

TRANSCRIPT

LEGISLATIVE COUNCIL ENVIRONMENT AND PLANNING COMMITTEE

Inquiry into Climate Resilience

Traralgon – Tuesday 3 September 2024

MEMBERS

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WITNESSES

Dr Rakibuzzaman Shah, Associate Professor, and

Dr Jessica Reeves, Associate Professor, Federation University.

The CHAIR: Welcome back to the Legislative Council Environment and Planning Committee's public hearings for our Inquiry into Climate Resilience in Victoria. Welcome to representatives from Federation University.

All evidence we take today is protected by parliamentary privilege as provided by the *Constitution Act 1975* and provisions of the Legislative Council 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 the 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 the Parliament.

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

My name is Ryan Batchelor. I am the Chair of this committee and a Member for the Southern Metropolitan Region in the Legislative Council of Victoria. I will ask our committee members to introduce themselves.

Rikkie-Lee TYRRELL: Hello. I am Rikkie-Lee Tyrrell, Member for Northern Victoria Region.

Wendy LOVELL: I am Wendy Lovell, Liberal Member for Northern Victoria Region.

Melina BATH: Melina Bath, Eastern Victoria Region. Welcome.

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

John BERGER: John Berger, Member for Southern Metro.

Sarah MANSFIELD: Sarah Mansfield, Member for Western Victoria.

Jacinta ERMACORA: Jacinta Ermacora, Member for Western Victoria Region.

The CHAIR: I might ask you firstly to introduce yourselves – your full name and who you are appearing on behalf of and your title – for the Hansard record, and then I might invite you to make an opening statement.

Jessica REEVES: Thank you. Associate Professor Jessica Reeves from Federation University, based here in Churchill.

Rakibuzzaman SHAH: Rakibuzzaman Shah, Associate Professor from Federation University, based at the Mount Helen campus.

The CHAIR: Thanks very much. I might ask if you want to make a short opening statement of around 5 minutes or so, then the committee will ask you some questions.

Jessica REEVES: Thank you. Thank you for inviting us to speak with you today. As a regional university with campuses spanning the state of Victoria – from Horsham in the west to Gippsland here in the east – Federation University is embedded in the regional communities which we serve with the core mission of transforming lives and enhancing communities. The ever present threat of climate change, as we have experienced in the last few days, factors into the wide range of our activities spanning research, training, education as well as the lived experience of our students, our staff, our partners and our communities. It is part of our core business.

As a regional university we are also the trusted conduit of knowledge in our communities. They look to us for support, advice and also to buffer against the influxes of interest from capital cities and other parties, particularly in events such as the aftermath of the Black Summer fires here in Gippsland in 2019–20. In turn we take this as our responsibility to address the challenges that are most relevant to our regions. All of these factors

make our university very well placed to speak on the issues of climate resilience and how they apply to our communities in regional areas, so we are really grateful for the opportunity to speak with you today, so thank you.

For the last seven years my research has focused specifically on Gippsland in the areas of waterway management, climate adaptation and environmental stewardship as well as community agency in the myriad of transitions that are currently occurring in our region. One of the key findings of my research is that Gippsland is certainly synonymous with natural disasters in recent years, from droughts to bushfires to floods, coastal erosion and extreme storm events, in many cases impacting the same places and communities. Historically these have been treated as isolated events with independent responses and targeted relief packages, but the cumulative impacts on communities, infrastructure and environment are poorly considered. My research takes a very place-based and community-based approach to adaptation transition and considers local knowledge and deep time, and all of these projects that I have worked on have picked up this cumulative effect of these different incidents occurring to the same places and the same people.

In particular our local farming communities, who are highly literate on issues of climate variability and how this impacts their enterprises, are looking for more integrated ways of building resilience into their farming systems, which is evident in our Growing Southern Gippsland project. There is opportunity to provide regional or community-based support to assist with challenges of supply chains and variability challenges with farming communities using a more collective and integrated approach, supportive of circular economy principles and really looking at the capacity that our land has and the capability that it can provide. We are starting to see this through some of the drought resilience projects that are starting to come together.

With the University of Melbourne we had the opportunity to interview communities in East Gippsland who were engaged in acts of nature following the Black Summer fires. We found in times of crisis we go to our trusted sources of knowledge and communication with our communities, and they are critical to work with these people as they are getting through the disaster and the rebuilding. When we are looking for places where support should be addressed, it needs to provide support to scaffold the human infrastructure as well as the built infrastructure in these times, not overburden or undermine the structures that already exist. This can be built through community building awareness and supporting co-design of community emergency planning and climate resilience, autonomy of essential services in a modular effect should the supplies be cut off or working directly with existing support structures rather than creating new ones in response and recovery.

