD: Thank you, Chair. Thank you very much for your contribution to this inquiry. I guess I am interested because I represent a regional–rural area – really the north of Victoria. Monash in their submission said uneven access to charging facilities will lead to inequalities. I guess I am just interested if there are any unique challenges in regional and rural areas in being able to access EV charging stations.

Kazi HASAN: We have conducted some data at RMIT with NAGA, that Northern Alliance for Greenhouse Action, with their data, and we have been using public charging station data. Just as a background, as I mentioned, we have analysed a lot of UK data, and we identified that 85 per cent of the people are charging at home. Fifteen per cent only go for public charging stations because of the longer duration of charging. It is their data. But on the other hand, if we go to the USA, we see more public charging because in California and other places they have renewable co-located charging stations. For Australia, I think we can use the USA model because we have a lot of solar generation, so we can use our electric vehicles as a solar sponge.

In terms of the destination charging program that is going on, I think that is a very good initiative, looking at the strategic locations of the highways and different places for charging. Particularly for regional areas, as I mentioned, we have collected 2000 Victorian homes – that includes regional areas as well – and people prefer to charge at home. But there are public charging stations. We have been collecting data from Nillumbik city council. In one of their sports centres there was a public charging station, and that was a fast public charging

station. People prefer charging outside if it is a fast charging station. A slow charging station charges their full vehicle in 8 to 16 hours, whereas a fast public charging station will charge their vehicle in 2 to 4 hours. So they prefer the flexibility. I go to the gym, plug it in, and by the time I come out it is more than half charged. For regional councils, of course there are advantages – there will be low density – but distribution network operators will face challenges to accommodate fast public charging stations,

Similar to many regional areas in Victoria and in the whole of Australia, solar injection – feeding back to the grid – is prohibited or controlled. That will be similar for EV charging stations as well. We do not see this, because in Victoria we have 5.5 million vehicles, and out of that, until today, I think around 50,000 only, or 1.5 per cent, are EVs. So we do not see this yet, but we need to plan for that.

Gaelle BROAD: I understand that fast charging stations – we heard earlier – are a lot more expensive than the slow. Do you know a cost – how much it is per charging station? What is the difference?

Kazi HASAN: No, unfortunately I do not know that exactly, the infrastructure cost.

Gaelle BROAD: If I can just ask another question. The state government from 1 July 2025 wanted all public transport buses to be electric. That has presented a number of challenges for regional areas, because they do not always go back to a depot, and they do not have access to three-phase power. Do you have any insights into the impact on the bus network for EVs?

Zsuzsanna CSEREKLYEI: Everyone is looking at me. We have done some studies, actually. It was also part of the Monash submission – that was an RMIT and Monash study together. We have looked at, in particular, Victoria. We looked in particular at the Melbourne metropolitan network. Obviously in the Melbourne metropolitan network it is possible for the buses to go back to one or another depot, so this particular issue has not been represented as a problem. There are other ways of charging buses, not just going back to the depot and plugging in. Particularly –

Gaelle BROAD: I guess in regional areas, it can be that the bus driver takes a car to get to the bus. But has there been any research on regional areas specifically?

Zsuzsanna CSEREKLYEI: Not to my knowledge, but we can look into this for the future. I also would like to mention that I have been talking to a lot of people who are already on the fringe of Melbourne going outward, and very often they – and I know that this inquiry is about EVs – go for a hybrid. And the reason they go for a hybrid is exactly this range anxiety, that they have to drive 3 or 4 hours into rural Victoria, out of the city. And they say, ‘Well, with three children in the back seat of my car, I can’t stop and recharge for an hour, whether or not there will be a charging station.’ So this is definitely a challenging infrastructure problem. It is much easier to implement it in metro Melbourne than in other areas.

Gaelle BROAD: Thank you.

The CHAIR: Thanks, Mrs Broad. Mr Berger.

John BERGER: Thank you, Chair, and thank you all for your appearance this afternoon. Anne, I wonder if I could direct this question to you. You spoke about the legal frameworks. What would be useful for us as a committee to understand what those legal frameworks are in terms of barriers and then possible solutions that might be included in the report that might be useful?

Anne KALLIES: Yes, that is a good point. I think we always have a tendency to look to the one solution, but this needs to be a more holistic picture of ‘what are all the frameworks interfacing with this?’. One of them is actually transport, and we have not even talked about that. I am not a transport expert, but we currently do not have particularly good mechanisms to co-plan electricity and transport frameworks. I think this will need to happen going forward.

But in terms of how you participate in the electricity system, when we plug in, we are part of a shared, socialised system. This is, for Victoria, largely sitting in a multijurisdictional framework, the national electricity market legal framework, where all participating states have signed on and basically passed the same bit of legislation with a whole lot of different opt-outs depending on what their particular state interests are. That is number one; that basically tells you how you participate in the electricity market – the networks sit there; how

networks invest and the mechanisms to set tariffs and so on sit there. Overlaying that, of course, we have the Victorian *Electricity Industry Act*, which basically says if you want to distribute electricity or sell electricity or generate electricity, you need a licence, unless you have an exemption. So there is this framework which kind of overlaps quite heavily in terms of content with the multijurisdictional framework of the national electricity market. Those are the big ones we often talk about.

