REPORT ON PROCEEDINGS BEFORE

LEGISLATIVE ASSEMBLY COMMITTEE ON ENVIRONMENT AND PLANNING

INQUIRY INTO SUSTAINABILITY OF ENERGY SUPPLY AND RESOURCES IN NSW

At Sydney on Tuesday 29 September 2020

The Committee met at 10:35.

PRESENT

Mr Alex Greenwich (Chair)

PRESENT VIA VIDECONFERENCE

Mr Anoulack Chanthivong
Mr James Griffin
Mr Nathaniel Smith

The CHAIR: Before I start, I acknowledge the traditional owners of this land, the Gadigal people of the Eora nation, and pay my respects to their Elders past and present. I also acknowledge the traditional owners of the lands upon which members and witnesses are joining us virtually today. My name is Alex Greenwich and I am the Chair of the Legislative Assembly Committee on Environment and Planning. Mr James Griffin, the member for Manly, and Mr Nathaniel Smith, the member for Wollondilly, are joining us via videoconference. Mr Anoulack Chanthivong, the member for Macquarie Fields, will join us via videoconference a bit later. Ms Felicity Wilson, the member for North Shore, is an apology today as she is on maternity leave.

This is our fourth hearing of the Inquiry into Sustainability of Energy Supply and Resources in New South Wales. We have witnesses taking part via videoconference and also attending in person at Parliament House. The hearing is being broadcast on the Parliament's website. I would like to thank everyone for appearing before us today. We appreciate the flexibility of everybody involved, especially those attending via videoconference. We will now begin with our first witnesses.

DAVID HARRIS, Research Director, Energy Technologies, CSIRO Energy Centre Newcastle, before the Committee via videoconference, affirmed and examined

DAMIAN BARRETT, Research Director, Energy Resources Program, CSIRO Energy Centre Newcastle, before the Committee via videoconference, affirmed and examined

The CHAIR: Dr Harris and Dr Barrett, do you have any questions about the hearing process before we start?

Dr HARRIS: No, we are okay. We have been reasonably briefed. Thank you.

The CHAIR: Would either of you like to make any opening remarks?

Dr HARRIS: Yes, we do have an opening statement we would like to make before we get to questions and answers, if that is okay.

The CHAIR: Please proceed.

Dr HARRIS: Thank you for the invitation to appear before the Committee and provide further information on our work and capabilities relating to sustainable energy resources, technologies and systems. As Australia's national science agency, CSIRO is well positioned to support Australian governments and industry in facilitating Australia's energy transition towards net zero emissions. CSIRO operates, as you know, under the Science and Industry Research Act 1949, and does not comment on government policy past, present, or future. We do, however, provide rigorous and impartial scientific advice and technological research that helps address pressing and complex issues.

The transition of Australia's energy, industrial, manufacturing, agricultural, and transport sectors to a low-emissions energy future is a good example of such a challenge. CSIRO has access to a wide range of multidisciplinary capabilities and skills to play a leading role in the assessment, development, and demonstration of priority low-emissions technologies, and to help industry meet its needs associated with achieving significantly lower emissions across key sectors of the economy. CSIRO energy research priorities include five main areas. The first of these is electricity transmission. Here, we are building scenario modelling, systems simulation, and real-time estimation tools to improve capacity and inform developments in next-generation electricity networks. We are also developing renewable power generation technology systems and integrated energy storage solutions, to secure flexible electricity supply for industrial, transport, and community sectors.

The second area is industry and transport transition. Here we are developing technologies and solutions to enable decarbonisation of these sectors through electrification and integration of renewable energy resources at scale. This includes development of advanced low-emissions energy storage, distribution, and utilisation applications, such as those that are possible through the use of hydrogen and its carriers as a low-emissions energy pathway. For example, CSIRO is developing technologies to support development of hydrogen production, storage, transport, export, and utilisation for applications across the power, industrial, manufacturing, transport, mining, and agricultural sectors. I would be happy to expand on this area as required during our discussion today.

The third area is carbon capture utilisation and storage. We are working on key technologies to reduce emissions and create value by supporting the transition of carbon-intensive industries and processes through demonstration and commercialisation of carbon capture technologies, as well as utilisation of sequestration of CO2. The fourth area is concentrating solar thermal technologies. We are working with Australian and international partners to develop pathways to integrate solar thermal energy collection, storage, and utilisation at

scale in a range of applications, including power generation, manufacturing, and process industries, where process heat is a key energy requirement. The final area is natural gas. We are working with industry to support improving natural gas productivity, reducing emissions, and securing natural gas supply as a key element in emissions reduction strategies at scale. My colleague, Dr Barrett, can expand on this area as needed in our discussion today.

We see CSIRO as an important bridge, connecting industry with the research community, to develop trusted expert advice, enabling science and technology innovation and prototyping projects - supporting co-development of new technologies, together with industry partners. Collaborative approaches such as this are essential to address the challenges of transitioning technologies, infrastructure, and systems towards large-scale integration of renewable and low-emissions energy pathways at a state, national, and global scale. We are happy to answer the Committee's questions, and will respond to the best of our knowledge. Given the broad range of CSIRO's expertise and activities, we may not be across some of the details on all topics and hence may need to take some questions on notice so we can consult with our colleagues. As stated in the introductions, I am the Research Director for Energy Technologies with CSIRO Energy's business unit; my colleague here today is Dr Damian Barrett, who is the Research Director of the Energy Resources Program, also within the CSIRO Energy business unit. Dr Barrett has relevant special expertise related to the natural gas industry and related technologies. We would be very happy to address any questions you may have. Thank you again for the opportunity to be here today.

The CHAIR: Thank you very much. We appreciate those opening remarks. Because of the technology the Committee is dealing with today, if it would be possible for you to send a copy of the opening remarks through, for the purposes of Hansard, that would be greatly appreciated. Should there be a connection issue, I may at times ask that you repeat an answer; so far, the connection seems to be really good.

Today we have a strong focus on the Hunter region; if we could begin our questioning there, particularly in relation to grid connections in the Hunter and what needs to be done to allow newer energy sources to use the grid infrastructure - what improvements are there and how technology is improving, as well as the wider question about what needs to happen with transmission infrastructure in New South Wales, to help increase and encourage the reliability of renewables.

Dr HARRIS: That is a very big question: What needs to happen to the electricity sector to accommodate a greater uptake of renewable energy? There is a lot of work around that, both from the commercial and market side, as well as the technology side. CSIRO has projects which impinge on both. As I mentioned, the modelling work, the grid simulation work is very much aligned with that, to understand the systems and system needs, so that we can integrate greater levels of renewable energy into those grids. That involves multiplying the grids, in some cases, and also obviously energy storage, which is key in managing the variations of supply. We do have research in all of those areas. I mentioned a couple of means of doing that. Some is through battery integration and solar and wind—the sort of more traditional [inaudible]. There is also work on chemical storage of energy, as I mentioned, through pathways such as hydrogen.

And I mentioned somewhat newer technology, solar thermal technology, how do we make the most of some of the resources that we have now—not all of those are amenable in all places and directly amenable in all sub-grids, if you like. I am not going to speculate on just which ones would be the best for the Hunter region specifically. But it is that mix of technologies, and the ability to harness the renewables at scale - which is really important - and to be able to manage the variations of supply, that is the focus of much of the technology work. And then the grids analysis work is how to be able to manage reliable distribution of that energy in a market system where, in many cases, security of supply and stability of supply is key.

The reason I mention solar thermal is it does have the opportunity, because it is a heat-based system, to provide some degree of large-scale storage with frequency stabilisation, which is part of the issue that needs to be addressed. The answer, I guess, to that question is, there are many contributions, and the system is a heterogeneous system absolutely reliant on storage, security, and stability of supply.

The CHAIR: Dr Barrett, do you want to add anything to that?

Dr BARRETT: No.

