T R A N S C R I P T

LEGISLATIVE COUNCIL ENVIRONMENT AND PLANNING COMMITTEE

Inquiry into Renewable Energy in Victoria

Melbourne—Wednesday, 16 March 2022

MEMBERS

Ms Sonja Terpstra—Chair
Mr Clifford Hayes—Deputy Chair
Dr Matthew Bach
Ms Melina Bath
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Mr Stuart Grimley
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Ms Cathrine Burnett-Wake
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Mr David Davis
Dr Tien Kieu
Mrs Beverley McArthur
Mr Tim Quilty
Mr Gordon Rich-Phillips

WITNESSES *(via videoconference)*

Mr Ben Skinner, General Manager, Policy and Research,

Mr Peter Brook, Wholesale Policy Manager, Australian Energy Council.

The CHAIR: I declare open the Legislative Council Environment and Planning Committee's public hearing for the Inquiry into Renewable Energy in Victoria. 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 would also like to welcome any members of the public who may be watching these proceedings via the live broadcast.

At this point I will take the opportunity to introduce committee members to you. My name is Sonja Terpstra. I am the Chair of the Environment and Planning Committee. Also appearing with us via Zoom from various lands today we have Mr Clifford Hayes, Dr Matthew Bach, Dr Samantha Ratnam, Mrs Bev McArthur and Mr Stuart Grimley, and other members may also join us momentarily throughout the course of the hearing today as well.

All evidence that is taken today is protected by parliamentary privilege as provided by the *Constitution Act 1975* and further subject to the provisions of the Legislative Council's standing orders. Therefore the information you provide during the 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. Transcripts will ultimately be made public and posted on the committee's website.

If I can ask each of you now—I will come to you in turn—if you could please for the Hansard record just state your name and the organisation you are appearing on behalf of. Perhaps, Ben, we will start with you.

Mr SKINNER: Ben Skinner. I am appearing on behalf of the Australian Energy Council. I am the General Manager of Policy for the Australian Energy Council.

The CHAIR: Great. Thank you. Peter.

Mr BROOK: Peter James Brook, Wholesale Policy Manager for the Australian Energy Council.

The CHAIR: Great. Thank you. With that I will invite you now to make your opening remarks, but if you could keep it to about 10 or 15 minutes, that way it will allow plenty of opportunity for committee members to ask questions of you. All right. With that, over to you. Thanks very much, Ben and Peter.

Mr SKINNER: Thank you, Chair. I would also like to pay my respects to the traditional owners of this land.

To clarify who the Australian Energy Council is, the AEC is the peak body for 20 energy businesses, from large to small, who provide the majority of Australia's electricity generation across the country and close to the entirety, I would say, of electricity and gas retailing directly to customers. Obviously within our membership we have traditional generation sources in terms of fossil fuels and hydro generation, but we also have members that directly own, operate or are contracted to the vast majority of wind and large-scale solar generation in Australia. Just to clarify where we sit compared to other peak bodies, since you will be engaging with Energy Networks Australia—that is ENA—they look after monopoly network businesses, and the Clean Energy Council, the CEC, who I believe you will be hearing from later today. They represent the developers of renewable energy sources rather than the operators and the retailers of energy. Also, I believe you are meeting APPEA, which represents in this context gas producers.

Firstly, the AEC and its predecessors have strongly supported action on climate change within its sector and across the economy as a whole consistently. For example, our predecessor, which was the Energy Supply Association of Australia, was possibly the only large one of the major industry groups who opposed the repeal of the national carbon price back in 2014, and we are very proud of our position in that regard and our consistency in that regard. As an example of that, in early 2020 we recommended that Australia should adopt a net zero by 2050 position. I am pleased to say that obviously convinced the federal government by the end of last year, so we now have it as a national policy—and a bipartisan policy. We went a bit further after we put the submission in that you are reading. We have proposed an interim target to get us along that path to net zero of 55 per cent reduction from 2005 levels by the year 2035. I will provide a little bit more information on that later on.

You may be a bit surprised by these climate ambitions considering that some of our members still operate, although it is declining, coal-fired generation. It is still a very large part of the electricity sector but declining very rapidly. I can assure you that our members expect to be part of and maintain their business operations and retain many customers and serve their own customers through the energy transition. We strongly believe that our customers' interests, and I guess our own interests—but ultimately Australia's national economic interests—are best served through good national policy that reduces carbon at the least national cost. I mean that should be fairly self-evident, I guess.