Community inventories can be developed to gain a quick understanding of who has the skills, knowledge, tools, resources and networks in an emergency, and this certainly played out in my home town of Mirboo North earlier this year. The key here is the cumulative impact of multiple events. For example, the algal blooms that follow the floods, that follow the fires, that follow the drought are not isolated events and have a larger impact than the one that makes news headlines and captures public imagination. Recovery has a very long tail and is more frequently being interrupted by subsequent compounding events, so new infrastructure should also be mindful of trauma from past events and not cause further triggers – for example, clearing trees in preparation for widening roads. Context of place and people is essential for successful climate resilience.

Thank you. I would like to now introduce my colleague, Associate Professor Rakib.

Rakibuzzaman SHAH: Thanks, Jess; and good morning, honourable members. As I mentioned, my name is Rakib Shah, Associate Professor from Federation University in smart power system engineering. I also lead the team on future grid and community energy, so my research lies within the community's benefit on energy resiliency in terms of extreme weather and beyond. In Australia we are experiencing a number of weather-related events and climate-related hazards on a regular basis, and in the recent past we have seen that there are multiple events that are happening. The future projection has increased the level of greenhouse gas emission, and research says that compound weather and climate events in Australia are very likely to increase. The energy sector is no doubt highly vulnerable to the climate change impact, particularly through changes in frequency and intensity of extreme weather and climate patterns.

A number of extreme weather and climate events have unfolded in the recent past, including the Black Summer bushfires, as Jess mentioned a few minutes ago. In addition, the energy sector has a seminal role to play in reducing the current and future carbon footprint, which is necessary to limit an increase in risk resulting from climate, given the increased coverage of the electricity network across Australia. In the case of the 2019 and

2020 Australian bushfires the electricity grid was disrupted for many regional communities, as we saw a few days ago as well. Communities need to be able to cope with this type of short-term outage caused by bushfire and other natural disasters. There are three challenges that have been evident from our research that we have conducted. The first is that, whatever the measures we have taken, it may take longer to make our energy system fully resilient, so we need to find out other power restoration methods with community engagement to design and meet this demand.

We hope that this overview has provided our particular expertise in projects related to climate resilience. In addition to today's session, Federation University Australia will always welcome any requests for information and offers of collaboration which contribute to supporting the resilience of the communities which we serve against events and impacts related to climate resilience. Thank you.

The CHAIR: Thanks very much. I might begin the questions. Associate Professor Shah, obviously we have seen repeatedly the impacts that different disaster events are having on particular energy transmission distribution infrastructure. How possible is it to make that sort of infrastructure resilient to the types of disasters that we are confronting on an increasing basis?

Rakibuzzaman SHAH: What we have seen from our research is that it is possible. It is not impossible, but it is possible. What we have done so far is we have looked into bushfire, because it has quite a widespread impact on our community, and we have made our network almost bushfire resilient. There are a number of works that have been guided by the federal government and state government and by different distribution network service providers to make the network resilient against a bushfire. But the issue that is happening right now is we are seeing a bushfire, after that a flood, after that a cyclone, after that – it is the repetitive effect. So to make a network or infrastructure resilient against that N number of events, we need further investigation, research, government involvement and different stakeholder involvement – to make them resilient against all these different events that we are facing.

The CHAIR: You said that you think we have done a lot with respect to bushfires. What sorts of events do you think we have done the least on, or where do you think the most additional research or further work is required? What types of events do you think we know the least about?

Rakibuzzaman SHAH: Could you please make it a little bit more clear? I lost the first part of the question.

The CHAIR: Sure. Your evidence is that we have done a lot with respect to the risk from bushfires. What other types of disaster events do you think we know less about, where we need to do more research, more investigation, particularly with respect to energy transmission lines and their resilience?