The CHAIR: In terms of the reliability of renewables as an energy source, the Committee has obviously heard there has been a strong traditional focus on coal and gas as reliable energy sources, and the ability to power up as needed, with questions about renewables there. How is that changing? Do you find that renewables are becoming a more reliable energy source? Going back to my previous question, are we also seeing the advances in the transmission infrastructure to facilitate that?

Dr HARRIS: I will start, if you like. The big difference or the big challenge, I guess, in getting more renewables in is, as I mentioned, at scale and continuous supply. This transition is not an overnight transition. The

renewable integration is built on top of the systems that we have, so we do not end up with a discontinuity. We have to work with industry to build from where we are to where we need to go. The established fossil fuel energy—I am talking about the electricity [inaudible] the established cost of fuel and electricity systems—are important, to stabilise that system as we transition and add more renewables. Gas has a particular role to play as do our established coal based technologies.

As we move to ultimately renewable systems, the challenge is that we are addressing the emissions. The outcome that we need to address is to reduce emissions overall. So some of the developments that I mentioned are actually addressing emissions in this transition period, from those industries that are still reliant on carbon intensive systems. That is why we are looking at things like carbon capture and storage, and why we are looking at, for example, integration with INS Technologies, is another renewable. So many of those thermal and thermal-chemical approaches have the opportunity to increase in scale, but we need to stand on the shoulders, if you like, of the fossil fuel industry that has provided the scale to date.

The CHAIR: Obviously the CSIRO has many industry partners as well. In terms of workforce planning in the transition that is happening in the energy market, do you have any comments on any gaps or work that has been done in that space?

Dr HARRIS: I do not, personally, from the work in the CSIRO. We are working with our industry partners to understand how some of these new technology opportunities can integrate into their business, either in an associated site, or on top of their existing technologies, and in many cases those skills and capabilities are transferable. Many of the thermo-chemical processes, of course, even have very similar chemical processes. So we can see a strong transition opportunity to be basing these transitions on the knowledge of the industry that exists, and we have partnerships on this sort of technology with suppliers. Those partnerships, with the energy generators, and the modelling work with the network grid systems, are all an important part of that. I am not directly doing work on the workforce side of things, but our industry partners are clearly aware that that is a key factor.

The CHAIR: Dr Barrett, do you want to add anything in that space?

Dr BARRETT: I guess the comment I would make is that significant development of energy resources, be they renewable or otherwise, of scale, particularly in regional areas, can have significant effects on demography, income, and jobs. We have seen this in CSIRO research associated with gas development in the Surat Basin. We have quantified, for example, in Queensland, the growth of the industry there, of the moving of young people between 19 and 26-years-old, migration into the area, and its impact on family and household income.

In New South Wales, our research shows that those regions where we have seen gas development, on average there is 7 per cent increase in family income in regional areas, compared to similar regions where development is not happening, despite the fact that development in New South Wales is an order of magnitude of approximately less than the scale of the development in Queensland. So that gives some broad numbers on potential impacts of regional development at scale, in relation to energy supply.

Mr NATHANIEL SMITH: This Committee has held hearings some weeks ago when it heard from many stakeholders. One stakeholder - I think it was the general manager of Singleton Council - talked about the amount of employment in his region, of 3,000 to 4,000 jobs from the mining industry, especially in thermal coal. What sort of potential career pathway do you see for those miners in the Hunter region, moving forward, if the transition were to happen a lot faster?

Dr HARRIS: I do not have a comprehensive answer to that, but obviously the Hunter coal market is made up of both domestic utilisation of coal, and a very large proportion of export coal. I would expect that the export marketing of coal is also going to continue at some scale, for some time, as there are many countries reliant on that. I would see that that will be there for some time. That said, many of the engineering skills and technological jobs in that sector are also amenable in the renewable energy sector. To add to Damien's comments, we have seen in regional areas where there are now many large solar and wind projects, for example, a strong growth in job opportunities in those regional areas. These are often different areas when there may be coal or gas but for these installations and operations of renewable based technologies.

Likewise, in the chemical sector - in which Newcastle and the Hunter regions have a very strong base - the work that we are doing, around the hydrogen value chain, and hydrogen as an energy carrier for the export market, will also require large-scale chemical process engineering, as part of the hydrogen reduction and storage, and transport use. These are still energy resource type jobs, and strongly linked to both domestic and export markets. We see strong growth in that whole value chain, even if it is not to the same extent of direct coal mining, or direct use in the existing technologies portfolio.

Mr NATHANIEL SMITH: My concern comes back to jobs. The one thing that we have learnt from COVID-19 is that you need jobs, you need shelter, you need water and you need food, and that is something that we always have to keep at the front of our mind with the transition to renewable energy. We need to make sure that people can put food on the table for their families.

Dr HARRIS: Absolutely. That is an important imperative behind the work that we are looking at. We do have an opportunity here to create a global scale energy market for our renewable industry, for use domestically, and for export, through carriers like hydrogen and other chemical feedstocks and fuel replacements. There are opportunities there. Obviously a transition, but built very much on the nature of many of the industries that already exist.

Mr JAMES GRIFFIN: Following on from your comments. We heard a couple of weeks ago about the opportunity to reimagine some of our legacy manufacturing industries, and how, potentially, hydrogen might power those heavy industries, particularly in the Hunter region. That could create an exciting future for those regions. You mentioned before about the opportunities in the global market and the scale from a domestic point of view. Does that thinking align with the research and the work that you have done? Do you see an opportunity for us to power industry through the use of renewables, whether it be solar or a mix, for a new life for the Hunter?

Dr HARRIS: Very much so. Many of the industry partners we are working with are looking very closely at the emerging quantification of their existing technology base and evolution transition pathways for those industries. The ammonia industry is a good example in the Hunter region. That industry has been, predictably, focused on explosives and fertilisers. We now have an opportunity in that sector to increase the market significantly into high-value transportation energy opportunities, as well as to provide a decarbonisation pathway for the conventional industry, for the explosives and fertiliser path, for example. That is a whole new market on a global scale, for an industry that has, today, focused on a relatively narrow but very important market, and opportunity is there for them to broaden their feedstock base, to include other inputs, such as industrial municipal waste, sewerage, and sludge.

All those types of hydrocarbon feedstocks do have a pathway into those sort of chemical hydrogen based renewable technologies. Along with the ones we talk about all the time, solar and wind and—not so much for the Hunter—hydropower. There are very strong opportunities for those to take on bigger and broader markets, and to diversify significantly their feedstocks, to transition to an ultimately renewable value chain.

The CHAIR: Dr Barrett, in a previous answer there was a disconnect with the sound. You were talking about a 7 per cent increase in household income as a result of a transition that had occurred. Could you repeat that answer?

Dr BARRETT: Yes. I was referring to some research we have done in the CSIRO, on the impact on income within regional areas of New South Wales, looking at comparable locations where agricultural and gas activity has occurred. And in those regions where gas activity has occurred, we estimated that around about a 7 per cent increase in family income can be assigned to the activity of the gas industry operations in those regions. That is a comparison in Queensland in the Surat Basin; the impact on median family income was about 12 per cent.

The CHAIR: Thank you for that clarification and for appearing before the Committee. We may send you some further questions in writing and your replies will form part of your evidence and may be made public. Would you be happy to provide a written reply to any further questions we may ask?

Dr HARRIS: Yes, of course.

Dr BARRETT: Yes.

(The witnesses withdrew.)

JOE JAMES, CEO, Hunter Joint Organisation of Councils, sworn and examined

BOB PYNSENT, Chair, Mayor of Cessnock, Hunter Joint Organisation of Councils, before the Committee via videoconference, sworn and examined

SUE MOORE, The chair of Economic Transition Subcommittee, Mayor of Singleton, Hunter Joint Organisation of Councils, before the Committee via videoconference, sworn and examined

The CHAIR: Does anyone have any questions about the hearing process?

