ECONOMICS AND INDUSTRY STANDING COMMITTEE

INQUIRY INTO MICROGRIDS AND ASSOCIATED TECHNOLOGIES IN WA

TRANSCRIPT OF EVIDENCE
TAKEN AT PERTH
WEDNESDAY, 31 OCTOBER 2018

Members

Ms J.J. Shaw (Chair)
Mr S.K. L'Estrange (Deputy Chairman)
Mr Y. Mubarakai
Mr S.J. Price
Mr D.T. Redman

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Hearing commenced at 9.36 am.

Mr MARK DONALD PATERSON
General Manager, Consumer Energy, Horizon Power, examined:

Mr LAURIE CANDELORO CURRO
General Manager, Power Systems, Horizon Power, examined:

Mr TERRY MOHN
General Manager, Advanced Microgrid Development, Horizon Power, examined:

The CHAIR: On behalf of the committee, I would like to thank you for agreeing to appear today to provide evidence in relation to the committee's inquiry into microgrids and associated technologies in WA. My name is Jessica Shaw and I am the Chair of the Economics and Industry Standing Committee. I would like to introduce the other members of the committee. To my right is Yaz Mubarakai, member for Jandakot. To my left is Deputy Chair, Sean L'Estrange, member for Churchlands; Stephen Price, member for Forrestfield; and Terry Redman, member for Warren–Blackwood.

It is important that you understand that any deliberate misleading of this committee may be regarded as a contempt of Parliament. Your evidence is protected by parliamentary privilege. However, this privilege does not apply to anything you might say outside of today's proceedings. Before we begin with our questions, do have any questions about your attendance here today?

The WITNESSES: No.

The CHAIR: Would you like to make opening statements?

Mr Paterson: In Sami's absence, I will coordinate from our side in terms of how we apportion responses. Very briefly, we are very pleased to be present with you again today. Obviously, in the context of what I often recognise from my CSIRO background is the largest transformation of electricity since Edison and the real Tesla back in the late 1800s. I guess we are very pleased to see such a holistic approach to this topic simply because the electricity system is a technological system, but it is a very complex societal system as well in the sense that it touches in a modern economy technologies, physics, economics, social sciences and all of those things being interwoven as a delicate tapestry, if you like—pull on one thread and some other threads come apart.

A couple of other just quick comments, it is very interesting to see the level of global attention being focused on the Australian continent around this topic, and particularly the spotlight is very much focused on both South Australia and Western Australia for a range of reasons because they are very much the lightning-rod kind of environments where this is playing out.

Just finally, all this plays out at a societal level in terms of the shared system that we all depend on as citizens. The economics of it are facing a new level of challenge and particularly figure 3 in our submission highlights the declining future of asset utilisation, which is assets we all own and ultimately depend on. I think that is at the heart of the economic challenge of how we stabilise that for the benefit of all citizens.

The CHAIR: As you are aware, we have broken this inquiry down into two parts. In the first section, we heard from Horizon Power and focused very much on scoping out the opportunities associated from raw material inputs right the way through to system and assets optimisation perspectives. In the second phase of the inquiry, we are very keen to understand regulatory barriers or regulatory

enablers and market structures that are going to either encourage or inhibit the rollout or, I guess, the opportunity to maximise the benefits of these technologies so our questioning will be very much focused on those issues. Hopefully, that helps frame the discussion that we hope to have.

Your submission, from page 24 onwards, talks about regulatory considerations. I would like to explore some of the concepts that you have introduced in your paper in a little more detail and also later on, if we have time, at page 47 onwards, then have a bit of a chat about tariffs and incentives. Examining first regulatory considerations, you talk about heavily regulated and unregulated microgrids. You also draw attention to the fact—indeed, in your evidence to us previously—about the fact that Horizon Power operates in an unregulated context from at least an economic regulation perspective, and that you have been doing some regulatory trials. Could you talk us through the regulatory trial that you have been doing, where you have been doing it and how the approaches that you take differ from typical approaches to economic regulation? I guess, a turnover, and if you can give us an overview, we can go from there.

Mr Paterson: I do not know, Terry, if you wanted to—there are a number of elements to this particular area and we are particularly looking at it, I guess, not just purely from a regulatory point of view but from more an operating model point of view because we are taking a holistic approach—business models, technologies and the regulatory construct. I am not sure Terry if you want to —

Mr Mohn: Sure, I can talk a little bit about some of the technology investments we are making to investigate new regulatory regimes. Maybe I will leave Laurie to talk about MyPower if that is the intent.

One of the things that we are doing is investigating the notion that distributed resources are becoming more prevalent. Many of those are owned by customers and we want to leverage those as a resource. But the consequence of more generation coming from the customer is that we are using central generation much less, so the assets are starting to be underutilised and efficiency starts to erode. Their lifespan starts to diminish quite significantly when their efficiency drops down. We are investigating moving more from a central generation perspective to more of a distributed generation mix where Horizon Power makes investment in neighbourhood storage or circuit-level generation, circuit-level electric storage.