Rakibuzzaman SHAH: One of the main things that we can see, because of the events of El Niño and La Niña, is that there is an east coast low that is a specific type of weather pattern that we can see in this part. Because of that one, there are repetitive cyclones and low-pressure, high-pressure things that are happening. Right now we are aware of those things, but how we can predict them and then make our network resilient against them is one of the areas that we need to focus on. A couple of years ago the Australian Power Institute looked into this one. It moves a little bit far with the transmission system but not with the distribution and the local community, where the distribution and the local community need to be taken care of, and especially the community energy system needs to be taken care of against this type of event. So, an early warning system, and with an early warning system we also need to know how we will disperse this different type of backup energy system, especially for the crew, the repair and the restoration. That is the area I think we also need to investigate a little bit more.

The CHAIR: With respect to the local energy system – so not the transmission but the local distribution – you mentioned a bit about the restoration and the crews. From a resilience perspective what do you think our biggest vulnerabilities are in that particular part of the system, and what could we do to strengthen the system against those vulnerabilities?

Rakibuzzaman SHAH: The biggest part of our community is the isolation, how they are isolated. The second part is the lower number of population and, in some of the communities where we have worked, really the age of the population – we see that the aged population is increasing there, so definitely they are vulnerable to health issues and all those different things that come after the effect of the extreme weather. Those vulnerable communities, many of them are connected by a single line because of the nature and the trend that we have. In

those communities what we have to find are the small islands within the community which can be served as the critical load. For example, what we have done in some communities is we have found out that there are a number of patches within that small community where we can make the power to be almost 100 per cent available even during the extreme event. There can be a backup from a battery and there can be a backup from other generators, small generators, so that those places can be 100 per cent at a level to those REZ communities so that when there is an event happening they know that within their community there are five places where they can go and they can have their shelter and they can meet their requirements in terms of their health and in terms of the communications and other things.

The CHAIR: Thanks very much. Ms Bath.

Melina BATH: Hello. Thank you, Chair. Thank you very much for appearing. I have so many questions and 5 minutes in which to ask them, so clearly we will not get them all in. Associate Professor or Dr Reeves? Is that fine?

Jessica REEVES: 'Jess' is fine.

Melina BATH: Jess is fine. There we go. I love casual. I felt like you said in your introduction that you feel that farmers are climate change illiterate.

Jessica REEVES: The opposite.

Melina BATH: Right. Thank you. I was concerned about that because I really feel that farmers are very much in touch with their land and understanding. In Victoria now at the moment, with the government's decision to fast-track renewables, the government has removed the rights of landholders, of farmers, if there are going to be renewable developments coming in around their properties, to actually protest and take these exclusions to VCAT or to take their concerns to VCAT. I wonder – do you feel that that impinges on farmers' rights to be able to look after their land, or are you comfortable with that – that they are removing those rights of appeal through the VCAT process?

Jessica REEVES: Sure. I believe that everybody has the right to engage in discourse. One would hope that you could have a conversation before it would need to go to appeal, so it is taking the time to work with the landholders to understand what changes are coming and to understand what their concerns are and their non-negotiables too so that it would not have to go to a point of appeal. So it is taking the knowledge of their land and taking the concerns that they have as being valuable pieces of information that would probably end up with a better resolution of the problem in the first place.

Melina BATH: Where that agreement cannot be reached, do you feel that it is appropriate that the system stands as it is now, where they have removed those rights?

Jessica REEVES: I think everyone should have the opportunity to voice their concerns.

Melina BATH: Thank you very much. You speak about waterway management. We have a lot of water in Gippsland particularly and some of that can have impacts on our current mines in the Latrobe Valley, and you being in Mirboo North will understand that. In 2022 we saw farmers land flooded as a result of downfall and that management, so can you speak to how there needs to be finesse around managing that? Certainly we need to protect Yallourn North until 2028 and then further on for Loy Yang, but how do we need to manage those waterways, protecting the structure of the mines but also the farming land around? Can you speak to that?

Jessica REEVES: Sure. We saw that a little bit with the spillway going into Hazelwood being able to take some of the floodwaters there in order to protect the asset of Yallourn as well, so I think it is really taking an integrated approach to how water is managed right throughout the catchment from the upper headwaters right down to the Gippsland Lakes and everything in between. I think the concepts of that are well explained through the sustainable water strategies and the aspirations of the sustainable water strategies looking at the whole of the water supply, both for natural flow and for consumptive uses of water as well. Where I think there are challenges, for example, is with the mine rehabilitation plans, the declared rehabilitation plans that the three operators are expected to submit by next year, and how they are done as separate pieces or applications rather than looking at the cumulative impact of all of those uses of water and the impact on the catchment more

broadly. Having as integrated an approach to water as possible, both for the protection of assets and downstream uses or downstream receptors as well, is critical.