Mr JAMES: No.

The CHAIR: Would any of you like to begin with an opening statement?

Mr PYNSENT: Yes, I will start. As the chair of the Hunter Joint Organisation [HJO] we welcome the opportunity to make a submission to the parliamentary Committee on Environment and Planning. The HJO represents councils of the Greater Hunter. The Hunter is the largest regional economy in Australia, with a greater economic output than Tasmania, the Northern Territory, and the Australian Capital Territory. It drives approximately 28 per cent of regional New South Wales' total economic output. It is the largest regional contributor to the state's gross domestic product. The Hunter is home to more than 860,000 people, making it the most populous regional area in Australia. It has an estimated workforce of over 373,000 people. The projected population in the Hunter is estimated to be 1.1 million by 2036.

The prevailing energy ecosystem in the Hunter is dominated by thermal coal mining, for export and thermal coal power generation. All our thermal coal fired power stations that account for 25 per cent of the national energy market. The Hunter's power generation industry produces over 60 per cent of the New South Wales electricity grid supply, and employs approximately 2,200 people, and contributes up to 14,000 indirect jobs. There are 21 coal mining operations that account for 11 per cent of globally traded thermal coal. The Port of Newcastle is the largest coal export port in the world. The mining of thermal coal continues to be a significant component of the Hunter's economy, with over $19.4 billion in coal exported through the Port of Newcastle.

The coal sector in the Hunter is estimated to provide direct employment for up to 11,000 people, and contributes to up to 40,000 indirect jobs. The Hunter Joint Organisation, originally Hunter Councils, was created as a collaborative association of the region's councils. The Hunter JO is a statutory body corporate, constituted pursuant to section 400Q of the Local Government Act 1993, with a function, amongst other things, of establishing strategic regional priorities for the Hunter. The vision of the Hunter JO indicated a changing landscape in the energy market over the next 10 to 20 years. The Hunter JO has established a Hunter Economic Transition Standing Committee with representatives from all member councils. The Transition Standing Committee supports the Hunter JO in giving strategic focus to the issue of economic transition in the Hunter. I would now like to introduce Singleton's mayor, Councillor Sue Moore, as the chair of the 2050 Foundation.

Ms MOORE: Good morning, and thank you for the opportunity to speak today. As Mr Pynsent has introduced me, my name is Sue Moore and I am in my ninth year as mayor of Singleton. I have been on council since 1999, and lived in the Singleton area all my life, so I consider I know the Hunter area very well. I speak you today as a member of the Joint Organisation of Councils, and chair of the Hunter 2050 Foundation committee. Our General Manager, Jason Linnane, spoke on 26 August, more specifically related to our local government area [LGA]. I can answer questions related to Singleton. However, as Mr Pynsent said, our role here today is as part of the Hunter region, through the Joint Organisation of Councils. Mr Pynsent has referred to the significance of power stations and coal mines in the Hunter, so I will not go over that again, although I am very pleased to answer any questions in relation to that.

I will leave any further details to Joe James, the CEO of our Hunter Joint Organisation of Councils. However, I would just like to conclude in saying that it is very clear that the Hunter is the powerhouse of this state and, with the right resourcing, it could be the powerhouse of the future, in a very different way - but we must start now. Thank you for the opportunity.

Mr JAMES: I would also like to thank the Committee for the opportunity for the Joint Organisation to make a submission to attend the hearing. I have a few opening remarks. I am going to focus on the terms of reference that relate to the effects on regional communities, and also on the work that the Hunter Joint Organisation has done over the last 12 months - on one of our initiatives being a foundation to lead a regional response to economic resilience. I particularly want to touch on the importance of local leadership in determining the future of the Hunter, our proposal for regional leadership around the Hunter 2050 Foundation, and the critical importance of collaboration with other levels of government, particularly the state government.

In the face of economic change in energy markets, local leadership is essential for sustainable outcomes for our communities. Neither the state nor the Hunter region controls global markets for energy technologies or thermal coal, on which our economy is highly dependent. Mr Pynsent has already touched on the fact that tens of thousands of jobs, and the industrial base of the region, are at risk in coming decades, so it is imperative that the region and the state respond strategically and proactively, before any acceleration in downsizing traditional industries.

We have looked at examples around the world, of regions responding to economic change, and reviewed the current research in the sector. We have done a study tour of the Latrobe Valley. The conclusions were fairly clear: The best results occur where local leadership is instrumental in solutions, invariably some balance of local political, industry, and institutional leaders. Local leadership brings local knowledge, a network of local actors, and vested interest in the success of their communities to the challenges at hand. The JO, through almost 10 months of detailed stakeholder engagement, has received widespread regional support to lead a response to this challenge. The supports come from a diverse group, not limited to: AGL, the University of Newcastle, Bengalla Mining Company, Malabar Coal, RDA Hunter, the Committee for the Hunter, Hunter Renewal, and the Commonwealth Employment Facilitator for the Hunter Valley. Each stakeholder has emphasised the importance of local leadership at the regional level by the Hunter JO to create a clear pathway forward in the region, a cogent and well-designed solution, and successfully bringing disparate and potentially divided groups into coalition.

Our proposed solution is the Hunter 2050 Foundation, which is a vehicle to address the things that we can influence, to futureproof our economy and our community, regardless of the changes that might occur. The foundation's proposed focus is securing new investment into the region and supporting local jobs. It is an independent entity intended to be founded by local leadership with the collaborative support of all levels of government. It is led by a skills-based board that has three distinct roles: support new industries and business opportunities, through local investment funds and programs that support existing businesses to plan and expand their future horizons; secondly, to help locals secure meaningful employment opportunities, especially those from the mining and energy sectors, through creation of regional scale sustainable workforce supporting capability; and finally, we want to work with the mining and energy and broader industrial sectors on the regeneration, reuse, and repurposing of their sites into new industries. All of the above would be evidence and data driven, underpinned by our work with our key research partner, the University of Newcastle.

Once established, the intended foundation is to work for the benefit of the local community. Its success would be measured by the benefits that flow from the new projects, new businesses, and new jobs that it helps create locally. The principles that underpin this concept are not new. The idea of social impact investment, investing for both a commercial return, but also targeting and measuring social impact, is used globally by superannuation funds and governments. There are also excellent examples of effective business and workplace support programs across Australia, even in the Hunter. What the Hunter 2050 Foundation does is bring those usually disparate activities together in one place, and create a focused, regionally led, and enduring capability within the Hunter. If we start now and get this right, we can secure billions of dollars of investment for the region, and secure new opportunities for our local businesses and workforce.

Of course, the region cannot do it alone. It needs the collaboration of other levels of government. We know this because our research told us this was a key ingredient to success. We also know it because it is common sense. It is the other levels of government that often control critical policy levers around regional development, energy sector regulation, land use, and planning. It is also the other levels of government that have investment portfolios of a scale and flexibility that local government does not. This is not about asking for a handout, though. Local government and local industry have already stepped up, and are looking to make commitments to support the foundation. We are looking for the state and federal governments to match those commitments. In total, we are looking at about $15 million, over three years, to get the foundation up and running.

We need capital from governments and private sources to be committed to enabling the growth of new and existing opportunities, so this is additional capital which governments and private investors would expect to return. So, with the support of state government, the Foundation would be self-sustaining and, in time, would become a significant source of investment support for local industry, local workforce, and the community. It is also pertinent to ask though, if local and state government do not collaborate on a solution, then what is the alternative? Does state government policy proceed, agnostic to the impact on the region that has been the backbone of the energy and resource sectors? And is local leadership just a stakeholder in the implementation of state-led solutions, or does local leadership share a role in co-design?