In some cases, we have actually taken steps of investing in consumer, behind-the-meter investments. We have a couple of trials; one of them, I think, some of this committee actually saw up in Carnarvon, in Gibson Street, where we are actually investing in photovoltaic for a customer rooftop. We also have neighbourhood storage and neighbourhood solar. The intent is to understand the consequence of moving from central generation to more of a distributed world. There is a lot of physics involved. As Mark just pointed out, the physics of it cannot be overlooked because when you start to have a saturation of DER on certain circuits, recognising that many of our assets have been in place for 30 or 40 years, they really had no intention of having bidirectional power flow. So when we look at these investments and the likelihood of growth of distributed resources, we have to understand the consequence actually to the whole system, not just our generation fleet.

So what we are doing is we are taking a couple of trials to look at, if we have really high penetration of DER in certain areas—Carnarvon and the Gibson Street theatre is a good example of that—then we can start to understand the consequence to the operation of our grid; and then in the future, as we make future investments, we ensure that we have invested properly for what we expect the customers to be developing on their own.

The CHAIR: What rules do you put around that investment? We are talking about an inherently monopolistic asset in the network component at least. How are you making the rules to determine

whether you go behind the meter, in front of the meter, what to build? How are you doing that? What is the framework you are using to make the rules determining your investment decision process?

Mr Mohn: Unless you want to speak to the rules yourself, for us it is a technology investment. Right now we are looking at the consequences of the technologies. In the past, we recognised that the consequences that I just mentioned on the distribution circuit are quite profound, so we have had to limit the amount of customer generation that we can allow. That rule has been in place, called feed-in management or distributor energy target for a specific area. What we have done is we have started to relax some of those targets because we understand over a couple of years of evaluating the consequence of DER that those targets are probably low so we can now start to lift them a little bit. But as we start to make further investments in the distribution circuits maybe we can encourage customers to generate more power. We do not try to inhibit as much customer-owned generation as possible.

The CHAIR: How are the signals coming through? How are you guaranteeing that the most efficient asset investment decision is being made? One of the key things you identified in your regulatory considerations, there is a chart here, figure 12, that says that the aims are —

> To promote efficient investment in, and efficient operation and use of, utility services.
>
> To promote competition in the supply of utility services.
>
> To provide investors with the requisite level of certainty.

Those sorts of considerations, those three drivers in particular, depend on rules, or you would think that you need some sort of framework to understand how you are promoting efficient investment, promoting competition, and providing certainty for investment. How are you doing that? What are your rules to create and encourage or to encapsulate those drivers?

Mr Curro: One of the first things we have had to do is recognise where the costs are within the power system, because one of things that has not been recognised in the past is things like ancillary services, whether they are just voltage support, or reactive-type support to the network, and for microgrids it is also spinning reserve-type considerations. The first thing is recognising where those costs are and who is currently paying them. Under the volumetric tariffs we have a problem, because they are not really recognised and usually not accounted for in the revenue. They are there in the cost but not in the revenue.

We believe that the key issue to this is really price signals and so that is why we have coined the MyPower product to be able to recognise some of the fixed costs, which are not only just plant but also some of those ancillary services, to send the signal to a customer to say, “Look, if you want to be part of this electron common, this is the cost to connect” and the price of energy really then becomes a secondary issue because, as in the MyPower product, the rules that are designed around it, the actual variable cost of energy is quite small at the end. The discussion comes around, “Is it more efficient for you to invest behind the meter or in front of the meter?” The MyPower product sometimes is seen as a blocker but, in actual fact, it encourages people to say, “Look, drop down a plan and you will save money from a connection point of view and do the business model or we can help you with it.” A lot of those rules are built into that.

We are working through the trials. We did the trial with MyPower and we then adjusted it based on the information we got and we have slightly modified it for both commercial and residential tariffs. A lot of the physics issues and cost behind it are being gathered through the trial that Terry mentioned, so once we set this thing up where it is basically an integrated microgrid, where are the

costs, what is actually happening and how much extra investment has to go into the network et cetera.

Mr Paterson: Adding to that and building on that, as we note in the submission, the process of the regulatory trial is actually in design phase so we are currently designing it. There has been an extensive body of work between a number of our team and the PUO, for example; in fact, a rhythm of meetings has been set up every month to go through an extensive level of detail. Inherently, the nature of regulation is that there is a level of complexity and minutia that needs to be actively negotiated. I know a number of our managers have been involved in that process. I think part of the challenge for the industry—I found this at CSIRO—is that we are in a stage of evolution of the industry where a lot of even the vocabulary and conceptual framing of things that we have used for a long time does not quite fit with where we are going.