Melina BATH: Sure. And if you look at the Latrobe River Irrigators, the ability for us to grow more food more intensely, I guess, in a positive sense but also those environmental flows to balance that out and put water into the lakes – that has to be managed.

Flowing on, Professor, in relation to power outages, Mirboo North was struck really horrendously for 6½ days and did not qualify for that funding. Most people were in that space. How can we – and you mentioned it a little bit before – meet the needs of those interruptions in the electricity supply? Can you just speak a little bit further to that? What are some of the key factors?

Rakibuzzaman SHAH: Through our research what we have found is that there are five pillars that can be investigated a little bit more to make those things. First is criticality or the reliability of the supply. Second is how we can look into the sustainability of things, and also there is critical load or the minimum requirement for any household. If you want to make this energy system resilient against those, first you have to find out how you will be able to manage the base requirement or the minimum requirement that a person needs for six days or a family may need for six days. You can have a big battery, but that big battery may not go through all six days if you try to use it as we are supposed to use them when there is power. So we need through community engagement an assurance that, yes, you have the backup system but when there is a flood or things happen then you have to reduce it and you have to have this other critical infrastructure that you should run. So you have to cut back some of your requirement, and that will make this battery last longer so that they can get the supply that meets their requirement. But it is important at the same time that we cannot make a system for 10, 12 days of resilience. Yes, we can make it, but it requires money, so we have to come up with a solution where the resilience can be there for six days if you use it in this pattern. But if you do not use it that way, probably the next morning your battery will be flat and there will be no power. Community education on that and definitely designing the system with more community involvement should be there. So it has to come from both sides – from the DNSP or service provider point of view and also from the community point of view – and when they both meet together then we will have a system where the community can understand what they can do in that situation and the DNSP will have the idea that we have the system in place and if this can run for six days they can disperse the crew for the restoration. And the restoration is definitely important.

Melina BATH: Thank you.

The CHAIR: Thank you very much. Dr Mansfield.

Sarah MANSFIELD: Thank you. Thank you for appearing today. Associate Professor Reeves, I am interested in whether you have any examples from your work of where communities have been empowered to increase the climate resilience of their own built or natural landscapes and if you can talk about what that looks like.

Jessica REEVES: Thank you for the question. ‘Communities’ is a very broad term, and there are many of them that we have across here. I would say that a lot of our farming communities are already doing this in shifting the ways that they are farming to more regenerative measures and doing this not necessarily for climate action but because it is a sensible way to farm. They are going to get greater productivity and longer term endurance out of their farms and have a collective approach to that. We are seeing it in smaller communities – for example, groups like TRPI on Phillip Island. So groups of people are getting together. The Cosy Homes project is a fabulous example of that, where they are retrofitting homes for low-income people to be more climate resilient – going back to Rakib’s comments about the most vulnerable in our community being the most directly impacted and having a community approach to that. There are other examples of revegetation, particularly after the Black Summer fires, to be more fire resistant as well and considering what sort of plans to replant. Certainly that is happening throughout East Gippsland. I think there are many examples, and I would say all communities are thinking about this as they are doing their various rebuilds.

Sarah MANSFIELD: Okay. Are there things that you think we could do to provide more support to enable that to occur more broadly?

Jessica REEVES: I think one of the greatest challenges, particularly if you are coming on the back of an event, is the competitive grant scheme is horrible for a community who has just been through a really traumatic

event. So working with communities as to how they want to rebuild and design with them rather than asking them to compete against each other about who can fill in the form best would be very wise.

Sharing conversations between communities is fairly important too. A lot of these communities can feel very, very isolated in their experience. We felt that in Mirboo North when we heard from other communities about what they had been through. That shared experience and what it looks like on the other side too is very important, so trying to build those connections between communities is important.

Sarah MANSFIELD: Thank you. Associate Professor Shah, do we currently have sufficient data to understand what the energy needs are of vulnerable communities and I guess what infrastructure is currently in place and what is required? Do we have that data?

Rakibuzzaman SHAH: Thank you. We may not have the proper data base for that one, but through a number of the projects that have recently been conducted in this part of Victoria and other parts there are data that have been already generated. Those have been generated through a number of state government agencies in collaboration with the researcher. We know that there are a couple of vulnerable communities – one of the examples that we can give is from Venus Bay. Another example we can give is from Heyfield. These are the communities where the government and the researcher altogether and the community have done a lot of work, and data has been generated through this project about what is the requirement for them.