The Hunter Joint Organisation of Councils as a collaborative path is clearly in the best interests of both the region and the state. I would like to thank the Committee again for the invitation to appear today. It provides a really important opportunity for the JO to fulfil its role of local leadership. We commend our proposal for the regional leadership to the Committee in the form of the Hunter 2050 Foundation, and we restate the critical

importance of collaboration with state government in achieving optimal outcomes for the communities of the Hunter.

The CHAIR: Thank you. At the outset I commend the JO for its work; stepping up to quite a complex challenge at the local level of government. I thank you for the time spent on this and your commitment to it. If we start by looking at the proposal for the 2050 Foundation, in comparison to the Latrobe Valley Transition Authority, what were the learnings from your time analysing that, in terms of the gaps in areas; and how did that inform your development of the 2050 Foundation?

Mr JAMES: I am happy to answer that, but Councillor Moore was also on the study tour with me, so she may also have some perspectives. I think they informed us as to timing of intervention and as to leadership. So, critically, I think, there were lots of signals in the Latrobe Valley, going back to the time of privatisation of the power plants and from that time forward—they lost quite a few jobs, but there was no loss of productivity out of the power plants—there was a red flag for the region, to say they are highly dependent on this industry. There was a decade worth of plans about intervention, but no actual action until Hazelwood shut.

While we note favourably in the submission the size and scale of the investment from the state government—I think it was in the order of $250 million and, I think, additional amounts beside that—it was very late, and they are still working through where those new economic green shoots are going to come. I think the other part was around leadership, from my perspective. It was a state-based intervention and it is a state-based authority, and when we went down there it was clear that while, once on the ground, they had started to try to build collaborative arrangements with local government and with unions, it had not started from that point. It is a state authority and that sends a message to a local community because it says, "The state knows best," rather than it being a co-designed solution.

The CHAIR: Councillor Moore?

Ms MOORE: Everything that Mr James has indicated. I guess the only thing I would add would be to reinforce the collaboration aspect, particularly with the grassroots at the initial start, rather than what happened there, which was top-heavy down telling what was going to happen, or not taking people on board, and the leadership on board needed to develop it—pretty much everything that Mr James has indicated but partnership is hugely important.

The CHAIR: If we have a look at the Hunter region, obviously you are all leading a community-led approach to this, but where are the gaps in support from the state government that you are looking to fill?

Mr JAMES: Again, I will start, and ask councillors to contribute. I think, most critically, from our engagement within the region, we saw a big gap in active investment; and we saw that when we talked to both international businesses - so, mining companies that have international parents - and in small startups, there is a competitive disadvantage being in regional Australia in accessing capital. And so what the state does, and what local governments do, is investment attraction. We do not want to repeat that in the Foundation. We are looking to build an actual investment capability, through the concept of social impact investing.

Then the other gap was that there are some excellent programs: internationally, in Australia, and even in the Hunter, that support workforce, that support businesses that want to diversify. Even some of our own local government areas run some really excellent programs. I can think of one in Singleton that is starting up, and one in Newcastle that I have run my eye over. The challenge is that those things tend to be programmatic and once-off. They do not build enduring capability, and the task of economic diversification is measured in decades, not weeks or months. That is something that the Foundation is looking to address.

The CHAIR: Councillor Moore, would you like to add anything to that?

Ms MOORE: Not at this point, unless you have any questions.

The CHAIR: The Committee's terms of reference were adjusted to look at the economic recovery as a result of the COVID-19 pandemic. In terms of the urgency for state government investment and support, could you talk to the question of urgency, but also to the question of wider benefit for economic recovery from the recession that we all are experiencing now?

Mr JAMES: Yes, sure. Interestingly, when we first started this, it was pre-COVID, when we first were working on this concept, and once COVID hit, what became apparent to us was that the programmatic work—initially, the business diversification, business planning, product development support for businesses, and then the workforce support programs—was going to be more critical, because the pandemic has brought those issues to the fore, unrelated to the broader risk that the region still has in its dependence on a couple of key commodities. That, as I imagine for most of regional Australia, is quite urgent, particularly in the tourism industry being heavily impacted. That changed the way we designed the organisation. Rather than wait for investment returns to help

fund some of those programs, we wanted to forward-fund some of those programs and, essentially, our funding model changed to reflect that. So, we wanted a few million dollars up-front to be going directly into those sorts of programs, and starting to build that capability from day one.

The CHAIR: Thank you. Any other comments, councillors?

Ms MOORE: No, not from me.

The CHAIR: In terms of the work that you are doing, obviously the Hunter is the region where we talk about the transition of energy supply, which is at the forefront of people's minds, but do you feel that you are establishing an appropriate model that could be used in other areas that could be experiencing a similar transition?

Mr JAMES: I think, yes. If our submission is any guide, when we first started this, and noting the time between our submission and now, and what has changed, including our own research, we envisaged almost a model that could be—I think we referred to it almost as an Australian transitions corporation. We actually think the model of place-based investment-led solution is something that is conceptually applicable to anywhere, making sure you understand the comparative and competitive advantages of those places, and the real starting point for each of those places.

In one sense, there is no reason, with the right policies and the right investment, that the Hunter should ultimately go backwards. It is already a substantially diversified economy, more so than some other regions, but it does have this really significant dependence on one or two key commodities. But it is well-placed, with the right investment, not just to mitigate a risk to the state, but to actually become and continue to be the asset to the state that it has always been. Whether it is in the energy sector, or in new industries, it has some key assets that enable it to contribute and, in one sense, out-contribute or outperform, for its relative size and scale, its contribution to the state.

Mr JAMES GRIFFIN: I commend the Hunter JO for the work it has done. We have heard from a diverse range of peak bodies and groups throughout this inquiry. You will be heartened to hear that there is almost unanimous consensus around many of the things you have spoken about, and a real desire to see the Hunter succeed in the future. A lot of what you have said goes to the heart of comments we have heard from many in the inquiry. Mr Pynsent, you mentioned in your opening remarks that coal is the direct employment for about 11,000 people. My question and concern is, do you feel that the plans or the future or the vision for the Hunter region—in whatever form that takes—will fill the gap between the current employment level and what we are looking at into the future, with the varied energy mix and the reuse and repurposing of manufacturing and heavy industry up there? Do you still think we will arrive at a deficit between the amount of people employed today in coal and the potential and the possible employment opportunities in the future?

Mr PYNSENT: I am fairly confident, because this plan is something that is driven by the community. We have so many resources. We have trained workers to diversify into other industries right across the Hunter. The concentration of power stations and mining is probably more in the upper Hunter than the rest of the JO area, but there are opportunities for the development of industrial lands right across the 10 local government areas. So I am confident that there will not be a deficit.

Mr JAMES GRIFFIN: That is great. Councillor Moore, I think you mentioned the matter of timing, in the context of the Latrobe Valley experience, and that perhaps there were signals there early on that ultimately they missed, and it led to a lag, in terms of what they were able to do and how quickly they were able to respond. I sensed in hearing the submissions and comments from other members in the inquiry that there is a real body of work and movement and energy being put into trying to solve this issue. Do you feel that is the case, or is there too much conceptual talk and not enough on the ground planning and work being done?

Ms MOORE: Travelling down to Latrobe was a great experience, and helped me understand what they have been through, but they are totally different to the Hunter. The Hunter is a whole different demographic and we always will be. Having said that, we are in a position where we can plan now. Having looked at what has happened there, and what is still happening there, we are in a better position to be able to bring about change now. We have got the resources, and we have got industry on board. Industry is looking for a vehicle to deliver the outcomes we have spoken about. I think we are very much in the right position, and heading in the right direction. We are basically ready to go, with everyone looking for someone to drive this thing. We see that the Hunter JO is the right vehicle to drive this. Does that answer your question or have I gone off track?