But I want to emphasise that the electricity sector right now is going through an extraordinary transition at an incredible rate. Now, that is to be welcomed, but the rate is presenting challenges on many, many fronts. We are making great strides in reducing carbon. If you just look at the table on page 2 of the submission, which shows how much electricity is reducing its emissions by, projected within eight years to be less than half of what it was at the start of this journey, it is incredible that such an industry, that has been built up over a century with billions of dollars involved, is going through such a transition at such a rate. But in doing so, it is also an incredibly technically complicated industry and an essential service, so in going through at that sort of rate there are huge risks.

I am pleased to say that there are a lot of dedicated people, both within our membership but also in the national institutions, who will see us through this extraordinary transition and I think will be successful in keeping the lights on and trying to keep the prices at a reasonable sort of level. But you have got to be very much aware that when you are going through such a transition at this sort of rate, you are taking lots of risks and things can go awry, and if you try to accelerate it even further, there are considerable risks on this front.

Visual presentation.

Mr SKINNER: The next thing: I am going to try putting up a slide here that should hopefully just quickly work just to emphasise a point that I want to make about what our industry is doing, particularly in comparison to others. So you should hopefully just see that very simple slide now which just shows that there you have got the electricity, as I have just described, reducing its emissions, effectively halving it over an extraordinarily short period of time whilst all the other sectors are basically flat. So I will just pull that one off.

And as you look down that table in your submission there are some really quite shameful stories there. We have got transport, for example, substantially increasing—20 per cent increasing—in the first couple of decades of this century, and stationary energy, which is basically the natural gas that goes into warming buildings, has in fact been increasing as well, or at least it is certainly not decreasing. So this, I think, is a real shame, because all of the carbon adds up, and why are we so obsessed at this time with one particular sector which is making such extraordinary efforts and is in fact declining? It is already declining at a remarkable rate, and the focus really needs to be on those others that have not made that effort at this point.

But there is also potentially good news here, because these sectors, particularly those two that I just mentioned, really do have viable options in the short term, and quite cost-effective options, to look at substantially reducing their emissions, in particular transport getting away from liquid fuel, particularly light transport in the short term, and stationary energy, that is natural gas in buildings, which has very much got the opportunity in terms of moving to a very high efficiency heat pump type technology.

And in this regard we are very much supportive of the Victorian government's line of work, which has already shown through its modelling that in fact for small customers it is actually economically rational right now to

simply switch over, away from natural gas, for the purposes of heating hot water and small buildings. And most of them already have the capability to do that. It is really just the lack of knowledge as to this not being taken on. And the thing I do have to emphasise is even whilst the electricity system is not fully decarbonised—it will be soon, according to those graphs I just showed you—the greater thermodynamic advantages of using heat pumps and using electric vehicles means that the carbon emissions that you can presently get out of those technologies is considerably less than the fossil fuel direct alternative, that is the combustion alternative.

So we are certainly supportive of the government's work in the gas area, and we think it really can be accelerated. And hopefully other states will follow that through. And we also think that although electric vehicles are starting to take traction—and they are certainly attractive in terms of many of the producers—we believe that there are many options for more supportive policies in terms of rolling that out.

I will come back to that point I made earlier about a 55 per cent reduction by 2035. So why did we suggest this when most others who are talking about interim targets are generally selecting a 2030 target? 2030 was chosen as a pivot point for a lot of people back at the time of the Paris conference, back in 2015, when it was still a good 16 years away. We think that 2030 is now too close, and the problem with putting too much focus on 2030 is that if you do wish to accelerate by that time, there is really only one industry that has really got carbon reduction clearly in action at the moment, and that is the electricity sector. And for the reasons I said before there are great risks in trying to accelerate that even faster in the very short term. So we have suggested a few more years to at least allow those other two sectors, which we believe really do have options, to start to participate and to really play a part in that role. Also, our focus on 55 per cent by 2035 is pretty much halfway, both in time and in volume, in terms of getting to net zero.

The harder to abate sectors—things in agriculture, in certain areas of transport, cement—they are certainly for that second half of that, if you like, the second 15-year period in the lead-up to 2050. Okay. You would have read through the submission. That is consistent with our national focus and our long-term view. We emphasise that we do have a national market that is operating in electricity and in gas, but principally we think about electricity, and we think that climate policy belongs at the national level. Whilst we would be the last people to say that the climate policy that has been coming out of Canberra has been ideal, we would emphasise that Victoria should be putting its voice towards getting improved policies out of the national polity, because that is ultimately how Australia is going to reduce its emissions. We very much caution against unilateral, subnational actions, and I have listed in the submission, I think on page 3, four fairly obvious, self-evident reasons why subnational action is second best.