One of the good examples that is happening right now is some of these communities are going through the neighbourhood battery scheme that is coming, and that is empowering them – not the entire community, only a portion of the community, as I mentioned, where there is criticality in the community where that is happening, especially in Heyfield. Also, from the west of Victoria I can give an example of Donald and Tarnagulla, where we have an understanding of what is the community's requirement. Again, in Horsham, Mildura and some other regions I am right now involved with one of the projects with DEECA where we are also generating the data for what the requirement is for the energy from the communities and what is the vulnerability there.

Sarah MANSFIELD: Okay. I guess we have got information from parts of the state and we are starting to build up a bit of a picture of what those needs are.

Rakibuzzaman SHAH: Yes.

Sarah MANSFIELD: Okay. You mentioned a number of measures that can be put in place to improve the energy resilience of those communities. Do we have a sense of the scale of that type of intervention that needs to be rolled out?

Rakibuzzaman SHAH: At this moment our research is in the early stages of that one – how much intervention is required and what is the skill. Based on what the evidence is from the research, we need a significant scale of intervention. But at this moment I cannot tell the level or any numbers on that one.

The CHAIR: Thanks, Dr Mansfield. Mr Berger.

John BERGER: Thank you, Chair. Thank you, both, for your appearance this morning. Jessica, you mentioned in your opening about the challenges in the supply chain. I am just wondering if you could point us to some of the challenges and what you might see as some of the ways that you might deal with those challenges or solutions to them?

Jessica REEVES: As you are probably aware, Gippsland has a spine, which is the freeway, and anything that interrupts that interrupts everything, particularly for industries like dairy where being able to get your milk to dairy is critical. I think things that could be done would be becoming less dependent on major carriers, and we have seen an example with the Prom Coast Food Collective, a group of independent farmers who got together to organise their own distribution network. It is small scale but meant that they had access to markets that they would not have otherwise, so rather than being highly reliant on the one major corridor and the one major provider to get goods and services to and fro, doing that in a more integrated way that was more modular and community based. The freeway is great when it works, but if there are interruptions, it really shuts down a very large part of the state.

John BERGER: Thank you.

The CHAIR: That is it? Thanks. Ms Broad.

Gaëlle BROAD: Thank you very much. You mentioned human as well as built infrastructure. Earlier we heard from local councils and they talked about communities that are better prepared recover quicker. What are you seeing in those communities, and can you talk a bit more to that human infrastructure that you were referring to?

Jessica REEVES: Sure. The experience that I had in talking with people in East Gippsland was that there was an enormous role one of the Landcare groups took on. They became the trusted conduit and the trusted people for a whole range of different networks and underwent their own trauma themselves. It is understanding who are the key people in those communities and how do you scaffold and support them to be the trusted source of information without adding extra burden to them. In the Mirboo North community it was the RSL. They just set up in the front and posted notes on the wall. It is who those people are that step up.

I think there is an inventory that could be done on most communities to understand what those networks are. They may be church groups. They may be sports clubs. Who are those trusted people? Literally when the proverbial hits the fan, who are you going to trust for that source of information? The government was good in being able to come into areas and provide other assistance, but unless they are working in with those established networks, there is going to be conflict, particularly when you have got a traumatised community. So scaffolding, supporting and working in those networks I think is far more successful.

Gaëlle BROAD: In the previous submissions the councils were talking about emergency management and disaster resilience that has 97 per cent of funding focused on response and recovery and about 3 per cent based on mitigation and preparedness. They want to see a shift in that. Can you speak to that? Do you support that move? What would that look like?

Jessica REEVES: One hundred per cent. The respond and clean-up and respond and clean-up is a real waste of resources. If we can build the resilience in at the front end, what does that look like? I think it does require again community conversations about what that might look like, about where the priority areas are, like Rakib was talking about, to have a centralised area that you go to that is completely off grid and well resourced regardless of what the situations are but where all of the community knows where that is and how to get to it. It might be areas that you choose not to rebuild but have that community conversation about 'We do need to restrict growth in certain areas; how do we all understand that as a community and be part of that in our planning going forward?' rather than having to deal with it at the time of crisis and in the clean-up afterwards.