Mr JAMES GRIFFIN: No, that answers it very well, I think. What you are saying is that there is not a delay in action and thinking that might have been the case in other areas around Australia, and that everybody is very alive to what is happening. There has been a shift in thinking over the past decade or so, around whether this transition and these changes impact us now. It is happening, and we need to do something about it. That is good to know, and it does seem like the Hunter JO is doing a terrific job. Thank you for those comments.

The CHAIR: Thank you, Mr Griffin. Any questions from Mr Smith?

Mr NATHANIEL SMITH: Thank you for coming along and congratulations on setting up your JO. My area in the Southern Highlands is very similar to the Hunter. Obviously we have a coal industry in the Wollondilly area—metallurgical coal or thermal coal. We have got our equine, we have got vineyards, agritourism, and things like that. They are an important part, and all those industries keep the regions going. Councillor Moore mentioned earlier that there would not be a deficit in new jobs. My main concern is coming out of COVID-19, having a job and a house over your head, having water and reliable energy is going to be critical going forward. COVID-19 has taught us that in the last six months. There were literally thousands of jobs in the coal industry, and people who work down the pit get paid a good wage. With these new jobs that may come online with renewables, do you see similar pay going to those individuals or will it be less? Have you looked into those areas?

Mr JAMES: Yes, we have done some work. We are actually working with the state government at the moment on a piece of work specifically focused on the upper Hunter region. We are trying to understand the practical process by which new industries emerge, and workforce changes occur. The typical experience overseas, is that jobs are not always like for like in all facets. So that is obviously a key consideration, but the principle behind this is that it is driven by market forces that bring new investment and new roles. People usually want a job rather than not having a job.

Mr NATHANIEL SMITH: Okay. In your submission you talk about unlocking the potential behind buffer land and rehabilitation sites. Can you elaborate on this and what changes would be needed in the planning system to allow this?

Mr JAMES: There has been some work done with the state at the local level—so, the Hunter and Central Coast Development Corporation, and the Regional New South Wales team—around buffer lands. It is essentially a system change, that would allow some form of revision to exist in planning consents that were put in place, where there was not an anticipation of a redeployment of the use. The system, at the moment, does not easily allow for that. In opening up a variation to an existing consent, it exposes existing landowners, or existing operators, to changing standards. While they are compelled, as asset owners, to try and maximise their assets, they are often wary of the risks involved, whereas the community itself has an underlying interest in making sure that asset gets redeployed. That is part of the focus of the 2050 Foundation, to work with regulators and landowners to unlock those opportunities.

There are good case by case examples. In Lake Macquarie, there was also the old Pasminco site that has been released, and we know that there are other individual operators who are working with state government and, in some instances, with local government, to unlock the potential of their sites. The more fundamental point is that a change in systems thinking would mean that this does not just happen on just a project by project site, where you get things like the Metropolitan Creek—where you are making old industrial sites more valuable for residential redevelopment. We need to do this for industrial redeployment. That requires a systems-level intervention. There is work happening within state government on that. The Foundation just wants to put a really pointed focus on that work.

Mr NATHANIEL SMITH: Thank you.

The CHAIR: If I could go back to a previous question I asked, we are obviously seeing lots of decisions made by state government to fast-track investment, to help with economic recovery as a result of the COVID-19 pandemic. To make the 2050 Foundation a reality—to start achieving its goals for your region—what do you need from the state government?

Mr JAMES: Two things: a $5 million seed investment, and then a willingness to look at actual investment. The state and federal governments invest—they have investment portfolios. When you create a fund of any description, having a cornerstone investor in the fund—much less a government as a cornerstone investor—makes it a very attractive proposition, and accelerates the development of that fund. The seed capital is $5 million over the course of three years, matched by $5 million from the region, hopefully matched by $5 million from the Commonwealth. It is a tiny investment.

To come back to Mayor Pynsent's comments earlier, around that confidence, I think the confidence comes from seeing the opportunities that exist in the Hunter, by getting this capability up and running and attracting the funding in, trusting that the inherent competitive advantages and comparative advantages are there. There is already a very big innovation ecosystem; it is about unlocking it within time, to allow those green shoots to emerge into new industries. The majority of them will invariably start from the sorts of things that we already do, just starting to get more—all industries get more and more developed and specialised. It may be increasing forms of

different equine industry; it may be around certain types of value-adding to the food supply chain. But that is where the confidence comes from.

The criticality of the collaboration of the state there cannot be undersold, because invariably when we talk to the Commonwealth it is always interested in what the state thinks, given that we are in the state of New South Wales. I should say that this is not the first discussion—we are talking about it publicly today, but we have had some very positive discussions with the Deputy Premier's office, which has looked at this concept and asked us, and we now have put our ask in writing, and it is looking at it. At a conceptual level he has been very supportive of the fact that the JO identified this as a key strategic issue and came up with a regionally led solution.

The CHAIR: That seed investment or funding would allow you to really supercharge the work you are now wanting to do within the Hunter region?

Mr JAMES: Absolutely. It would allow us to effectively create a specialist team to run the investments and drive the programs that we see are intimately linked, and allow us to feed research in to make sure that it is all evidence-driven.

The CHAIR: Following on from Mr Smith's question—it is probably a question for Councillor Moore or Councillor Pynsent—in terms of the feeling on the ground in your communities in the Hunter, with what is changing within the energy supply, the potential risks for communities and workforces in the Hunter, and what we are now dealing with during the COVID pandemic, how are your communities, and what is their response to the situation there? What do they want?

Ms MOORE: I guess our community's probably no different than any other community. They are nervous with COVID, and where the jobs will be. We have got a number of coal mines that have actually shut down for holidays or long service leave. All of that probably is more market-related than actually COVID related, but it still comes back to the same impact on mindset in communities. Our community is very much for positive thinking. Moving forward, our community would be embracing any level of—whether you use the words "diversification" or "transition", it still means the same thing. The communities are ready and waiting, as far as I can see, for the leadership to redirect them towards those opportunities.

The CHAIR: Councillor Pynsent?

Mr PYNSENT: I agree with Councillor Moore. Our LGA adjoins Singleton. We do not have the direct mining here, but we have probably 10 per cent of our workforce leave our local government area to work in the mines. There is a degree of confidence, and I think the confidence revolves around the opportunities that people see in our local government area, and wider across the Hunter. We have been going through a bit of a boom recently, particularly with housing, which has been a buffer to any downturn in mining. The relocation of miners back to their trade in the building industry has been quite significant within our local government area. The amount of investors who are willing to give the Cessnock and lower Hunter area a real go—because we are probably 30 per cent to 40 per cent cheaper than doing business in western Sydney. I think that creates so many opportunities for the wider Hunter.

The CHAIR: Thank you. Mr James, do you have anything to add to that?

Mr JAMES: No, thank you.

The CHAIR: I again thank the witnesses for joining the Committee today. We may wish to send you some further questions in writing. Your replies would form part of your evidence and may be made public. Would you be happy to provide a written reply to any further questions?

Mr JAMES: Sure.

The CHAIR: Thank you all for your time.

(The witnesses withdrew.)

(Short adjournment)

ALAN BROADFOOT, Executive Director, Newcastle Institute for Energy and Resources, University of Newcastle, sworn and examined

The CHAIR: The Committee will now hear from the Newcastle Institute for Energy and Resources. Professor Broadfoot, do you have any questions about the hearing process before we begin?

Professor BROADFOOT: No, it is straightforward to me.

The CHAIR: Do you want to make an opening statement?

Professor BROADFOOT: No.

The CHAIR: I will go to the issues that we are discussing. What opportunities do you see for the implementation of emissions reduction technology in the coal mining sector?

Professor BROADFOOT: The coal mining sector is always looking at reducing the cost of energy all along. This myth that they are running diesels at the face like an underground mine; they are actually all electric. Because of the voltage drops across the pit or the underground system, they tend to have to put productivity and efficiency equipment into those systems, to be able to operate at those distances. There are the obvious things, for example, power factor correction, to further reduce the voltage drop and the losses in the lines. Also, there is the debate about alternative fuels for the trucks, say, on an open pit, they are not fuels that we use underground, because of the hazardous environment, but I do believe that they have all been looked at.