What I mean by that is what we initially characterised as purely a regulatory trial, we have to come to see is more holistically about our entire operating model, particularly that interface between the regulatory constructs and, if you like, how the revenues flow and what the business models are for enabling more or less renewables in certain locations. I think at a very high level, the basic issue at hand with regard to the economic driver of the system really comes back to figure 3 in the submission, which is to best optimise expenditure on behalf of all citizens. We need to, as they say, sweat the assets. We need to utilise those assets in an efficient way. In other words, the more extreme the swings of loading of those assets, the more inefficient the economic investment on behalf of all of us and, therefore, the more out of whack and inequitable our pricing becomes.

As a first principle in our design, it is about the stabilising of asset utilisation because that is actually the economic driver. To be honest, sometimes things are as simple as that, because actually that comes down to the question of megawatts—what is the intensity of megawatts that a system is experiencing at any time? What is the intensity, which is the "head of the duck", as they say, and the "belly of the duck" is how hollow is that during the middle of the day, because that is actually where a lot of the erosion of that value is occurring.

The regulatory construct or the operating model for us is about saying, "How do we bring the technological elements together with what are more optimal regulatory settings? In our context, admittedly, as we have indicated today and previously, we have a reasonable degree of latitude simply by being vertically integrated and lightly regulated to kind of, if you like, do the things that the physics are requiring of us. In more heavily regulated environments, I think that is where a lot of the consternation arises because while the physics-based realities are requiring this, the regulatory construct from the past requires something else. Working with a lot of folks in the East, that is at the heart of the issue.

The CHAIR: We understand that, and I think we understand the operating and the physics that drive the decisions. The first part of our inquiry focused on that and we have heard from a range of industry participants here in WA. We have just come back from the States. What I really want to tease out is what you are doing around regulation. I guess I want to understand, if you are doing a regulatory trial and you are working with the Public Utilities Office, what are the workstreams associated with that, because at one end it can be about the tariffs that you show customers and different classes of customers and how those end-user tariffs are structured? There are also presumably some aspects in a workstream about how you price your network—where you show that pricing, too, is a separate question and whether you show that to the end user—to make sure that the right investment signals around location and technology, particular technological fits at a point in the network, where are the constraints? There is a piece of work how you price your network. There is a piece of regulation around how you procure assets in, from whom, and whether

that is something Horizon Power does itself or whether there is scope that other market participants can come in and provide those technologies. What are the rules around that?

I mean, you guys are in a position because you are unregulated and you do not have the systems and barriers that those in the SWIS do to really innovate on different regulatory models to send signals through to enable system-wide optimisation. I really want understand, because if one thing has been shown to us, it is that regulatory frameworks can send all sorts of perverse signals. I want to understand what you guys are doing because in the States, for example, and as your submission points out, in California they took a target-based, top-down approach. They set a target, the market met the target, it made the market and it has produced all sorts of perverse outcomes in terms of system operation.

In New York, they were bottom up: let us tell the market what the problem is that we want fixed and then market participants can come in, offer us any different range of technologies to fix that problem and they encourage it. It is a very different approach and they have amended their regulatory framework to accommodate that. What I want to understand is: in the absence of the traditional electricity network's access code framework that we have here in the SWIS, what are you doing in your sandboxes, what do you think is working and what can we learn from that?

Mr Paterson: There is a level of detail there that I think would be best for us to take on notice and provide a specific submission to you on the detail that is occurring in those working groups. As I say, it has literally been six to eight months of regulator meetings with PUO. Unfortunately Sami is not here. He has been closer to that. I would suggest, if it is acceptable to you, that we make a specific submission.

The CHAIR: That would be very helpful. That is what this part of the inquiry is all about. You guys are uniquely positioned, because of your vertical integration, because of your complete line of sight, from molecule conversion into electron, right the way through to consumption, to have a look at what is the most efficient way of encouraging these technologies, or not.

Mr Paterson: Absolutely.

Mr Mohn: You referred to New York. Obviously I understand the New York system pretty well. I come from California but I did work in New York when Audrey Zibelman was there. One of the things I am responsible for is looking at how we anticipate the conclusion of an independent power purchase agreement, because many of them are coming due and we have to renegotiate power plant and power procurement. This is not inside the regulatory framework just because we have latitude to make decisions as we wish. We actually are putting an expression of interest out to the market that is so much similar to the New York approach. In our first incarnation of this—it has not been released to the public yet for response—we said, "We have a power plant that is about to close. We have a challenge in procuring the right fuel source in this particular town market. What can you recommend to us as an approach, recognising that this is the design of our network market. Can you come up with a recommendation?"

Instead of being prescriptive and saying, "Please negotiate a new power plant for us," we are saying, "This is our problem. We have a power plant closure. These are our loads. These are load pockets. Tell us what you recommend for us." This is not regulatory. It is basically an experiment that we are going to take on to see if the market is intelligent enough that can drive our prices down on this particular town.

The CHAIR: Great.