Gaëlle BROAD: With some of these works – we heard about door seals and upgrading local infrastructure – but you are a region that has had all sorts of storms, floods, fires. There is a huge range, isn't there, in terms of the upgrades to particular assets. Are there any kinds of key things that stand out that you think would help communities become more resilient? In terms of priorities, we heard from local councils too about instead of drainage they want to spend money potentially on a library or a childcare centre. There is a limited pool of funding in a way. How do you prioritise, and what are those key things that you think need to be addressed first?

Jessica REEVES: I think there is sort of a hierarchy of needs and unfortunately the things to cut ribbons against are not necessarily the most beautiful things. Stormwater infrastructure is not as beautiful as a new hall, and both have value within a community. Sometimes the less glamorous things can be the most effective. But I think simple things as well, like I mentioned the Cosy Homes project before – just that basic assessment of houses and what is the basic housing stock and how do we improve it? That is where most people live. We are hoping that those houses stay and we do not lose them all or have to rebuild them all. Obviously you build back better if you have to, but how do we retrofit what is there? And how do we support individual households to achieve that as well? It does not necessarily need to be large scale and expensive. It gives the community members some autonomy as well and some agency in doing that, rather than waiting for the big thing to change.

Gaëlle BROAD: I think with the housing statement there was comment that perhaps there was not the focus on those futureproofing aspects. Would you agree that more attention needs to be given to new developments?

Jessica REEVES: Absolutely, yes. We need to be planning for an even more variable – the only thing we can plan for is more extremes at both ends the spectrum and to consider that at any new build and in any expansion.

Gaelle BROAD: You also mentioned waterways, you focused on that. I know speaking to – because I am from the northern Victoria area – some of the creeks that do come into play with disasters, there could be permits required from up to seven different authorities. Do you feel that there could be a bit of clarification around who leads works surrounding creeks? Do you have any insight into that?

Jessica REEVES: I would say who uses but also who looks after, like who has responsibility for. I mean, our catchment management authorities are wonderful and they do fabulous things, but of course there are council layers to that as well and then there are the water supply companies. So the water field is very contentious and fraught. And I think again also from a community perspective – we have got a project starting in East Gippsland about the urban waterways there and the first question we are asking the community is, ‘Do you know who actually looks after these sites?’ because there is a real lack of literacy about who has the responsibility for all of these waterways. I think that could definitely be improved and give people agency too to participate in that – that they can look after their waterways as well.

The CHAIR: Thank you, Ms Broad. Mrs Tyrell.

Rikkie-Lee TYRRELL: Thank you, Chair. I will start with you, Jess, if that is okay. Earlier you said farmers are very literate in regard to the climate – thank goodness we cleared that one up; I am married to a farmer. As a state government what lessons should we be learning from our primary producers in regard to climate?

Jessica REEVES: When I worked on the Growing Southern Gippsland project we interviewed a whole lot of farmers around South Gippsland originally and then we reached across Gippsland. They all take records. They do not necessarily fill in spreadsheets, but they all have intimate records. An apple farmer who puts the date of when each of his 400 varieties of apple blossoms each year and has charted that over a 15-year period. That is a beautiful climate record. So it is really understanding what that lived experience of climate variability is in place and from that what the extremes are, what is different and then what the response is to that. So I think there is an awful lot of knowledge in farming communities and on farm about the natural variability and these extreme events as well but also what the responses are likely to be.

Rikkie-Lee TYRRELL: Wonderful. Thank you very much. Dr Shah, how do I pronounce it properly?

Rakibuzzaman SHAH: You can call me Rakib.

Rikkie-Lee TYRRELL: Rakib. Okay. Thank you very much. In regard to new and developing energy technologies, do you have your finger on the pulse on up-and-coming, potentially more efficient energies that we could be producing or technologies that could be producing energy than currently the wind and solar that is set to decimate our primary agricultural land in Victoria?

Rakibuzzaman SHAH: I will answer that one from two perspectives. One is from the technology and another is what the community actually wants. As I mentioned, we have a number of projects where our team has communicated with the community, and the community has a long list of wishes about the technology. All the things starting from the old, diesel-based small generator all the way sometimes to the wave and even other technologies – so it is whatever they can see and then feel is something that can be used. So right now what we can see with the efficiencies and the way that we go forward is that still solar is one of the predominant options – with battery storage, if that is possible. But we know that there are many places, many farming communities where there are houses, where there is no solar yet, so that needs to be taken care of. What is the scheme, the process, so that we can put solar there? Solar is still the model of choice – easy to install and easy to have there with the battery to get rid of some of these energy resiliency issues.