The CHAIR: Will you take the Committee through the work that is being done to establish the regional hydrogen task force?

Professor BROADFOOT: Yes, this is a separate conversation. To me, the opportunity for the Hunter is about the skills and the capital equipment that we have embedded into a world-class METS sector, which is the mining equipment, technology and services sector. They are best equipped for what people refer to as the energy transition, and I see as the new energy economy. That is because we have had a very centralised system. It has not looked for innovation in its outcome. Now what it is, you can have more private ownership of electrical infrastructure, and we can be early adopters of the technology.

Hydrogen is of particular interest for the Hunter, first, because we have the port for export. Second, we have the transport networks into the region, and also we have the LNG lines there as well, not to mention the skilled workforce. One thing about the mining industry is it is based on having to deal with methane, but at the same time, it is the same hazardous gas which most of the industry in the Hunter has already certified, which is hydrogen. We also see early adopters of hydrogen, through the diversification of energy use within the sector, like the aluminium smelters, or anything that is transforming steel. So you have got Molycop, you have got Bradkin, you have got the rolling mills still in the region. So it is significant gas intensive industries that could benefit from the use of hydrogen. There is also the issue of gasification of coal. I am not saying I am advocating that, but at the moment, gasification of coal actually has lower emissions than green hydrogen, so there is an opportunity there as well.

Mr JAMES GRIFFIN: Professor, thank you for appearing before the Committee and for your submission today. I note the broad breadth of the industry partners of the institute. Obviously that must provide a lot of input and insight into work. The Committee mentioned hydrogen being in the news quite a lot recently. Do you have any further comments about how the role of hydrogen can accelerate the transition from coal into how we might power the industry in the Hunter or Newcastle areas?

Professor BROADFOOT: There are two answers to that. The first is hydrogen as a substitution for gas in itself as an alternate energy, but there is potential for the use of hydrogen, to burn, to drive a turbine. The biggest challenge we have with the grid construction at the moment is we need a synchronous power supply to energise it, to be able to on-board a lot of the technologies. To drive a turbine is combustion, and that is where we could use hydrogen. Now, hydrogen as a direct competitor at this stage is problematic, but parts of the cycle with solar, for example, you could have energy at an extremely low price. If we can tap into that part of the market, to store that as hydrogen, we could then drive that as a turbine to give stability when we do need to run the solar peak demand.

They are two of the opportunities. Yes, we do a lot of work with industry. We are a state and federal initiative to work with industry. Sixty per cent of our funds come from industry. I always say that research is the first part of the wave. At the moment we have 16 research contracts with industry, looking at the use of hydrogen in their processes. That is the big thing: energy intensity. For example, we have secured a contract with an industry partner through ARENA to look at the creation of pure water through a hydrogen harvester - which is a project

being funded through the New South Wales Office of the Chief Scientist - in conjunction with solar, to convert the water into green hydrogen. But then we are converting it back into green CH4, methane, to put back into the pipeline. That is going to be a demonstration site in Roma. Another example is a client looking at converting diesel into hydrogen on a ship, and then mixing the hydrogen back into diesel, to improve the productivity of the shipping. So the industry is looking and probing, and that is the exciting thing about what we do. We actually see those earlier adopters looking at the alternative use of the fuel.

Mr JAMES GRIFFIN: The Committee just heard from the Hunter Joint Organisation of Councils which was very optimistic about what the landscape of the Hunter looks like from an industry perspective. Do you have a feasibility or engagement with those sorts of organisations in your work?

Professor BROADFOOT: Yes, we host the NSW Energy and Resources Knowledge Hub, which is another network through the Chief Scientist and Engineer's Office. In there, the Joint Organisation of Councils is a member, and so is Engineers Australia, the Business Chamber, HunterNet, RDA Orana, and representatives from the Illawarra. We all come together, and the concept is we are looking at the opportunity between the regions, as the new technologies become available. I think the strategical advantage of knowledge is that it is a competitive advantage of industry, it is about getting the first equipment to market, it is knowing when the market is going to shift, it is engaging with government to understand where the policy direction will go on a collective basis.

Yes, I am still very bullish about the Hunter. I see the Hunter is just going into another phase. We still have world-class equine industry, the wine industry, we are seeing a re-invigoration of agriculture. To me, the challenge is, how do we deal with water security; and opportunity does exist, with the release of the licence of the power station. It is about, how do we access and re-visit the early adaption of buffer zones? I mean in the olden days, there was so much land there, it was easy to put 10,000 acres around a power station, but can we get that early release? The big thing also is land use. One thing with mines, especially open-cuts, they will form voids. If you look at what they have done in Czech Republic, they have positioned their voids to actually capture water, and use that to help future-proof regions. They have done a significantly world-class job there.

It is also coming back to the new energy economy. We still have the infrastructure there, in terms of the grid, to attract energy intensive industries to the region. We have got the skills to support them. There is one thing about new technologies, if you have got a technology just invested, say, an aluminium smelter or an ammonia plant, you have usually got to allow your capital projects to run for about 15 to 20 years to get your money back. So, you have to get the right timing to apply the new technology. New industries can be those earlier adopters, but we have also got industry that is now going through that review about future investment. Energy security and skills security is a critical part of that. For example, if we were to look at battery manufacturing in Australia, it is easy to buy the technology offshore, it is a different thing to train the workforce to operate it. I still think that the Hunter has that capacity to support that technology in region.

The CHAIR: Just following on from that point, Professor. In terms of unlocking that capacity, what do you see as critical next steps and support required from government?

Professor BROADFOOT: The price signals are there, that we have to look at alternatives. The biggest thing is that, when they put the power stations in, back in the sixties, there were big generators and very concentrated loads and then we had two aluminium smelters that were 25 per cent of the load. It was an easy mathematical problem to manage. We have to restructure our grid for a more important reason than just simply low emissions. Low emissions are important. It is because the load distribution has shifted, relative to the generators. At the moment I would estimate that 10 per cent of our energy is being lost in transmission. We need to move, by necessity, a generation back towards the load to reduce those losses.

If you are moving to a distributed generation, that is the solution. The issue is that we have privatised the grid. We need to now start looking at what is the new model to allow that transformation to take place. I think by necessity, for example, you could have two industries drawing close to 50 MVA load together. You could put a solar farm in there, 50 MVA beside them, to actually run a minor network, and then probably still have enough spare capacity built to support industries in the region. For example, there used to be a power station at Cockle Creek in Newcastle. It used to run its transmission wires all the way up to Kurri and Cessnock, and part of the deal for the license from the state was they had to supply electricity to the hospitals.

In some ways, we are moving back towards that model. However, we cannot go back to simply a distributed grid—a term I have coined called a collaborative grid—we still need the backup and strength of all the grids connected, but it has greater autonomy to run day by day, with an integrated energy infrastructure in a localised area. I am a power engineer by background. It is hard, it is complicated, and there are a lot of cost curves involved when we try to run one integrated grid. For example, if we were to break it into a region, it is a different model. We can break the barriers on the amount of renewables we can bring in, we can improve the modelling,

and increase stability. If you do not, if you have the scenario moving from one generator, where the connection is fairly simple, to 100 generators, it is going to be complicated.

So you will find that your cost pressure will move, and the cost of generation will be irrelevant - the cost of the infrastructure will be the determinant point. We have to be able to capture that, so that it is more economically feasible. I suggest on the electricity bill at the moment, the infrastructure cost is already far exceeding the generation cost. They are the things we need to look at. They are the challenges. When I went to uni, power engineering was key, now it is an elective, and that is because of the loss of innovation. We are moving into a skills shortage. At the moment, universities are only training one in three engineers this country needs. With COVID, we have the other two still missing.