Finally, we talk a bit about renewable energy underwriting arrangements. Victoria, and to some extent New South Wales, have gone into unilateral underwriting arrangements with large-scale renewable energy. We believe it is problematic on many fronts to go down that path. Firstly, it distorts the market signals of what should be the most efficient investments that should arise in a market in the most efficient locations. Secondly, it tends to move risks downstream from investors to taxpayers or customers. With the Victorian renewable options, the risks are being put on Victorian taxpayers. In some of the New South Wales arrangements they have been put across to electricity consumers. The whole reason why we have a market, and we had it introduced in the 1990s, is to really go in the other direction—to try to make those who are making the investments take the risks of those investments being valuable to customers or not being valuable to customers, so we can avoid some of the, I guess, regretted decisions that were made in the 80s and 90s in terms of poor investments in our sector. They confuse market investors, these sorts of underwriting schemes. You are trying to invest in a market where you think you understand the rules and you are finding that governments are continually intervening by promoting their own arrangements under their own particular desires. So as you can imagine, it adds great risk to trying to invest in this market. And finally, the exposures that are taken on by taxpayers or by consumers in these things are uncapped, and depending on the way these things work out—we do not really know—they can be potentially enormous and quite regretted down the track. They may not be immediately regretted but they will be regretted in time.

We do make a reference to transmission, and we do not deny that everybody seems to find it frustrating trying to build it and there is congestion that you inevitably feel. It does take time. It is very challenging and very controversial, and there are lots of impacts on individuals. We do have national institutions, such AEMO, who have responsibilities in the world of building transmission, and the AER, the regulator, in terms of ensuring cost-effectiveness in that transmission, and we do caution against taking subnational actions, which just simply

are not going to resolve those difficulties and frustrations; they are just going to simply add to it and add to the complexity for those national institutions trying to do their jobs.

Rooftop solar is a very great success story in Australia, but as I have pointed out in the submission, we are getting to a point of saturation now in terms of rooftop solar. It is not having the environmental benefits that it originally did—at least in terms of additional. They have had environmental benefits, the investments that have been made to date in terms of the current solar fleet, but adding to that is not necessarily going to provide further environmental benefits going forward, and so we do encourage rethinking of subsidy arrangements to support additional investment in that area.

And then finally we would say that the net zero task across the economy is the ultimate objective—in fact the only objective, really—and that renewable energy will continue to grow, whatever policies we have in place, because the costs with respect to it are just leading us in that direction. But it does not necessarily go all the way to 100 per cent renewable energy in electricity. There are some things about the terms of reference that do concern me somewhat, because it is a bit of a misunderstanding that our objective is to get to an absolute 100 per cent renewable energy. As many experts have shown, actually a much better way of decarbonising is to target a high level of renewable energy—it might even be in the 90s—but to be prepared on occasion to call on fossil fuel sources as backup, such as natural gas or even liquid fuel, and even, if necessary, use carbon sequestration to offset those emissions. That is all I was going to cover—thank you, Chair—in terms of my introduction.

The CHAIR: Great. Thanks very much, Ben. All right. Over to questions from committee members. Perhaps we might start with Dr Ratnam.

Dr RATNAM: Thank you, Chair. Thank you, Ben, for that presentation, and Peter, for being here as well. I guess at the outset: I share your frustration at the lack of federal policy and leadership and consistency that has led to a lot of subnational actors needing to think about how they address this issue and support their communities who want more drastic climate action. I do disagree with you, though, about the power of subnational action, because I think what we have seen right across the world is that with the failure of federal action the subnational action is the thing that has piloted and created the innovation and often the investment streams that have driven the pressure upwards. That is a philosophical and political debate for another day perhaps, but I disagree with you on that point.

In regard to your submission, what you have referenced today as well, you identified ways that we can reduce emissions faster—so uptake of efficient heat pumps to replace gas, for example; uptake of electric vehicles; and you talked about the transport sector needing to do its job too, which I agree about. I note that you advocate for national solutions, but this is a Victorian-focused inquiry. A number of us believe that state actions are really important as well and have already proven to reduce our reliance on fossil fuels and reduce emissions. From your perspective what interventions in Victoria could make it easier to accelerate these two solutions? So particularly heat pumps to replace gas and the uptake of electric vehicles—are they solutions at a state level that you could suggest that the committee take up?

