LEGISLATIVE ASSEMBLY FOR THE AUSTRALIAN CAPITAL TERRITORY

STANDING COMMITTEE ON ENVIRONMENT, CLIMATE CHANGE AND BIODIVERSITY

(Reference: Inquiry into Renewable Energy Innovation in the ACT)

Members:

DR M PATERSON (Chair)
MR A BRADDOCK (Deputy Chair)
MS L CASTLEY

TRANSCRIPT OF EVIDENCE

CANBERRA

TUESDAY, 6 JULY 2021

Acting secretary to the committee:
Dr F Scott (Ph: 620 75498)

By authority of the Legislative Assembly for the Australian Capital Territory

WITNESSES

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Amended 20 May 2013

The committee met at 2.48 pm.

SIBLEY, MR JON, Principal Policy Advisor, Australian Renewable Energy Agency

THE CHAIR: Good afternoon and welcome to our third hearing of the Standing Committee on Environment, Climate Change and Biodiversity inquiry into renewable energy innovation in the ACT. Before we begin, on behalf of the committee I would like to acknowledge that we meet today on the land of the Ngunnawal people. We respect their continuing culture and the contribution that they make to the life of this city and this region. This self-referred inquiry started on 23 February 2021, and the committee has received 22 submissions, which are available on the committee website. Today the committee will hear from the Australian Renewable Energy Agency, ARENA.

We will move to our first witness, Jon Sibley from the Australian Renewable Energy Agency. On behalf of the committee, thank you for appearing today. My name is Marisa Paterson, and this is Leanne Castley. Andrew Braddock is on the phone. The privilege statement on the table. Can you confirm for the record that you understand the privilege implications of this statement?

Mr Sibley: Yes, I do.

THE CHAIR: Thank you. Would you like to give us a brief opening statement?

Mr Sibley: I am Jon Sibley. I am representing the Australian Renewable Energy Agency. Just for the record, I have been an ACT public servant in the past, working on renewable energy, climate change and industry development in EPSDD and the Chief Minister's directorate. I have a few notes on ARENA projects in the ACT. I thought it might be useful to cover those off quickly, and maybe give a couple of observations.

The first thing to say is that the ACT generally punches above its weight in terms of its contribution to renewable energy innovation in Australia. I think that is reflected in the fact that it has received about four per cent of ARENA's total funding even though it has only 1.7 per cent of the Australian population. Most of that funding, 69 per cent, has gone to the ANU, especially in the area of solar research and development—the design of photovoltaic cells. About 38 per cent of the total funding has gone to solar research and development.

I will make a couple of observations. The ACT does appear to have some specific competitive advantages with regard to attracting renewable energy businesses and fostering innovation in this sector—one of which is its institutions and labour force. So the Australian National University, as well as a number of private sector organisations, are key contributors to research and development and innovation in Australia. The government's policy settings have obviously been instrumental in attracting some businesses here as well as catalysing some new commercial activity and innovation. In particular, going forward, areas such as electrification, the uptake and the grid integration of electric vehicles and hydrogen look like very prospective areas.

Also, importantly, its location within New South Wales in the context of the New South Wales electricity infrastructure roadmap—which is a very ambitious renewable energy

development policy—may provide opportunities for the ACT. ARENA has been re-funded for a further 10 years, so there is continuing opportunity for ACT businesses and researchers to apply for ARENA funding in this area.

THE CHAIR: Is ARENA based in the ACT?

Mr Sibley: ARENA has offices in Canberra, Sydney and Melbourne. At a guess, I would say approximately half the staff of ARENA are in Canberra. A large proportion are in Sydney.

THE CHAIR: So it is predominantly research?

Mr Sibley: It is research, demonstration and deployment. It sits in the innovation chain between early-stage research and development—the fundamental research that universities tend to do and the kind of commercialisation and deployment stuff that the Clean Energy Finance Corporation funds. We sit in that middle ground, and I think we tend to move around a little bit, depending on where the biggest impact is. So primarily its ideas are definitely out of the lab. People are looking to put them into practice in the market and they are looking for funding to get them over the line in terms of their first near-commercial deployment. That is typically the space we are operating in.