We need to lead by transforming the priorities for education, to be able to support this new energy economy, as they refer to it. This has happened before. I was the first electrical cadet for the Electricity Commission for the mining industry, because there was none. That was paid for by the state. That was an intervention. The other thing is, I question how many TAFEs run gas fitting or gas pressure welding as a course elective, because of the low demand. If we are going to transform to hydrogen or any natural gas, the increased use of it, we will have a skills shortage. The market got confused: what is the difference between an electrician and an electrical fitter? An electrician wires houses, and electrical fitters work on electrical substations. We have to reskill. We need to make sure that we do not create dead ends.

There is one thing about having one regulator: you had one set of rules and everyone had to conform. It might suppress innovation, but we had compliance, and adaption of new technologies. We have to be careful that we do not create a dead end, by not having the relevant standards to make sure that industry has free access to these new networks. We saw that with the pilot for the city Smart Grid in Newcastle. They picked a mesh communication network for the smart meters, and it was out of date by the time they finished the project. There is criticality there. The other aspect is, I always believe, that market will drive it in the end, that means it will become cost-effective. The thing is that the government is one of the major clients, the biggest industries, in New South Wales. There is a role by leadership. There are different phases of the government.

We enter the market at different points, but I think the earlier adopter of those early technologies themselves, by guidance, takes out some of the sting. I do not see the New South Wales government investing in co-investment of new technologies, but being early adopters of the technology takes away the risk profile for other industries looking to adapt. They are looking for guidance. At the moment the biggest challenge to this state and region is energy literacy. That is the big one. There is so much coming at people it is hard to know what the truth is. I always say the difference between engineers and scientists is we choose to understand. I think we need to take that course.

The CHAIR: While there is that deficit in energy literacy, there seems to be a great deal of new opportunities that we could potentially be missing out on. Indeed, we have also heard of the skills shortage that you have spoken off. There is lots of talk about all the jobs in the renewable sector, but it is quite clear that there is a skills gap and the need for investment in training.

Professor BROADFOOT: It is understanding what those priorities will be. I tell people that this is a problem of the world and there are so many institutes working on solutions. We need to be party to that, and that is one thing that the research institutes and universities can do. We are partnering with MIT, we are partnering with Pusan University in Korea, and we are partnering with Germany. How do we get that to our market, and how do we adapt it? It is only going to work in this country if we make that research relevant to our sector. We have to make sure that as we are developing, that we get new skills to the coalface. One of the challenges of COVID is that we are cutting courses in universities. We need to make sure that we are prioritising courses, but transferring as quickly as we can.

We cannot walk away, just simply to go back to teaching at university and draw income; we have to have research-led teaching, where we can get that knowledge quickly - we cannot simply get it from a textbook. I used to say an expert was someone who worked on the technology for the last 20 years, the new expert is the person who can read the textbook and understand it, because that is how quickly knowledge is coming at us. More importantly, how do we quickly put those skills together, with that applied research, that knowledge that we have created, and create enterprise? I still think those are the barriers we have to remove. It is sometimes hard to create new enterprise with the risk factors. I was managing director of a company called Ampcontrol. I had the pleasure of taking it from $20 million to hundreds of millions of dollars turnover, but I suddenly realised there is borrow debt versus leveraged debt, and it is a painful barrier to go through for any private sector in Australia to get those funds.

Once you get to leveraged debt it means you are leveraging off your profit, but it is a big gap, and not many industries get through to it. We still have a high failure in start-up companies. It is a very risky business

environment. How do we support that, is the question? The answer, to me, is good supply chains and a network of industry. How do you create good supply chains? Have a good top to that supply chain. The biggest transformation in the Hunter is when we have a new aluminium smelter, or we have a new rolling mill, or we have a new production attracting industry to the region, it is still the biggest driver. What is great about the Hunter is the ability to adapt. We have already gone through one evolution with coal. BHP used to have its coalmines along Belmont and Swansea and they are all gone. The state government had all Elcom Collieries and Newcom Collieries along the west side of the lake. They have been sold to Centennial, but most of them are gone. We have been living this transformation for the past 40 years. This is just the next step in what happens to the Valley.

The CHAIR: Thank you very much for your time today. We may ask you some follow-up questions. Those answers would from part of your testimony. Would you be comfortable to provide us with written responses to any further questions we may seek to ask?

Professor BROADFOOT: Most certainly. And just a note that we did form an energy transition alliance for the Hunter, back in 2016. That report was generated as well. That was before COVID, well before the current discussions with AGL started. It is a good document to refer to that we can forward to the secretariat.

The CHAIR: That would be greatly appreciated. Thank you very much for your time, Professor Broadfoot.

(The witness withdrew.)

(Luncheon adjournment)

JOHANNA LYNCH, Coordinator, Hunter Community Environment Centre, before the Committee via videoconference, affirmed and examined

JOHN HAYES, Long-term volunteer, Climate Action Newcastle, Long term, before the Committee via videoconference, sworn and examined

DANIELLE COLEMAN, Project Coordinator, Hunter Renewal, before the Committee via teleconference, affirmed and examined

The CHAIR: I will now begin the afternoon session for the inquiry into the sustainability of energy supply and resources in New South Wales. This afternoon we will be hearing from the Hunter Community Environment Centre and Hunter Renewal. We are also waiting for Climate Action Newcastle [CAN] to join via videoconference. Ms Coleman and Ms Lynch, do either of you have any questions about the hearing process?

Ms LYNCH: No.

The CHAIR: Ms Coleman, we are having some technical difficulties with your connection. We might try to dial you in through our system in Parliament to ensure a better connection. In the meantime, Ms Lynch, would you like to make any opening remarks?

Ms LYNCH: Yes, I will do. Thank you to the Committee for giving us this opportunity to attend the public hearing. The bulk of what I would like to convey today is the importance of environmental remediation and rehabilitation of polluted sites across New South Wales, forming part of the energy transition. I can speak to the water pollution from coal ash campaign that the Environment Ccentre has been working on, and investigating its process as well, through the past two years. The opening remark is that we convey the importance of remediation and rehabilitation works at polluted sites - from thermal coal mining and burning - to form part of the recommendations, and to be top priority for ministers or the government moving forward.

The CHAIR: Ms Coleman, would you like to begin with any opening remarks or a statement?

Ms COLEMAN: Yes, just briefly. I will start by thanking the Committee for undertaking this inquiry, and for giving us the opportunity to speak today. I am representing Hunter Renewal, which is a network of people, organisations, and businesses from the Hunter who want immediate planning and action towards diversifying our regional economy, so that we are less dependent on coal mining, and less vulnerable as the global energy transition unfolds. The energy transition is happening, and fossil fuel-intensive regions like ours will bear the greatest risk and have the most to lose, if we are not prepared well in advance of serious market decline.

Higher levels of economic diversity will create resilience for our communities, and new sustainable industries will create prosperity and a healthier future for our next generation. Experiences from elsewhere show us that unplanned coal mine and power plant closures have widespread and long-lasting negative impacts, but we are fortunate to have their experiences to draw on, so that we can avoid the same pitfalls. Some regions have or will fare much better than others, because they have taken decisive and early action, to set in place comprehensive

planning for the transition and funding for the future. We can learn from them, and some of the key messages are: that successful transition starts with a locally led process that involves deep engagement and consultation with workers, employers, and the rest of the community.

Also crucial to success is funding and policy support from state and federal governments, for that process. It requires long-term commitment and investment. It will not be cheap, but the cost of not succeeding will be far greater. Successful diversification, on the scale required in the Hunter, will take decades - so we must start now, while the coal industry is still relatively strong, and expected to continue for a decade or two. It will not be easy, but the Hunter is primed for the challenge. We have many strengths and assets to build on here, with our roads, our rail, our harbour port, and our airport, giving us access to domestic and international markets. We have the smarts, in research development and innovation. We have a world-class university and we have a skilled workforce, and strength in manufacturing, agriculture, and tourism, to name just a few.