Mr SKINNER: Well, in terms of the natural gas, I mentioned earlier that we are very supportive of the current review that is occurring in terms of the role of gas, and I think pretty much all of the direction that is coming out of that review does look correct and appropriate. That review at this stage is still being held in the technical environment, and the government will develop policies in response to that. Assuming that the numbers fall out the way that they are going at the present time, the obvious interpretations relate to, I guess, immediately discouraging new consumption of gas, so that would be in terms of new reticulations. But we would go further and talk to considering that new-for-old replacements of gas appliances need to be focused on, and in particular in terms of resolving some of the informational barriers that seem to be apparent, because there are actually quite a lot of options for consumers right now to save themselves money with existing appliances. And why are they not doing it? It is probably just because of an informational problem. So there is quite a bit there that I think the Victorian government could probably do. And yes, I would admit that does sound a little bit contradictory to my other comments about national policy, but—

Mr BROOK: Yes, but Ben, in fairness, we have submitted to quite a lot of consultations, and I note that I think the Victorian government has $250 million, or $400 million, set aside for low-income households to degasify. As Ben pointed out, it is sort of an informational issue, but yes, particularly at the lower end of the

market, they need help to degasify. But a word of note in terms of unilateral policy, as Ben pointed out, in one of our submissions to I think Vic infrastructure or Infrastructure Vic, basically for householders within the space of one year when the ACT did a power purchase agreement on renewables, all of a sudden the biggest part of their bill was subsidising that power purchase agreement. It was bigger than the network cost and the energy cost. So you have got to be wary of being overzealous with policy. But the gas substitution work that DELWP is doing, Ben and I both concur: it is good work—it is really good work—and Victoria is very challenging because we have 2 million gas customers, and to many people it is somewhat of an emotional attachment.

Mr SKINNER: Samantha, I would probably struggle a bit on your question about electric vehicles and particular policies to promote. I am not the expert on that area, unfortunately.

Dr RATNAM: Fair enough.

Mr SKINNER: But I understand that there are certainly roles for government in terms of—

Mr BROOK: I can talk to that, Ben.

Mr SKINNER: Yes, sure. Go for it, Peter.

Mr BROOK: Look, up in Queensland, when I was working for Queensland Treasury Corporation, we did a very, very big study on electric vehicles. We spoke to all the manufacturers, the charging people, everything. What we were trying to do was to convince the government to actually get them into their fleet, into the government fleet,

Dr RATNAM: Yes.

Mr BROOK: Now, the thing with EVs is: if you get them into a government fleet, firstly, all of a sudden each vehicle is probably being driven by 30, 40 different people, and straightaway they start to go, 'Hey, these things are pretty good. They're actually quite powerful. They're more powerful than my car'. And then also what you do is you build a second-hand market for complete turnover. Sadly Queensland did not adopt that recommendation. But in terms of subsidising EVs, I do not think we should do that. In the States they subsidise EVs, Norway subsidises them, but you have got to bear in mind they are kind of subsidising their own manufacturing industries, whereas as an importer of vehicles we should not subsidise them, but we just need to reduce the barriers and start to get more vehicles out there through the government fleet. Look, there was that bizarre thing in Victoria where you actually put a tax on electric vehicles coming from a particular member of Parliament—whatever. The other critical thing is charging stations.

Dr RATNAM: Great. Thank you. I will come back if there is more time, but I am happy to leave it there. Thank you very much.

The CHAIR: Come back around. Just on that: that is not true. We did not put a tax on vehicles. That is not true.

Dr RATNAM: You did.

The CHAIR: No, sorry, Dr Ratnam, we did not. The other thing is: all of that is going to build the infrastructure that we need that you just talked about. The Victorian government is also—you made your point about the Queensland government—creating a second-hand market by turning over the government fleet to EVs. I just wanted to clarify that because I am not sure whether you knew that about the Victorian government's approach on EVs. We will go to Mrs McArthur now for a question.

Mrs McARTHUR: Thank you very much, Chair. I just want to clarify this notion that seems to be perpetrated that natural gas is being used for domestic heating. Of course you would be aware that gas is vitally needed in the manufacturing industry in rural Victoria, in my electorate particularly. We could not have the drying of milk or the kiln drying of timber or some of the abattoir exercises without gas. Electricity does not cut it. So while you might want to suggest every household moves over to a heat pump or reverse-cycle electric, currently using brown energy, what do you propose for industry to transition from gas—that requires a particular form of heating which gas supplies?

Mr BROOK: It is a very good question, Beverley. As we have opined in a number of our submissions, we are sort of talking about degasification in terms of just the household and commercial sort of sectors. But we have always made it very, very clear that there are a lot of industrial applications where it is not applicable. You do need methane for those situations, and they are going to be the hardest parts to actually degasify. Now, moving forward, say, five years hence biomethane may become more available. Australia is actually quite lagging compared to countries like the US and Europe, where they really are utilising a lot of biomass to create that. Yes, we definitely see that you are talking about dairies, but also really extreme high-heat applications. Perhaps down the track, maybe past 2030, there might be hydrogen applications in terms of steelmaking, for example. So, yes, we are very aware of that, and we are not saying, 'No gas to anyone'. It is sort of what is currently available to take people off gas more efficiently and reduce emissions, but those applications we are very aware of.