The Victorian government already have quite a lot of levers in their *Electricity Industry Act* to make their own regulations or changes to opt out of the NEM, National Electricity Market, framework, if they think it is opportune. I would say six years ago people were shocked when this happened, but now we see almost all states seem to be doing this quite selectively when it suits their state interests. Beyond that, the other levers that really sit with the state government – planning law, owners corporation laws – in Victoria in particular in the planning law legal framework, a lot has happened already. These changes have been made. Electric vehicle charging stations usually do not need a planning permit unless you are in a heritage overlay area and it is very visible. I think a lot of these levers have already been used. The next one for me would be property – owners corporation law.

There are also things in terms of technical standards. It is not exactly my area, and this sounds legal but is not quite. I think that the engineers said that somewhere centrally. I do not think that is a state responsibility. I do not know if Kazi wants to add anything there. Again, that is another interesting little lever that we often do not talk about, but it enables.

What really only strictly sits with the state is your planning and your property/owners corporation laws, which I think are underdiscussed in this space as potential. You can privilege EV charging in multiresidential buildings. The Germans just said, ‘If a renter wants it, you cannot say no unless it’s a problem for your whole system and it will crash everyone else.’ Just put that in the Act. It is possible. There will be a lot of owners I think that will not be particularly happy with that, but there are options there, and you can see how other countries have done that.

In terms of technical standards, do you have anything there about who sets them and how that works?

Kazi HASAN: No, not at this point.

John BERGER: Thanks, Chair.

The CHAIR: Thanks, Mr Berger. I think we have another question from Ms Copsey, Mr Welch and Mr McIntosh, which we can accommodate. Let us just try and keep it brief, starting with Ms Copsey.

Katherine COPSEY: Sure. I think what I heard was it sounds like you do not have a lot of expertise around technical barriers. I am really interested in charger types and, with the burgeoning market of more EVs that are becoming available to participants, whether there are things that need to change at a national or state level in order to enable households to have effective vehicle-to-grid charging, and how we can boost uptake of that at the household level so that then there is ability to go beyond the household in terms of the energy that can be kept in the car and released from the car. Are there barriers around the standards for chargers at household level or the brands that are available to people that are hindering that?

Kazi HASAN: In Victoria each household has the capacity of 5 to 7 kilowatts, which can cater to the needs of a level 1 charger only. Level 2 chargers go to 22 kilowatts on a three-phase connection. That is not possible in homes.

Tom McINTOSH: Sorry, without an upgrade, perhaps? Three-phase can be pulled into the home.

Kazi HASAN: But not for normal – that is for a villa or big land. If every household wants to have an upgrade, then the distribution network operator needs to change the whole infrastructure for that, which is very costly, of course. Then that cost will come back again on the ratepayers, so they do not do these upgrades. Because we are mostly discussing the public charging infrastructure for Victoria particularly or generally for Australia, that is destination charging or workplace charging. All of the people that are in Melbourne today that came for work will stay in their respective workplaces 5 to 8 hours. If we can facilitate solar PV or those types of facilities and public charging stations as much as possible in these building facilities or on the roadside or in the car park –

Katherine COPSEY: Commuter car parks, shopping centres.

Kazi HASAN: or wherever, I think that will solve this problem in the future. Of course state government can play a role in this. I think, for us, solar sponge charging should be the future and that should be our plan, because once we go home then it is not possible to charge; it is peak hours, but late night is possible. So that is, I think, one issue I try to highlight here.

Katherine COPSEY: Middle of the day is preferable, so how can we facilitate that? Yes. Thank you.

The CHAIR: Thanks, Ms Copsey. Mr Welch.

Richard WELCH: Thank you. A short follow-up: in other jurisdictions – and I am thinking particularly of London, from personal experience – most people do not have driveways, so almost all the charging is in the streets there. They seem to have been able to roll it out in quite short order, actually; four or five years ago now, probably more – six or seven years ago – they did it. What are the parallels? Why couldn't we replicate what they have done? What is different about Victoria that means we cannot replicate it?

Anne KALLIES: This is hearsay for me, apparently, and this is the question again about the role of the DNSP connection agreements. If we could standardise them, that would be helpful. At the moment every charging station – hopefully – will have to negotiate individual access to the network. Word of mouth is it is a major hold-up. I think the other thing is at the moment the market is not quite there yet. I mean, what did you say, 50,000?

Kazi HASAN: Yes.

Anne KALLIES: There is a bit of a chicken–egg, 'build it they will come' question here – what needs to come first? Again, I would not say I have done particular research about what enabled the UK uptake. Kazi may have given he was there.

Kazi HASAN: Currently 10 per cent of vehicles sold are fully EV all around Australia. ACT is a little bit ahead, but all other states are something similar at this stage. Last year we had 30,000 EVs in Victoria; this year – mid last year to this year – I think they sold around 10,000 more. So because of these issues, as I mentioned at some point, with that charger infrastructure they need to consider how many vehicles will come and charge, because if this is underutilised then their investment will not return.