Mr D.T. REDMAN: What we are talking about here is the fine-tuned part of the business in the sense that we know there are technical challenges out there and we know there are opportunities with the DER that are coming online. We know that the PV penetration is getting pretty high in some of those areas and that is causing those technical challenges. Where you have vertical integration, such as in the Carnarvon example, where you own all the assets going right the way through the supply chain and you can have control and charge over everything right down to tariff signals, that works.

I will give you one example of an outlier—I may have it wrong so you can clarify it if I have—and that is Esperance, where there is private-owned baseload generation coming in from an unregulated gas line. As I understand it, pretty soon you are going to market for that to extend for another period of time. Right now you have PV penetration and you are not allowing anymore DR into the system. That is a pretty blunt barrier to a system that you are trying to put a level of regulatory charge over to encourage all those opportunities to come to the table. Do I have it right that that is an outlier and, if not, are there other outliers that become challengers to what we might all be aspiring to; that is, a fine-tuned regulatory system that lands the best outcome?

Mr Curro: There are probably a number of outliers, and outliers for different reasons. The clearest highest cost we have in a lot of our microgrids is the cost of generation. It is by far the biggest cost. When we look at our total costs to supply, we are up at 50 to 60% of the total cost. The experiment that Terry talks about, we have already done in the Midwest towns. We went to the market and said, "Give us the best solution you can." We also threw in the fact that we were looking for renewable solutions as being the primary source of supply. This exercise happened about three years ago. It clearly came out that conventional generation was by far the cheapest at the time, from the market to us. What we then sought to do was build in flexibility in those contracts, where we can scale them back as we increase the level of penetration, to be able to have at least some lever in there. The key issue underlying all of that is reliability of supply to those customers.

The other problem we ran into was that the economies of scale are not there. You do end up with fixed costs that even the IPPs cannot do anything about—the tyranny of distance, servicing and all those things that were there. From a pricing point of view, we do have some levers but we do not have some other levers. It is clear that if we can encourage investment behind the meter, that will bring down those costs. It only seems to be at the moment that the biggest lever is on the variable cost, not on the fixed cost. We are working on that at the moment. That is part of the experiment we are doing in Carnarvon. We can send the right signals to get the overall cost down, so, build a smaller power station for a start, and have the variable costs of that power station as low as you can. We have already been through that exercise a couple of times. The market does not seem to respond that well because the economies of scale just do not seem to be there.

Mr Paterson: I was just going to add a couple of thoughts and maybe clarify, Terry, if I may that when you are referring to an outlier, you are referring to whether Esperance is a particular case in point that is not so much replicated?

Mr D.T. REDMAN: Yes.

Mr Paterson: Typically with our system blueprints approach, it has taken a holistic approach to looking at all of our 38 power systems to analyse what are the generation models, at what points in time do they roll off and how would that inform investment decisions on behalf of all of the people we serve. You touch on a very interesting point. Lorenzo Kristov in the States—I am not sure whether you came across him in your travels—has been one of the lead thinkers around regulatory change in the US. He makes an excellent point; that is, regulatory systems can be designed to achieve any outcome that policy makers want to be achieved, but that becomes impossible when policymakers actually do not have clarity about what they want to achieve.

Ultimately, a lot of motherhood statements get made around these things. In a sense we can talk about what is best. As I would often say in my CSIRO work, building a road map for the nation for a 10 year period, beauty is in the eye of the beholder. Where this comes to a very practical reality—let us take Esperance, for example, or any of our other towns. Around our own exec table we have extensive debates and discussions, on the one hand a beautiful future would be to increase to the absolute maximum the amount of solar connected to the system. On the other hand, that can have very significant detrimental flow-on effects, either to the state as a whole, to individual customers or communities, or all of the above. There is an inherent balancing act that ultimately, in the absence of clear signals from policy makers on behalf of society, it is actually very hard to construct an ideal regulatory framework because that needs to have a goal that it is aiming for.

Our approach to all of this is literally a balanced scorecard of outcomes, in the absence perhaps at times of real clarity. This is on multiple levels of government, even globally. Our focus here is about balancing three major things. One is about creating choice for customers where they are able to and they want to invest in customer-side resources. That is only a portion of our customers, but we still want to create options for them. We want to do that in a way that the investments they make at least are not detrimental to the societal system that we are custodians of, because that is our role: we are custodians of a societal system. In other words, we want to help them acquire solutions that at least are not detrimental or ideally provide services to the shared system. Thirdly, to do that in a way that helps to optimise and balance this system that moderates the need for state subsidies and ideally reduces that. Sometimes in the absence of that kind of clarity we say that, as custodians of the system, our role is not to appeal to just one stakeholder; it is actually to balance that. It is in a sense a clear sense of self-regulation to balance those outcomes.