Mr SKINNER: I will add to that, Beverley. It is a very good question, and what Peter said is correct. The easiest way to think about it is that we see the role of heat pump type technology as being extremely useful for carbon reduction in terms of low-intensity heat sources. So whenever you have got a temperature requirement below about 60 degrees, heat pump is all over gas I am afraid at the moment. But the sorts of uses that you are referring to relate to the production of steam, which does require temperatures in excess of 100 degrees. Whilst electricity can do that, at this moment it is not economic to do it. We see that as being more or less a post-2035 type of journey, and it could well be that that is going to be the place in future for a renewable hydrogen to participate.

One of the attractions about all of that that is worth reflecting on is that those large customers are generally connected to the transmission grid of gas or at least the very high pressure gas pipelines, whereas it is largely all of those former applications that are connected to the low-pressure gas pipelines. I think this really does give you an indication as to what perhaps the future of the gas network might be. We might be able to avoid having large amounts of gas pipes in the ground, because of where the applications happen to exist that will require gas for longer.

Mrs McARTHUR: Thank you very much for that. I am glad you have clarified that intensive heat is required in industries like milk powder drying and kiln drying timber et cetera. It is vital that those industries not be lumped in with an idea that you can do away with gas.

I am also just interested in where you see your role in other commercial applications, because we have currently got situations where, for instance, dairies are operating on diesel generators because there is no three-phase power in some areas and a single SWER line is just not acceptable when you are trying to run multiple cooling systems and milling procedures, irrigation systems and milking plants. Are you intending to ensure that those areas throughout rural Victoria are able to be connected to three-phase power so that they can move away from diesel generators?

Mr SKINNER: Okay. Well, on this one just a reminder that we are the AEC. The particular industry peak body that represents the electricity distribution businesses is Energy Networks Australia, ENA, so we are not directly involved in that. But if I can perhaps broaden the question, it is often challenged as to whether or not the network has to be substantially reinforced if the state moves substantially from gas across to electricity. Now, in terms of those rural industrial applications, I have not really put my mind to it in the past, but just be aware of what I said earlier: that that is something for further down the track. We are not anticipating that as one of the short-term activities. So one would think that if electrification is the pathway there—and maybe hydrogen, who knows—if it is to be electricity, then I would presume there would be plenty of time to resolve those issues that you refer to.

In terms of the broader consumption of electricity, say, for residential homes and so forth, one of the great attractions we have, or pieces of good fortune, is that of course the power system is built for the summer condition, which has historically been the higher demand. It is also the more difficult time to produce and to transmit electricity, in hot weather. The cold weather ratings of transition networks are much higher than the hot weather ratings. So that gives us a great deal of freeboard, if you like, in terms of the capacity of the network to handle an increase in winter load that would be expected as we move across away from gas.

But I do also want to emphasise that because we are talking about heat pump technology we are talking about remarkable efficiency levels—as in, they generally only have to consume about 1 gigajoule, or sorry, I should

say 1 kilowatt hour of electricity in order to create about 5 kilowatt hours, and convert that to gigajoules if you like, of heat. Whereas in terms of gas, you are actually coming down from something more like about 10 kilowatt hours of gas, because you lose so much when you are burning it to get to the same amount of heat production.

Mr BROOK: But, Beverley, just to reiterate Ben's point: yes, it is a network issue. It is the distributor in those regions and whether or not they are prepared to actually do the capex to put in adequate lines, because I am very familiar with SWER lines myself, and they are not that great.

Mrs McARTHUR: Exactly.

The CHAIR: I have to move along, because we have got other questioners who would like to ask you a question, but if we have extra time, we will come back around. Mr Hayes, over to you.

Mr HAYES: Thanks, Chair. Yes, I have got two questions. One is a bit out there and the other one is more to your submission, but I will try the out there one first. Talking about promoting electric vehicles, and I am very keen on that, do you see a possibility, since we have got all the raw materials for battery production and a lot of those rare-earth metals available in Australia, or do you see any future for a production industry in Australia of electric vehicles?

Mr BROOK: Would you like me to take that, Ben?

Mr SKINNER: Go for it, Peter. It is certainly not an area I am familiar with.

Mr BROOK: Okay, sure. Look, in terms of what you are talking about—is it Clifford? Sorry.

Mr HAYES: Yes, it is.