THE CHAIR: So it is technical sorts of development rather than social sciences research or anything like that?

Mr Sibley: Yes. I think it is quite broadly defined. Very much there is a technology demonstration element to it—things like solar thermal or batteries or other technologies. We were very active in the large-scale solar space before it became commercial. But there is also a lot of focus on commercial innovation—new business models and concepts that can enable the renewable energy transition but may not necessarily have novel technology associated with them. There has been a focus on social science in some areas—such as consumer uptake of smart energy devices, distributed energy resources, batteries, demand response and things like those.

So it is quite open and the organising principle for it is alignment with ARENA's funding priorities. The funding priority relevant to this committee is the grid integration of renewables, and there is also a priority for hydrogen and electric vehicle integration.

MS CASTLEY: I do not have anything specific, except that I imagine there is quite a broad range of things that are going on. What do you think is the hottest, newest thing that we might not know about yet?

Mr Sibley: It is a great question and I wish I knew the precise answer, because I would probably invest in it myself! But, generally speaking, I think we are moving from a stage where large-scale renewables are now becoming commercial. There was a huge focus in ARENA, in past years, of getting the industry to that point—facilitating the upscaling of solar generation and getting that deployed. Now we have moved past that. That really is a commercial opportunity now for people in the industry.

We are in a process where we have been funding a lot of large-scale batteries to demonstrate innovative services like frequency control. We have a project which is

looking at how batteries can provide the kinds of services that in the past only thermal generators were able to provide—things like inertia and system strength. We have got a few projects there. I think there is more work to do there, but that is also becoming quite commercial now.

Areas where we see that there is a really significant role for government going forward include hydrogen—demonstrating the technology and commercial models that can enable hydrogen to play its potential role in the energy transition, including in terms of large-scale exports of hydrogen, but also its application for decarbonising gas networks and potential in transport, including long-haul transport, shipping and things like that.

One of the interesting things that comes out of the modelling when you are looking at moving to high penetration of the variable renewable energy sources like wind and solar is that the flexibility of the demand side—how people use energy—becomes much more important and much more valuable. If they can shift their usage to times when it is sunny or windy, then they can take advantage of much lower-cost power. So, it is a continued focus of ARENA to look at how the demand side can play a greater role in balancing the overall power system, resulting in lower costs for consumers.

I think electric vehicles is another key area. It is widely anticipated that electric vehicles will come to dominate the market over the next couple of decades, and that could be a really good thing or a really bad thing for electricity grids, depending on how they are integrated. So there is a focus on how we can have smart controls for those vehicles to ensure that they are charging at the lowest-cost time—when it is sunny and windy, effectively.

MS CASTLEY: And is that user education? How are we going to tackle that? The push is really for electric vehicles, but I am not sure that that conversation about not impacting the grid—the message about charging times, et cetera—is clear. I had not heard about it until these committee hearings.

Mr Sibley: Yes. There is a behavioural aspect to it. What happens in the electricity market is that every five minutes, the prices change. So it may be $15,000 a megawatt hour on the wholesale market in one five-minute interval and minus $1,000 in the next interval. It is one of the most dynamic markets in the world, and that kind of volatility needs to be balanced at a pace, I guess, at which you would not really rely on individuals to be making decisions. It tends to be automated. So we are very interested in the sort of control algorithms that can balance what consumers want—that is, they want their vehicle to be charged when they need it—with getting the electricity at the lowest price from the wholesale market. That will require intermediaries, like electricity retailers or other forms of aggregators, to manage their participation in the wholesale markets.

MS CASTLEY: Thank you.

MR BRADDOCK: I just want to understand a bit more about ARENA's project investment in the ACT in terms of distributed energy research. Can you just give me a bit more detail on that?