I think maybe a couple of other examples: clearly in the world that is a higher DER future, we are transitioning to a world where 30 or 40% of all investment decisions are being made by customers, whether they are business or residential. There is a major power shift, if you like, from even the kind of influence of regulatory systems in the past that were designed to manage on behalf of stakeholders the power of a monopoly, those powers are necessarily eroding because of this shift in economic investment and decision-making by customers. Where in a sense pricing structures become an important proxy to regulatory constructs, if these folks out here are now making a whole bunch of decisions, without having to do a masters in energy systems, because all they want to do is get on with their lives, get dinner on and get kids to soccer, pricing systems become a critical proxy.

The CHAIR: But pricing systems are regulatory structures.

Mr Paterson: Correct.

The CHAIR: A market only exists because a government decides to create or allow one.

Mr Paterson: Right.

The CHAIR: So there is not necessarily a distinction between the two?

Mr Paterson: No.

The CHAIR: And the decisions that customers are making are in response to price signals from a market structure that the state government has created?

Mr Paterson: Correct.

The CHAIR: The interesting part of the dynamic, and particularly one that I really want to explore with you, is that the State Government owns the largest generation retailer, the monopoly asset distribution transmission asset owner in the SWIS, and the vertically integrated entity that is Horizon

Power. The State Government, as the owner of this social asset or these social assets, can do an incredible amount. There is a construct, an artificial set of rules and market delineation that has been created between the south west interconnected system and the rest.

I would be very interested in your views on the footprint and the definitions that the *Electricity Corporations Act* places around your area of operations, the sort of pricing and market signals and structures that inhibit or enable these technologies based on the definition of the SWIS, where Western Power operates, where Horizon Power operates, a bit of an exploration against the creation of a market, the sending through of price signals, and your views on that.

Mr Paterson: Thank you, Chair, for that question. There are a lot of sub-questions in there, which are excellent sub-questions, I might add. Perhaps if I kick off, and I am sure you gentlemen will have things you want to comment on.

I think the question of the boundaries of the system, obviously they are an arbitrary kind of delineation that has been made at a point of time for a whole bunch of good reasons. I think the way that we would think about this is that there are quite different types of electricity systems, and they are, if you like, by definition, requiring different types of social regulatory pricing constructs that are kind of fit for purpose—many similarities; some differences. With regard to the SWIS, I think the simplest definition of the SWIS itself is less about geography and more about connectedness.

The CHAIR: So the meshed versus distributed parts of the system?

Mr Paterson: That is right: is there ultimately a natural air gap between what is connected with copper and what is perhaps on the perimeter of that. So, in a sense, there are lots of ways to define the geographic boundary, and it might be what we have traditionally called fringe-of-grid. I note that our colleagues at Western Power are more talking about autonomous power systems now and sort of conceptualising about 50% of their territory which they would consider as kind of not fringe-of-grid but a very low population base.

I guess, to take the standalone power systems example as a case in point, I think we as a business have been on the journey with the PUO now probably for just over 12 months of really working through the detail of what are the options and what are the optimal choices with regard to regulatory models and really market structure models, because it is not just regulation. It is, as you say, about market structure models. A very simplistic way of thinking about this—I am simply using SPS as a proxy or as an example; probably maps to microgrids as well, particularly remote microgrids—is that a vertically integrated technology stack actually strongly correlates with a vertically integrated market structure and regulatory construct. It just makes life infinitely simpler.

That has actually been manifest in the yet-to-be-released issues paper that the PUO is releasing. As I understand it, the draft that I have seen has three levels of regulatory change. One is minor or minimal—that is actually just assigning those customers to Horizon Power—one is moderate, which involves a role for Synergy; and one is significant I think is the language they use, which is trying to, if you like, reverse-engineer a regulatory construct designed for quite different purposes to sort of shoehorn in some of these technologies. My simplest take on this is that the nature of the engineering and technological systems and the communities they serve, rather than an arbitrary geographic footprint, is actually a more natural and more defensible construct for how you would actually apportion who does what.

There are probably some other things that I could add to that, but I want to pause and let my colleagues respond.

Mr Curro: I would actually go a step further. My understanding of the way New South Wales split up utilities is because of the fact that you have a very different business model very close to Sydney versus the very outer rims. Essential Energy, who has also always managed the outer rims, has a very different business model, because essentially you do not make a lot of money out of a piece of wire where you do not have a lot of energy flowing through it, therefore you have to come up with different technologies, versus the CBD—just like our own CBD—where you can make a lot of money and you have very different technologies used.

So I think it comes down to, as you move towards the extremities of the SWIS, not only do you look at standalone options as being a very viable option, because the actual cost of service is well above $1 in a lot of those places, well and truly. The other issue is the reliability just gets poorer and poorer and poorer as you go out further.

Mr D.T. REDMAN: When you say $1, that is $1 per kilowatt hour, is that?