Richard WELCH: There is a definite loss leader element to it. In the UK, though, they seemed to sign long term contracts that allowed for loss leader to be viable. I do not know how much subsidy, if any, was part of that, but it seemed to me a very market-led implementation, and then it was rapid because there was that investment certainty. What I would be curious about – and whether or not you can provide that is okay – is how is our regulatory structure in Victoria so different that we cannot mimic that in some way or form at the source?

Kazi HASAN: I think the answer remains in your question. As you mentioned, in London they do not have access to their own garages. They must stay on the street.

Richard WELCH: But there is one in every second suburban street.

Kazi HASAN: But we have the luxury of a large double car garage in our home, so why would we come to the street?

Richard WELCH: Because it is a better way to socialise the cost than to concentrate it and make it more equitable and to sweat the capital more because it will have more utility in the street.

Kazi HASAN: With the percentage of EV uptake, I think people will be reliant on public charging stations, and then we can maybe see that these businesses are viable.

Richard WELCH: I am not accusing you of anything, but have you done comparative studies of that nature?

Anne KALLIES: Not specifically on that, but I am taking notes. It is these kinds of ideas, yes.

Zsuzsanna CSEREKLYEI: I have a question with respect to Mr Welch's question. I might need Anne's confirmation on this, but I think the UK even allows that if you have either a car battery or a home battery and the DNSP is requiring input from you in a very localised area, say from Smith Street to Jones Street, 'I will need this much between 6:30 pm to 7 pm back to the grid,' that is possible through, I think, different types of companies now that are operating. So the UK is ahead of us in so many ways in integrating EVs both in terms of the charger development as well as whether or not they can provide electricity back to the grid. Am I correct there?

Anne KALLIES: I do not know – that is my short answer here. I have not looked into this in particular.

Tom McINTOSH: Can I follow on from Mr Welsh?

The CHAIR: That is good timing. You are next.

Tom McINTOSH: I think it is a good point he raises. Do we need to make it faster and perhaps have a bit more compliance on the distribution networks – that when there is a request for a fast charger they provide it and, if not, as we heard earlier today, be very clear where the grid can service? Then retailers or whoever is going to install – private companies – can look at it and say, 'Okay, here is somewhere I can hook in,' so that if they put in a request it is serviced within 10 days, 30 days or whatever. We take out the cost and the complication to private investors trying to get this grid going.

Anne KALLIES: Yes.

Tom McINTOSH: Okay, great.

Anne KALLIES: And the point is we have that for the transmission network with the integrated system plan where they are identifying opportunities, but we do not yet have it for the distribution networks. Currently there is an AEMC review underway on whether we need this type of integrated system plan for distribution.

Tom McINTOSH: Get on and get it done.

Anne KALLIES: It is a lot more complicated in terms of, I think, purely the electrics of it than for the big picture.

Tom McINTOSH: Yes. But that is where I think if you identify where the availability is up-front –

Anne KALLIES: Exactly. That should be shared and transparent.

Tom McINTOSH: Yes.

Kazi HASAN: We might think it is a local problem, supply at that point, but it is actually a whole system problem. So we delivered a \$3 million project funded by the Victorian government, the C4NET centre and all five Victorian universities and all DNSPs together to design the grid for 2040 for Victoria. The project is called ESPV, Enhanced System Planning Victoria. We will look at the whole grid, because DNSPs need to provide the supply and maintain the voltage level et cetera, so they cannot just give permission to a particular point, because the power needs to flow. If I need my pond to be full from the river, the water has to come from the sea and the whole supply chain and channel has to be safe. So the problem is that if they want to give higher supply at a particular point, somewhere the transformer will be overloaded and they will need to change the transformer, which will cost again \$20 million for them or \$5 million for them. That is what they are trying to see. The DNSPs have the full visibility, and that is why they are making their plan.

Just one point in 15 or 20 seconds: when I worked with city councils, they wanted to invest in public charging stations, but they do not know in which part of their network people are buying EVs, because that data is not with them. They do not have access to that data.

Tom McINTOSH: Very, very quickly, it is good we are talking about grid kerbside. Are we letting our service stations that are current networks off the hook, particularly out in regional areas when we have got tourists or people travelling? Should we be expecting more from our big BPs, Mobils, Ampols and Caltex – that they put in some EV infrastructure so people are not getting stuck and stranded, which is increasing range anxiety?

Anne KALLIES: You will be breaking the hearts of the small start-up EV infrastructure providers if you give that to the big ones.

Tom McINTOSH: I will put it this way: are they risking their future by not getting into it?

Anne KALLIES: Personal opinion, yes. That is all. But have I done research on that? No.

Kazi HASAN: That is a stranded asset risk, isn't it? For a holiday for five days, why would you invest that much money on five chargers? That is for Christmas.

Tom McINTOSH: So their shareholders have to be aware that there is a big market they are going to miss out on and not be open to.

The CHAIR: All right. Thanks everyone. That is all we have time for. Thank you very much for taking the time to appear before us today and answering all of our questions. That concludes the public hearing.

Witnesses withdrew.