Mr BROOK: Look, WA for example is one of the world's biggest lithium producers, and they have basically been selling hard-rock lithium and getting about $900 a tonne type thing. Now they have actually invested in turning it into lithium hydroxide, which makes the value now $10 000. So, look, there is scope for definitely the battery minerals and that. And incidentally in terms of rare earth, just as a bit of background, China produces I think about 80 to 85 per cent of them and Australia produces 15 per cent of them, basically, through Lynas Corporation. They have got a mine in Western Australia, and they are currently building a processing plant in the United States because the Americans are clearly trying to get away from China.

But one thing that electric vehicles offer, which is really interesting, is that you do not need the same amount of capex to build a plant as you would to build a traditional vehicle. You know, you can just source your battery, you just do the panels and you are up. There is actually a company in Victoria that is building electrified trucks. I cannot remember their name—it was at a conference a while ago—but there is definitely scope for local production.

And in terms of rare earths, yes, we have deposits et cetera, but rare earths are critical in so many other sectors as well, not just EVs. Does that help, Clifford?

Mr HAYES: Yes, it certainly does help. Thanks, Peter. Now, the other question is—you have warned about Victoria going it alone on renewable energy. What do you mean? Can you clarify that as to what you are warning us about, in what ways Victoria is doing this?

Mr SKINNER: Victoria has undertaken two very large Victorian renewable energy auctions, which commit the Victorian taxpayer to effectively the market exposure to very large amounts of generation. Now, one has to think about what the counterfactual is if that was not in place. There is already a great deal of renewable energy being invested in by the market generally just because the prices of renewable energy have fallen and the challenges of continuing to invest in fossil fuel are substantial. So that was happening anyway, and the market would produce that. Now, it may not produce quite as much in Victoria, Clifford, because let us be honest, Victoria is not the sunniest part of Australia, okay? And so the only way we get solar farms here is, you know, basically as a misallocation of resources. Really, they should be being built in Queensland and the output wheeled down here.

Now, Victoria is quite good in terms of wind, although it is still not as strong as South Australia or Tasmania. Now, there is certainly a role, for example, in wind generation. There were wind generators being built before the first renewable energy auction and there are transport costs as well, so even if we may not have quite as good a wind resource as South Australia we would still expect a substantial amount of wind to be built here, and it would have been built here with the investors taking full market risk without the state having to take the exposure. Those particularly stand out.

Obviously there was an announcement made two weeks ago in relation to offshore wind. Now, AEMO produces their long-term planning outlook, where they take on board what they know about costs—and I can assure you they know as much about the costs of building these things as anybody—and they had not anticipated that there was any market requirement to build offshore in Australia. And that makes a bit of sense, because it roughly costs about twice as much per megawatt hour produced as producing onshore wind, and you do it in places like northern Europe where there are real difficulties in terms of land availability, but you do not do it when there is plenty of land around. That is why AEMO have never recommended any, and that is why you would probably not see major involvement of offshore wind in a genuine market arrangement. And that is actually sensible. It is basically saying, 'We're going to allocate scarce resources'—which is your capital, or perhaps your cost when you pay your electricity bill—'on the most efficient sources of renewable energy'.

Mr HAYES: Thanks, Ben.

The CHAIR: I might quickly go to Mr Grimley. Sorry, I know you have to go shortly, so I apologise for that, but over to you.

Mr GRIMLEY: Thanks, Chair. Thanks for the opportunity, and thank you for your submissions today, Ben and Peter, but I will defer my questions to some other members, thanks, Chair, and I will shoot off. Thank you.

The CHAIR: No problem. I do not have any questions. We have got about another 15 minutes, so I am happy to go around again. Dr Ratnam, why don't we start with you? Do you have any other questions?

Dr RATNAM: Sure. This is more of a broader question I guess, taking up your point about acknowledging the transition, acknowledging what we often anticipate are practical constraints. I acknowledge the lived reality of that—there are some actual complexities in the transition that we have to problem-solve—but from my perspective and from the climate scientists' perspective there is an urgency to problem-solve those, because the counter to not doing that is really catastrophic for the environment and for the climate. So I guess I have a broader question: while heeding the practical realities and needing to do some of this complex problem-solving, how do you all reconcile that, particularly as you were talking, Ben, about potentially prolonging the time line, so you are saying rather than 2030 it should be 2035 targets for emissions reductions? How do you reconcile the urgent need for climate action? We have just had the latest IPCC report saying that we have got to end our fossil fuel dependence by 2030 at the latest if we are going to have a chance of avoiding the most catastrophic impacts of climate change. So in terms of your policy position, how do you reconcile that increasing urgency to accelerate our climate action with what you are proposing, which is slowing down some of that transition in some regard?