Mr Curro: Yes, and that is just simply capital recovery of those lines, where you have very, very little flowing through those lines but you have exactly the same infrastructure as you do close in. So microgrids and standalone power systems provide a different technological solution, but it also provides a different business model. You have to provide incentives to get things happening differently in those remoter areas, because at the end of the day, if you put the customer at the centre of it, which is what we try and do—it is all about reliability and pricing at the end—but if you do not reflect that pricing to the customer, you get the perverse outcomes that we get at the moment, and there is an expectation of higher reliability as well, and rightly so. Why would there not be? But you cannot provide it. That is the issue: you just cannot provide it. So I think it is a business model issue as well as a regulatory model issue.

Mr Mohn: I would just add one thing, to further what both gentlemen said. We were actually invited by LandCorp to make a recommendation on a system that they wanted us to consider within Western Power's service territory, and we went through some discussions with the PUO about the best way to approach LandCorp. LandCorp recognised us as experts in building microgrids. It really wanted a microgrid in this one facility that they wanted to construct, so we were willing to put a proposal in front of them. But because of the way in which the regulatory regime had been interpreted over many years, that same regulatory thinking went into the response back to us, which was, "That's Western Power's territory; don't get involved." They very gently let us down, saying, "No, you really don't need to be involved in that."

We have so much expertise that we can offer other parts of the state, but because of the interpretation of the current code we are prevented or restricted from participating. The outcome of that was we commented to LandCorp, "Listen, if you want us to help advise you on the design of a microgrid, we're happy to do that. You have to get back to us and let us know." But really their intent was, "Please help us design and build a microgrid, perhaps even own the assets on our behalf." But, again, the interpretation of the code was, "That's not your space, just don't go there."

The CHAIR: Why can you not work with Western Power on that? You are both owned by exactly the same shareholder.

Mr Mohn: Exactly.

The CHAIR: I am getting the sense across the GTEs that there is a fair bit of duplication and overlap going on. There are an awful lot of people competing in this space, and I would observe that the three GTEs all seem to be doing a lot of the same stuff in competition with one another, almost, and at the very least potentially not collaborating as best they could. What is stopping that, or who should be doing it?

Mr Paterson: I will be a little politically incorrect here.

The CHAIR: Fire away.

Mr Paterson: I realise I am on record too. I think it is a very accurate observation, and it is something that we have been actively—and I say "actively"—seeking to break down. We are the small brother in this equation. Since coming to the state, I have had numerous meetings with the other GTEs in the spirit of seeking to advance some more collaborative —

The CHAIR: And efficient.

Mr Paterson: — and efficient, because the bottom line is the premise of your statement is the only reason any of us get paid is to provide services to the citizens of Western Australia: not our own little patches, not our own little fiefdoms, not stroking our little egos, but it is about the state of Western Australia. It is very notable to me how parochial some of those relationships have been. Again, I realise I am being politically incorrect. I will not name names, but there are a lot of sensitive male egos that need to be out of the way in this whole topic.

So the State Government should absolutely be expecting clear evidence—not just words but clear evidence—of your GTEs actively and dynamically collaborating and actively deciding who is leading on what topics, and not competing, because in the context where there is significant duplication, that often cannot be defended on the basis of it being intelligent duplication. Sometimes there is a good reason to duplicate. What it does is it diffuses effort across the whole suite of things that need to be done.

I guess just one example from my mind: I think what is not getting the attention that would really benefit the state here is for us to be—a lot of effort has been going into what you might call the more extreme fringe-of-grid sort of areas. Now, for us, that is obviously what we do. We are by definition a remote and regional power system operator. There are a lot of very significant issues that large mesh networks must confront. New York state is a great example where, under Audrey's leadership, they have looked at key architectural shifts that need to happen for large mesh networks to have a future, and here we are talking about existential threats that ultimately the state will have to underwrite if we do not get it right. So I guess all I would say there is at the heart of duplication often is role confusion and lack of focus on particular and distinctive areas. There is no reason why we should be competing and having kind of sensitive egos.

Mr Curro: I think that also extends to the multi-utility discussion, about what is best for the customers, and particularly in the remote areas. As I say, it is not just an energy discussion here. I think to some extent we hide behind —

The CHAIR: Can you just expand on that point a little bit, Laurie? When you talk about multi-utility, is that water, wastewater —

Mr Curro: I am talking particularly water, not so much telecommunications. I mean, we deal a lot with a lot of the remote Indigenous communities, as an example, and we believe that there is no point having efficient solar water pumps that just generate water and then it just goes flowing down the drain at the other end. So unless there is a total holistic approach to that, the state will lose out, but—very importantly—the community does not gain anything out of it. So I think certainly water, wastewater, efficiency around that, and one group servicing that community rather than sending multiple people. With our remote utility community workers that we initiated, as an example, we were trying to use local people to service their own infrastructure, and create jobs, but do it as broadly as they can.