Mr Sibley: Sure. The ACT has had some really leading projects in this space, actually. It is obviously home to companies like Reposit Power—a very early mover in the area

of virtual power plants and still one of the leaders nationally in that space. They have been funded directly by ARENA for various projects, but they have also come in under other projects as, I guess, the technology provider. So they have been a recipient of funding there.

Other businesses like Zepben, or Zeppelin Bend, which is a very innovative company looking at software that can help grid operators understand what is happening on their grid and understand where batteries and EVs and things like that can be used to solve grid problems. So, there has been funding for Zepben to do projects in that space—not just in the ACT, but nationally.

There is the ActewAGL-led REVS project, which is about demonstrating the ability of electric vehicles to provide services to the grid—such as what we discussed earlier—by managing their charging around the price volatility in the wholesale market as well as providing frequency control services to AEMO. They are probably the ones that jump out at the moment. There have been, I think, 64 projects in total that ARENA has funded in the ACT. The other one is a thing called the Distributed Energy Integration Program, which is a collaboration of all the market institutions—the Australian Energy Market Operator, the Australian Energy Market Commission, the Australian Energy Regulator and the Energy Security Board, along with a host of industry representatives and consumer groups—which is looking at how to coordinate the reform agenda nationally to make sure that it is streamlined for the integration of distributed energy resources. ARENA has initiated that collaboration and provides resources towards that collaboration. The Australian National University is involved in a number of the workstreams there, as well.

MR BRADDOCK: Right. So, with the government's upcoming investment in batteries, would that be an opportunity for ARENA to potentially fund more research in the ACT to see the various models that have been working and the best way to support the grid?

Mr Sibley: Yes. I am sort of familiar with the next gen battery program; it was one of the things I was involved in when I was with the ACT, and I know that part of the rationale for that was to demonstrate innovation as well as generate data that could be used for analysis for research or commercial applications. I imagine that that is a continuing opportunity. ARENA's focus is moving somewhat away from funding battery deployments or battery rollouts, largely because we have observed that a lot of the really important things that distributed battery storage can do are actually already quite well demonstrated now. So it is really now up to the market to work out how to roll them out. And if consumers do want them on a long-term sustainable basis and if battery costs can come down, then that will be a bit part of the future. That is not something that ARENA can really shape now; that is up to those broader questions of cost and consumer appetite and things like that.

One area where we think there is a need for further work is: if you have a battery, an electric vehicle, some solar panels and a water heater at your home, how can all those things be coordinated to provide an overall service at the point at which you are connected to the network? Typically, the BPP work to date has used a single appliance, like a battery. Sometimes they use a pool pump or a hot water service to provide demand response, but typically they are only really focused on one device in a home or a business. As all our devices become more capable in the future, there is a need for them

to be coordinated. There are some really tricky problems around that. If there is a limited amount of energy that is available at a certain price, who gets to use it behind the meter? Does it go to heating your water or charging your battery or cleaning your pool or whatever it is?

There are consumer protection issues there. Standards around interoperability between the devices are required, and there are software architecture issues that need to be resolved as well. So that is something that is identified as a priority through the Distributed Energy Integration Program, and ARENA is funding a study initially just to explore that and to scope out the state of knowledge in that market at this time.

THE CHAIR: You were talking about collaboration and initiating collaborative projects. I guess that is a part of the terms of reference of this inquiry—how can we best facilitate collaboration between different sectors and maximise the result? What would you say, in terms of understanding the ACT environment, we could do to further support collaboration?

Mr Sibley: It is a really challenging one because collaboration happens already, but not necessarily always in line with people's expectations of this accelerated rate of innovation. One of the important areas for collaboration is obviously between research and business, and I think the ANU has made some moves—for example, through projects like their DER lab and also the battery storage integration program—to provide a bit of an applied research focus that is more relevant to businesses and might facilitate productive collaboration with business. I think ultimately if the ACT wants services commercialised locally, then that is going to be a really important thing to achieve.