Mr SKINNER: No, I do not think that is a reasonable characterisation of what we are suggesting here. We are focusing actually on the net zero journey, and we are noticing that even since we nominated, we recommended, net zero by 2050 a couple of years ago we are actually falling behind on that journey. We want to at least get to that trajectory before we have to think about ones that are even more ambitious than that, so what we have proposed is that our best chance of getting to net zero by 2050 is to spread, if you like, the effort in terms of the decarbonisation on as many industries that have the technology reasonably achievable right now. I will be the first to admit that our industry does have quite a bit of capability to do that, and we are doing it. But we are taking it right to the extreme of what is possible at a reasonable sort of cost and reasonable risk. So the next thing you have to do as you get more ambitious in these things is to look to those other two sectors, and that is why we need to go there. Giving ourselves a little bit extra, if you like, years in terms of an interim target means that at least you can think about those two sectors and you are not purely thinking about, if you like, coming back to the old favourite of electricity, which is really at its extremes in terms of its transition rate.

Mr BROOK: Samantha, I can add a sort of personal reflection on that in that I joined the AEC in May last year. I have got an energy background, but since I have been there, at the wholesale policy, 90 per cent of the

stuff we are dealing with is about system strength, inertia and trying to incorporate more variable renewable energy. The whole market has gone away from megawatt hours to just focusing on how we can have a system that runs on very, very high levels of renewables. For example, on some days South Australia is running on rooftop PV, but then the sun goes down and they take our coal. Look, coming from an energy background into this organisation, everything is focused and everything is moving as fast as possible to do, with the transition investment, more renewables, also grid forming batteries—all this sort of stuff. A lot of OEMs around the world are looking at Australia as a test bed for these technologies.

In terms of climate change, it is a little bit like the story about Vietnam where the commander ordered a strike on the Viet Cong in front of him, then he rang back the artillery commander and said, 'Sorry, I got the coordinates wrong. You'll be firing on us', and the other guy said, 'Sorry, the shells are on the way'. It is sort of like we are already in a climate change catastrophe as it is happening, and Australia plays a small part in terms of our electricity generation. But the coal we export, clearly that is different. I am very impressed with how the energy sector is moving. It has always been one of the most aware sectors of CO_2 emissions.

Mr SKINNER: Samantha, just in terms of your objective, we can all regret that people had not taken earlier actions et cetera. But we are now on that journey, doing what we can, and one of the things I really do need to warn you is that thing can kind of blow up in a bad way. You just have to think back to the gilets jaunes type protests that you can get, the sort of reaction that you can get, if you take too big a step beyond the community acceptance. If being overambitious in one particular sector results in immediate and observable harm on the community, the enthusiasm to take the steps that you are taking is quickly lost and you can actually end up behind where you started. So this is why it needs real thought and management to carry through.

The CHAIR: I will just check with other committee members if there are any more questions. Mr Hayes, is there anything further from you?

Mr HAYES: Yes, I just thought of another one, Chair, if I could. I just want to ask you guys, and I do not know if you are very in favour of this. We talk about generating renewables in a certain area and transporting it somewhere else. Do you see a future for microgrids and keeping the supply in the areas where it is being consumed or trying to do that as much as possible?

Mr SKINNER: Yes, absolutely, Clifford. One of the things that we do get a little bit too carried away with when we look at the industry quickly is we assume that the solution to everything is building very remote generators and lots of transmission. Firstly, I have to say that has a role, but it is not everything. There are many, many options that can be done by simply having the resource closer to where the consumption is occurring, and that can be really close. It can be like PV on your roof combined with a battery that is actually within the customer. With those sorts of investments you can really avoid having to do the very large-scale investments that you might do elsewhere. Now, this is not to say that you should not be doing those. You should be looking at both of them.

What I am pleased to say is that a national institution like AEMO when they do their integrated system plan actually think about these things. They think about whether or not we can actually generate much closer to the load and therefore avoid having to build a lot of things, and they end up basically recommending both. They recommend building quite a lot of transmission, something like $12 billion of national transmission, and some of it will definitely create planning issues and so forth, but they also heavily recommend a lot of what we call distributed energy resources, which are the sorts of things you are getting at. Microgrids are all related to that area. Even though it seems like a lot of transmission that I have just described, that is actually quite small compared to the amount of investment that they are talking about in terms of new generation or even small DER. In fact when they dramatically accelerated their forecast rate of transition between the 2020 ISP—integrated system plan—and the 2022 integrated system plan, which anticipated a much quicker decline of fossil fuels, they effectively did not really recommend any additional transmission. Instead they are recommending much more local reliance and generation locally.