The CHAIR: If we had time, I did want to explore this with you: recommendation 5 in your paper talks about recognising remote communities as microgrids and independently benchmark existing approaches against world's best practice to ascertain the value of a multi-utility approach. In the preceding paragraph, you say that Horizon Power suggest a different approach to these communities, but do not go into any detail. I am happy for you to take that on notice, because I know that we only have 10 minutes, but it is an issue that this committee—well, I personally; I do not know about my colleagues—we would be very keen to receive some additional feedback on that, because this is a very vulnerable part of the Western Australian community. So if you could take that on notice for us, we would appreciate that.

Mr Curro: Absolutely. I would love to, yes.

The CHAIR: I guess the other thing as part of that discussion—I will just table this, because we have 10 minutes, and there is just one further issue that I want to air—that is the Bankwest Curtin Economics Centre document that was released in September. Power plans for electricity; the impact of tariff structure changes on energy vulnerable households, which I know was a trial that Horizon Power was a key partner in. It was your customers that were participants in the trial. So I just want to flag—as well, I am happy again to take your views on that on notice as a supplementary submission—a bit of a view on Horizon Power's thoughts on that, how that trial went, and what your views are on the findings of that report would be particularly helpful.

With the 10 minutes left, I am sorry to jump around, but I guess I flagged with you two things we would appreciate some additional views on. I want to come back to a comment that you made, again in figure 12, where you have talked about avoiding cross-subsidisation between classes of customers in the way that you have constructed your tariffs, and presumably again we come down to market structures driven by regulation and the categorisation of classes of customers and cross-subsidisations. I want to tease this out a little more on Horizon Power's views on this.

There is, if you like, almost a three-tier categorisation of all segregation of the market into residential, small business, small connections, commercial, and also maybe we can talk about large connections and smaller commercial connections. I am interested in your views on how you currently treat those customer classes, your views on cross-subsidisation, but particularly in the small-use customers: they are all treated the same, but are there cross-subsidisations going on between classes of customers, particularly those who have distributed energy resources and those who do not? I guess I just want to have an exploration of your views on customer segregation and cross-subsidisation.

Mr Paterson: Just to clarify, with specific reference to small-use customers in particular?

The CHAIR: I think that is probably where this discussion is most relevant, and probably less so in your patch, with the large-use commercials.

Mr Paterson: Sure. I might lead off, and again we will see if my colleagues have things to add. The cross-subsidisation is an indirect issue in the sense that all of those small-use customers are exposed to the same unit price, a kilowatt-hour price. By "indirect" I mean that some customers—usually higher-wealth customers—are in a position, particularly if they own their own property, to invest in solar and then self-generate. If you like, rather than people used to talk about grid defection—in other words, people completely disconnecting from the grid—what has actually become far more prevalent and really one of the greatest threats to the economics of the system is load defection, so in other words those higher-wealth households doing what right now the regulatory and market environment tells them and encourages them to do, which for them is completely economically rational and a moral response. The reality is that that has actually incentivised some citizens to make

those investments: to still depend largely to the same degree on this shared system, but actually pay a much lower contribution towards its maintenance.

The CHAIR: Let us be specific about what we mean by grid defection, because grid defection is both a grid source supply or a complete disconnection. What context are you using that terminology in?

Mr Paterson: That language is being specifically used now to refer to complete disconnection from the grid. There is no copper between the grid and the customer. Load defection is where a customer quite happily retains a connection to the grid. This is the vast, vast majority of customers. Any side of 20, 30, 40 or 50, it is load defection, which is where the customer retains that connection and essentially uses that connection as a community-funded battery, because that is actually what it is doing. They are functioning as a generator for all of the daylight hours. They are utilising that to use as many electrons as they can and then reverting to dependence on the community-provided battery overnight and recognising that the overall contribution they are making to that system is significantly less than the other folks who cannot do that. As I say, that is at the very heart of the cross-subsidy. It is not manifest direct to customers simply because customers are not exposed to the true cost of electricity with volumetric pricing.

The CHAIR: I want to tease that out in another level of detail. That relates to the inherent cross-subsidisation by customers in the SWIS to customers in the regions. I would be very interested in your thoughts on the degree to which the true cost of energy production is shown to end users because there are going to be major equity issues and significant price, without distributed energy—or with. If you were to show customers the true cost of the electricity production, that is going to impose, I would argue, unreasonable hardship on regional communities.

Mr Paterson: Absolutely.

The CHAIR: There is a public policy good to be pursued in levelling the cost of energy to regional customers. What are your thoughts then on appropriate price signals? We come back to appropriate signals, frameworks, to encourage these technologies.

Mr Paterson: A quick thought on this. I have had the privilege—I think it is a privilege—of being involved in the demand response space for the past 15 or so years. Often it comes down to making sure that all of the people around the table understand megawatts or kilowatts, and megawatt hours or kilowatt hours. At the moment at the heart of the issue—I completely agree that there is a wider societal issue for the state of Western Australia in terms of do we really want to expose our regional citizens to the full cost of energy. That is a specific societal topic in itself.