CIT obviously has its renewable energy skills centre collaborating with industry ahead of what is expected to be a very significant boom, especially in wind and potentially solar in New South Wales flowing from the New South Wales roadmap. Their legislated target is 12 gigawatts of generation, which is about 20 times what the ACT funded through our reverse auction program. So, a huge amount of investment is happening in New South Wales, and thinking about how the ACT economy can organise itself to prepare for that opportunity to provide services to that broader market might be an opportunity.

One of things we have observed through the Distributed Energy Integration Program is that when you get stakeholders together in a room, you can normally distil from all the noise and opportunities in the environment some concrete priorities that you could focus on. In the context of the Distributed Energy Integration Program, that has been mainly around identifying the reform priorities. But I do remember that, when we were developing the renewable energy industry development strategy in the ACT, we had workshops with industry that were productive in that area as well.

MR BRADDOCK: I have a follow-up question. You were talking about the smarts to integrate batteries, vehicles and solar panels. Can those smarts also consider transition off gas and onto electric?

Mr Sibley: Yes. In electrification, obviously the ACT is leading in terms of its policy position in that area. It does create challenges and the ACT, I think, will be one of the first areas to experience those challenges, especially when it comes to the fact that most

of its energy goes into heating, and that a lot of that is supplied by gas. So if you transfer the heating load from gas to electricity, it is a very large amount of additional electricity for the grid to supply. How that is done will make all the difference as to what the cost implications are for consumers—whether there is a need to upgrade substations and feeders and things like that in that transition. Those smarts will come into play there.

There will be a software element in terms of coordinating them with batteries and solar and things like that, but there are also some fundamental engineering hardware issues that will need to be solved around how you can store energy during the day to heat your house in the evening when you most want it. Obviously, batteries are one way of doing that, but they are a relatively expensive way of doing it. Batteries are generally quite energy limited. I have a battery. It has a 10-kilowatt-hour capacity, but I would need three times that amount at least to keep my house warm in the evening. So that is a key challenge. Things like thermal storage—heating up water or some other medium during the day so that you can then draw down that heat at night—is another really interesting area. Personally, that it is something I am interested in, but it is just one example of the kinds of challenges that will need to be addressed in Australia and globally, especially in cold climates, in the electrification process. That might be something that the ACT could take advantage of in terms of its leadership in its policies in that area.

THE CHAIR: I have just one further question around what you said about attracting commercial interest. Is that part of the projects, or are the projects just innovative and then they will go out and try to create commercial interest in that?

Mr Sibley: ARENA funding looks for a couple of things. It looks for commercial co-investment or co-investment if it is a university. Total funding of $67 million in the ACT has delivered total project value of about $185 million. So, that is a leveraging ratio of about 2.7—for every dollar that ARENA invests in the ACT, there has been $1.70 additional of co-investment funding. That is one indicator that other people have skin in the game. It is not just a good idea that a researcher has thought of; there are people that are willing to put their own money in it as well. That is a key indicator.

THE CHAIR: How does that compare to other states?

Mr Sibley: I am not sure. I have not done that analysis. But generally speaking, ARENA would only, I think, fund up to 50 per cent of a project. We also look at the pathway to market. Obviously, ARENA wants to fund the prospective technologies that are going to have the greatest impact on the ground at the end of the day, so we carefully assess that pathway to commerciality for that initiative. That is not to say that we expect everything that is invested in to be successful; you have to back a few horses, if you like. But, yes, that is a key test that is applied through the proposal assessment stage.

THE CHAIR: What about intellectual property? Is that a big issue for you guys? How do you work that out?

Mr Sibley: Obviously, it is a requirement that the project has the intellectual property that it needs to implement the project. ARENA does not hold intellectual property, so that is really sorted out by the project proponents themselves.

THE CHAIR: Yes. Thank you very much for your time today. It is greatly appreciated.

Mr Sibley: No problem at all. It was a pleasure.

The committee adjourned at 3.15 pm.