I want to emphasise that that is also one of the issues that we see in terms of the Victorian renewable energy options, the ones that are being promoted by government. It does tend to dull some of the market signals regarding locational signals because it tends to be cheaper to, if you like, build your generator way out in the remote parts of the state where you may have less densely populated situations, so you run into less planning issues, but then what happens is that you have to build a very expensive, very long and slow-to-build

transmission lines that instead face a whole range of issues of its own. So all you are doing is just shifting from one person's problem to another, and in this case the grid developer's rather than the generation developer's issue.

Mr HAYES: Thanks, Ben.

Mr BROOK: And look, Clifford, in terms of those sorts of investments a lot of PV is being curtailed by networks in that they will not accept it. My understanding is that there are housing developments being built or industrial set-ups where everyone has got PV, there is a battery. The fact that you have got more people doing it means someone does not need it, someone needs it, and they just have one connection to the grid. So there is huge scope for that.

Mr HAYES: Thanks, Peter.

The CHAIR: Mrs McArthur.

Mrs McARTHUR: Thank you very much. Look, I am pleased you have just touched on this issue of transmission because it is actually critical. We have got 30 huge transmission projects in the offing, and I doubt there is any totally isolated area in Victoria where you think you can actually produce energy, and then, as you say, it is very costly to transmit it long distances. There are massive social, environmental and agricultural impacts in this whole area of transmission. That clearly is not being taken into account in this whole argument that we must get to zero emissions by any particular date—or even 50 per cent emission reduction by any particular date. So how are you going to help address the issue of the impacts on communities, on agriculture, on the environment and the actual proper cost-benefit analysis of massive—particularly at the moment only AEMO are looking at basically overhead transmission when undergrounding clearly has to become an option if you are going to transition to renewables by any particular date?

Mr SKINNER: Well, at the AEC we are very strong supporters of cost-benefit analysis with any monopoly infrastructure, such as networks. Again I would speak some praise for AEMO's work. Previously they had probably underestimated some of the challenges of building long-distance transmission. We know for a fact that a few years ago they were dramatically underestimating the costs, and they were also underestimating the project build times—not taking appropriate account of all of the planning issues that almost always occur when you are involved in developing a new easement. Now, I would like to say that they have improved considerably since that period. In fact that is one of the reasons why they did not recommend a much greater development or deeper transmission in the most recent ISP compared to the last one, because they have realised that in fact, from a cost-benefit analysis point of view, transmission has quite a lot of burdens. So I would suggest that the issues that you are referring to have been effectively described economically—it is a difficult thing to do, but you have to do it—and have been introduced into those tests by groups like AEMO. Now, I do get concerned, if state governments do promote a particular renewable objective, that by not incorporating that sort of careful cost-benefit economics work they do not actually take all of those downsides into account.

On your question on undergrounding, look, whilst again it is a network issue, and there are experts probably better placed in the network area, it does tend to be incredibly expensive as an alternative. If you were, for example, required to build underground transmission and then you relooked at the overall power system, you would quickly come to the view that you would always build your generation very, very close to load centres. There would be almost no role for any transmission if you went on that path, if you were unable to take advantage of overhead transmission.

Mrs McARTHUR: But would you agree the work that has been done so far has never taken into account the triple bottom line costs over a 100-year period, for instance, of overhead versus underground transmission—let alone the amenity, environmental and agricultural downsides of the alternatives, where possible—that can be produced? We have got these new projects that are coming online in renewable energy that are clearly only embracing undergrounding the transmission from the production site to the grid. So while you say it is more expensive, and that is of course the argument of AusNet or anybody else, there has been no proper costing done of what the cost is as it affects individuals, communities, businesses et cetera. You only have to look at what is happening in the Western Victoria Transmission Network Project to see the costs to everybody else are enormous.

The CHAIR: Is there a question there, Mrs McArthur? Because that was a statement. Is there a question there for the witnesses?

Mrs McARTHUR: Yes. Well, do you agree there has been no proper triple bottom line analysis over a long period of time?

Mr SKINNER: What I do know is that when a group like AEMO tries to assess the cost of an overhead transmission line, they take into account the known costs that they are aware of. So, for example, there are compensations required for the acquisition of easements, and those known costs are definitely taken into account, and also the costs associated with the community consultation et cetera that is required for gaining approvals. Those sorts of costs are taken into account. Now, they may be of the more tangible nature and not perhaps the ones you are contemplating. I would not pretend to be an expert indeed as to whether or not those things are adequately accounted for.

The CHAIR: All right. Well, we are out of time, so I would like to thank you both, Ben and Peter, very much for your attendance today. Thank you for your submissions and thank you for your evidence.

Witnesses withdrew.