In this country we do not have any small wind. Definitely we have the large wind and the process for that as we move forward. In other places there is small wind that the community can use, but I think there is only one example here in Australia. Other than that we do not have any community-based wind. Other technologies are coming, especially with the hydro cell and the fuel cell – that is in terms of the technology. Many communities are interested. Why they are interested, as Jess mentioned, is they are farmers and they know how they produce

and also they know the waste that they generate. One of the key issues with these farming communities is the amount of waste they generate. What they do usually, we can see, is just burn some of that. Can we use that waste to convert into energy? Not only the hydro cell, but maybe there is some other possible way of generating it. In one of our projects that we have done in western Victoria with Gaia EnviroTech we have looked into that: can we use the dairy waste to convert it into energy? Then also the dairy farmers can become energy resilient and independent when there is no supply, because then they also suffer. So these are the technologies that, with evidence from our research, we believe can be useful for the community.

Rikkie-Lee TYRRELL: So that waste that you are talking about using, is that through a digester – if that is what they are called – where they burn all the waste and then harvest the energy through that?

Rakibuzzaman SHAH: There are a number of technologies right now. One way is through the digester; another way is we have worked with one of the industries here in Gippsland where we have looked into the technologies that have used the solid fuel itself. So the solid fuel goes into the burners and is heated up the same as for coal, but then from there we actually use it to generate the electricity through the conventional way of generating. So different technologies are already there. The good thing about this solid fuel one which I have mentioned is that it is Australian manufactured technology. That means that can bring the benefit to the community as well because it is manufactured here in Australia.

Rikkie-Lee TYRRELL: Just for all of those people concerned about the environment, are all the emissions from those still contained and reused constantly? They are recycled, aren't they? What are the emission outputs? There are none, are there?

Rakibuzzaman SHAH: For the solid one we still need to look into what the emissions will be, but it is definitely using the biomass from the community.

Rikkie-Lee TYRRELL: Minimal.

Rakibuzzaman SHAH: With the gasification one we already know that there are very little emissions from there. Still there are some unanswered questions for the solid fuel one because it is the new technology that we have seen in Australia, especially since it was developed here. So there are still unanswered questions. But for the other, waste to energy we already know is taken care of by the environmental effect and the GHG emissions.

Rikkie-Lee TYRRELL: Wonderful. Thank you very much.

The CHAIR: Bang on time. Ms Lovell.

Wendy LOVELL: Thank you very much. Thank you for your presentation. Mrs Broad already highlighted the need for investment in a whole lot of things in regional communities. The reality for those of us who live in regional communities is we are disadvantaged compared to metropolitan areas. In metropolitan areas there are a lot of people living in a small area. The amount of people means that there are more services and more funding available to provide those services. In regional communities the reality is that we are socially isolated. To deliver services into some of our smaller towns is very expensive for local government et cetera. It is also going to mean that for investment in climate resilience there is a much bigger amount that is needed and very few people in those areas to fund it. So when you do your research into climate resilience, how do you balance the need for infrastructure upgrades or new infrastructure with the economic realities that face regional communities to ensure that they are not even further socially disadvantaged?

Jessica REEVES: My quick answer would be, in looking at the Gippsland experience, we have six LGAs that are very different. They all have very different strengths. We were talking about biomass before, so even if we are looking at alternative fuel sources, there are different fuel stocks in different regions. So I would say definitely look at what is the solution that best suits that place, so being a bit more bespoke about it rather than having one solution that gets rolled out everywhere and then it gets competitive, so very place-based prioritisation.

Rakibuzzaman SHAH: When we do the work, the first thing that we look into is: can I use what is there? That is the first thing, so that I do not need to invest more. One of the examples that I can give from some of the activities that we did with the Gippsland area is what is the amount of solution, especially the energy they have,

and definitely government did a good job of putting in some of the recreation reserves and in many other places. Where there is very little use of some of the infrastructure, can we use that infrastructure to make the community more resilient? Is there any way to do that one? That is the first thing that we look into.

The other thing, as Jess mentioned, is that each community has a different thing. Like, if I took the solution of places where there is a lot of biomass – I give the example of two communities in two parts of Victoria – that may not be suitable for some of the communities which are on the seashore side in Gippsland because they do not generate a lot of biomass. So we also need to look into is what their requirement and what infrastructure has been developed already.