If we just put that to one side for the moment and we say that assuming that at a societal level we want to share some of that cost across the state, there is a secondary question which is: do we still want our citizens in the regions to receive some kind of signals as to the fact that there are more extreme-type times at which operating five split systems in the house actually drives up the overall cost for the state in a very extreme way. There is always a proxy-type relationship with trying to balance multiple things.

The basic problem we have right now is that we have such a blunt instrument that we have no sense in which as citizens we together have any sense of our impact on the shared system. Often recently we have been using the term “electron common” simply because in a context where some people can quite happily be incentivised to overfeed their stock, as it were on the commons, you accelerate the tragedy of the commons. Intelligent pricing structure is not a rational economist’s dream where you perfectly signal every last cent to multiple decimal points of the cost. It is more about providing nudge-type signalling to customers to say that at these points of time, by simply moderating their

use, that has an overall societal outcome and an outcome for you. That is really the art in pricing structures.

Mr D.T. REDMAN: Just to expand on that a little. I am not sure I am an advocate of it, but in the issue of water pricing there are uniform pricing tariffs of water but only for the first 300 kilolitres or I think up north it is 500 kilolitres, or something like that. I am assuming that what you are talking about is that once you go into higher use, although there is a uniform pricing tariff across the state for electricity, there are higher cost implications for those that go beyond a point and perhaps price signals might be a strategy for managing that.

As these tensions start to emerge—you mentioned earlier the difference between your volume charge versus your fixed charge—I can imagine that one of the responses from a utility, if you are taking a very efficient approach to it, is that you have to find a way to capture some of that back, even if it is for the price of the ancillary services that you provide and/or just to maintain the infrastructure. That has the risk of emerging at a point in time where suddenly it is no longer load defection; suddenly a bucket load of grid defection comes into the game because you have priced it up. Is that a risk and, hence, there has to be a certain amount of subsidisation in terms of maintaining grid efficiency?

Mr Paterson: That is a great question and my answer to that, in a very accelerated fashion, is that what utilities have not done traditionally is think about challenges through the eyes of customers. We tend to think about the problem that we want to solve and how do we impose it on customers. But the reality is that if in fact the physics of electricity mean that intensity of demand—in other words, how big does the pipe need to be, how many kilowatts do I need at any point in time—the physics actually drives those fixed costs.

One of the ways we can find a balanced scorecard for our customers is not just to say that we will whack you with a fixed charge; it is actually to say that we will work with you to create solutions that help moderate the intensity of your demand at those critical times, because this is all about a quid pro quo. It is about trade-offs. It is about saying that to be customer-centric we know that you want to actually reduce your bill, or at least stabilise it. We know that we need to manage a balanced system. Sure, we will have a pricing structure, but we will support that with supporting products that make it really easy for you to reduce your demand and reduce your exposure to those elevated costs. It is at the heart of design thinking: how do we create solutions.

If I was to make one quick comment, you did mention before about the MyPower trials and so on. Pricing transformation globally is one of the most politically vexed topics. There have been a gazillion trials—a technical term!—and very few implementations. A premise I have brought from the behavioural economics work that we did at CSIRO was that you need to construct products that have a capability of going viral. In other words, if we are waiting for the politically ideal situation to make significant change, we may be waiting a long time.

But if we are doing our job as professionals and we are thinking about our customers and our communities—it is individuals and community, not just one or the other, it is both—and we are using that to design the solutions that are a win-win-win, then you actually are designing things that people intrinsically want. That is our job. It is our job to try to make it easier, if you like, for the politics to happen. I can give you examples of where that has happened, but time is probably —

The CHAIR: We are five minutes out; we will have to wrap it up soon.

Mr D.T. REDMAN: One strategy is the roll out of advanced metering, which gives you the tools to be able to achieve some of those discussions. I understand that Horizon made a submission to the ERA in the Western Power access A4 in support of Western Power's proposal to deploy advanced

metering. The ERA did not support it. Why is that, if that is what you just talked about and the focus is on customer and hence the tools in order to be able to have that customer discussion?

Mr Paterson: It is an excellent question. A quick comment, and Laurie may have a comment —

The CHAIR: It is going to have to be really quick because we have another witness waiting. I am happy to take it on notice. If you want to give us your thoughts on notice, that might be the more sensible way. I am so sorry; I feel really bad, but we have other people waiting and everyone is running against a hard deadline of 12 noon today. It is such a shame we do not have more time.

I will proceed to close today's hearing and thank you for your evidence before the committee today. A transcript of this hearing will be emailed to you for correction of minor errors. Any such corrections must be made and the transcript returned within seven days of the date of the letter attached to the transcript. If the transcript is not returned within this period, it will be deemed to be correct. New material cannot be added via these corrections and the sense of your evidence cannot be altered. Should you wish to provide additional information or elaborate on particular points, please include a supplementary submission for the committee's consideration when you return your corrected transcript of evidence. Thank you so much. That was a really interesting discussion. I really appreciate it.

Hearing concluded at 10.36 am

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