There are many places where new future opportunities may arise. For example, there are places where tourists usually visit during the bushfire season, because that is the summertime when there are a lot of tourist visits. As we move towards green transportation systems, there will be a lot of electric vehicles with chargers that will arrive in those communities. Can we use the traffic that is coming with charged batteries on their electric vehicles during the emergency period? Is it possible to do that? These are the questions that we ask ourselves when we do the solutions and find out what is the optimal – not new – investment, rather how we can optimise our current investment and the current situation that we have.

Wendy LOVELL: Yes, but with respect to that answer, you talk about investment in transportation into electric vehicles and stuff – we do not even have public transport in most of our regional communities now, yet more investment is going into the metropolitan areas so that they have cleaner, more efficient public transport and we are not even being considered for public transport. So in regional communities we are significantly disadvantaged.

What I hear from you is bespoke solutions for regional Victoria, but what we are seeing with the planning schemes that are being imposed on us by the state government, such as not being able to appeal to VCAT on renewables, is a blanket approach. So do you believe the state government position on planning is actually wrong? Some of the targets for housing are not necessarily being received well in regional Victoria. Are we in danger of overinvestment in climate adaptation measures at the expense of the real infrastructure needs in regional communities?

Rakibuzzaman SHAH: Jess, would you like to go first?

Jessica REEVES: I was going to avoid that one.

The CHAIR: Can we just get a brief answer?

Rakibuzzaman SHAH: At this moment I do not want to make any blanket comment on that one. I think it should be revisited. That is my quick answer on that one.

Jessica REEVES: And my response would be I definitely think that the specific needs of each community need to be heard.

The CHAIR: Thank you, Ms Lovell. Ms Ermacora.

Jacinta ERMACORA: Thank you, Chair. Thanks for attending, and apologies for being online. My first question is for Professor Reeves. Should those who rent expect to have the same sorts of energy-efficient and well-insulated homes as those of home owners?

Jessica REEVES: The short answer is yes. I think, as I mentioned before, the issues with housing stock are universal, and everyone has the right to have a comfortable home that they can afford to run. Where possible, if effort can be put in to lift that standard for the people who need it most, I think that would be a very sensible target of efforts.

Jacinta ERMACORA: Just along the same lines around that concept of climate change equality, we have got, for instance, the Pacific Islands, which are going to be more affected than, say, other parts of the globe. Locally in our communities, either by gender or Indigeneity or income base or place, are there any unique cohorts that are more vulnerable to climate change impacts than others?

Jessica REEVES: I believe GLAWAC are speaking next, so I will not speak for them. I will just note that specific things like coastal areas, where they are looking after their old people there through coastal erosion, are critically important. That is quite a unique feature. But I think our older people – as Rakib said, our most vulnerable people in our communities, who are least able to adapt and shift or be relocated: people want to be in place where possible. Enabling people to safely be in place where that is possible to do so is really important – older people, low socio-economic people. You mentioned renters before; I would agree with that, the security around rent. There are not a lot of rental properties in regional areas, so having that security as well is important. I would say people who are vulnerable generally are going to be most disadvantaged by climate variability and changes.

Jacinta ERMACORA: Is that because of their ability and the availability of resources to respond to a situation?

Jessica REEVES: Yes, security of housing, security to adapt their own environments. As you mentioned before, are the houses that they are living in fit for purpose or not? I would see that as being key. Rakib, do you want to add to that?

Jacinta ERMACORA: I am happy to hear from either of you, I meant to say.

Rakibuzzaman SHAH: Definitely there is work that is around right now on energy poverty. I think that has been widely circulated in some of the areas in Victoria. There is some work that is going on, especially with respect to that one, how the community can benefit and what are the issues that can be added there. In terms of renting and rented property, there are some communities that raised a concern about that one. There are communities where one-third of the population usually live during the whole year and then two-thirds of the population usually come and rent during that time. Those properties are usually not looked after during the other time of the year, especially in terms of looking into energy efficiency and how those properties' roofs can make an extra little bit off the solar. There can be community engagement that can happen with the owners to look into how those properties can be used even if those properties are not used throughout the year but they have a space where additional things can be put, or can those properties be used in some other ways so that they can be of benefit to the community.

Jacinta ERMACORA: Thank you.

The CHAIR: That is your time, Ms Ermacora, and that is the time for this session. Jessica and Rakib, thank you so much for coming and giving evidence today. You will receive a copy of the transcript of today's evidence in the coming week if you could you review that and provide any comments back to the secretariat. The committee will take a short break to reset for the next witness.

Witnesses withdrew.