But, most importantly, we have the collective will of our community to make this transition happen, but now we just need the political will. If the state could start backing that, by backing the 2050 Foundation, that would be a great start. So, if we do not get on with planning and coordination of all sectors and stakeholders in this transition, then we plan to fail. Thank you.

The CHAIR: Thank you, Ms Coleman. I thank you also for your patience with the technical issues we were facing there. Ms Lynch, could you take us through the proposal for the re-use of coal and fly ash, and the barriers that you see need to be moved, to facilitate its implementation?

Ms LYNCH: Certainly, yes. Investigating water pollution from coal ash and coal-fired power stations, the Environment Centre stumbled upon the coal ash re-use industry. Unfortunately, Australia has one of the lowest re-use rates of coal ash in the world, despite having some of the most coal-fired power stations. Some of the barriers include restrictive contracts between, certainly, cement companies and power stations, which, in Queensland, the Australian Competition and Consumer Commission found to be anti-competitive, and the Environment Centre believes there are very similar situations going on here in New South Wales. So, that is one. And the other thing is that power stations in New South Wales were privatised, and so there are now private operators running coal-fired power stations.

The power stations formerly in government ownership were about on the brink of actually establishing industries to re-use coal ash. In fact, the Eraring power station had a plan, under the ownership of Pacific Power, to re-use all the coal ash that it would produce in a year, all of the fly ash. So, we think that government procurement policies will play a key role in taking coal ash from the dump, and avoiding it being put in the dump, and putting it into building products. We are working on firming up a little bit of market research, but coal ash and fly ash can be re-used as a substitute for sand in cement products, so, from our perspective at the Environment Centre here in the Hunter, it saves on the mining and extraction of other materials, including bushland and the destruction of habitat, and it could really be a prime example of the circular economy, and a sustainable industry that has reasonable jobs attached to it.

We are quite excited about prospects, but, as I say, the barriers at this stage are power stations operating as for-profit industries and not wanting to deviate too far from generating electricity, which is fair enough. However, there are huge legacy pollution issues that they are responsible for, as is the state government. So, yes, government procurement policies to facilitate the use of fly ash in cement would be a key one, which may go a way also to addressing the restrictive contracts that are in play. One more thing is the way that coal ash is classified at the moment. It is not classified as a hazardous waste, in order to incentivise its re-use. It is a hazardous waste. It contains heavy metals. There are small portions—trace elements—leaching into waterways. But there are 216 million tonnes of coal ash currently contained in unlined dumps across New South Wales.

So, the classification of the material needs some attention, and we will be pro coal ash re-use, but also pro it being treated like the hazardous waste it is, and there are particular processes, such as sintering the ash, which demobilises the pollutants, and makes it more suitable for use in building products. It makes it safe, basically, so it gets it away from waterways and food sources, processing it into building materials, and the pollutants are spread out across a big area, and they are not as harmful. We also want to see them away from waterways but, yes, the classification of the waste, and the regulation of the waste, and policies to support the establishment of this industry that has a market would be some of the key things that we would like to see.

The CHAIR: Thank you. I think we may have lost Ms Coleman. Do we have Mr Hayes? Sorry, Ms Lynch. We are having a few technical difficulties here in Parliament. Who do we have on the line? Ms Coleman, are you on the line?

Ms COLEMAN: I am here. Can you hear me?

The CHAIR: Yes, we can. Ms Coleman, towards the end of your opening remarks, you talked about the 2050 Foundation and the need for government support for that. In terms of that process that the Joint Organisation of Councils has undertaken, are you supportive of that process? Do you feel it is reflective of the community and is a key next step to get diversification in the Hunter underway?

Ms COLEMAN: Yes, absolutely. We need a locally led authority or task force of some sort to see us through the next decades of change. We are supporting the Hunter 2050 Foundation because it is a collaboration of all the Hunter councils, and we have spoken with them extensively about their proposal or their plan for the Foundation. We are certainly backing it, provided that they continue to liaise with and consult with community. I think that that needs to be deeply embedded in the Foundation, if and when it becomes established. We are supporting it 100 per cent. We would like to see funding from the state government to get that up and going. Without that, we have nothing; we do not have a plan to see us through the transition.

The CHAIR: My next question is to both Ms Lynch and Ms Coleman. Unfortunately, we are not in the Hunter. We had hoped that these hearings would be in the Hunter but, because of the pandemic that we are experiencing and restrictions around that, that was not possible. Again, I appreciate your patience throughout the process in which we are engaging with you. Will you share with us the feelings and views of the Hunter community when it comes to the workforce, workforce planning, and diversification of the economy, especially in the context of the extra pressure that people are under as a result of the pandemic? If you could speak to the community's views and attitudes about transition and the impacts on workforce planning. We might start with you, Ms Coleman.

Ms COLEMAN: Sure. We have spent the last few years talking to people in the community. We have doorknocked and surveyed over 1,000 people—in the Singleton and Muswellbrook shires particularly—about their concerns about the future. For the most part, these people are either workers in the coal industry, or somehow related to the coal industry. There is certainly a lot of concern. Around 90 per cent of the people we surveyed said they want a plan for what comes after coal. Those that are working in the industry know that there is a change coming, and there is a transition afoot. They know that their jobs are not secure for the long term in that industry.

A lot of people that we spoke to said that, without coal, there is nothing for them in the area and they will have to go elsewhere for work. A lot of people threw their hands up and said they did not want to think about it. They are terrified about what they will do if there is no coal industry. But generally, everyone we have spoken to wants a plan. The problem is that there are so many people working in the industry. There is something like 15,000 directly employed in the industry, and then there are all those support services, and the contractors, plus all of those businesses in the region that support the economy, and would not be there without the population and the people who work in the mining industry.

There is a lot of concern that, when it comes to workforce transition, there is not a lot going on. At Liddell, the federal government has funded an employment facilitator, to help support those 300 workers in their transition. If you are looking at 10,000 or 15,000 coal workers, you are going to need a lot more employment facilitators to help them through the process. I am particularly focused on the local government areas of Singleton and Muswellbrook, because that is ground zero—that is where the coal miners are. There are not a lot of training facilities there. When you look at the TAFE courses, the offerings are abysmal. There are barely any trade certificates there. I think they only have 12 offerings at each campus, and half of those are basic administrative courses. There is a lot of investment that could go in to supporting the training and education sector in the upper Hunter, and in those LGAs. There is a lot of work to do, and it will not come easy. Looking at other regions that are going through transition, massive effort and money and planning has had to go into retraining workforces.

The CHAIR: Thank you very much, Ms Coleman. Before I give Ms Lynch the opportunity to address that question, we are now joined by Mr Anoulack Chanthivong, the member for Macquarie Fields. We are currently joined by Ms Johanna Lynch, from the Hunter Community Environment Centre, and Ms Danielle Coleman, from Hunter Renewal. We have had issues connecting with Mr John Hayes so he is not with us. I now go to Ms Lynch to talk about community attitudes and concerns towards the transition.

Ms LYNCH: My experience of the community sentiment around the transition of coal-fired power stations in particular and then, to narrow it down, the legacy of pollution liabilities attached to the coal-fired power stations in New South Wales, is that they are quite fearful that the waste, and the pollution that is stemming from the waste, in those sites will go on indefinitely. That is a concern, because coal-fired power stations are all near big bodies of water. Let us take Lake Macquarie, for example. It is a beloved coastal lake, and is the biggest salt water lagoon in the hemisphere. It is experiencing significant amounts of heavy metal pollution in the southern end, from the Vales Point and Eraring power stations. There is also the Pasminco smelter at the northern end of Lake Macquarie. So the pollution issues, in the minds of people in the region, are kind of fresh. There is a fear

that, with the current plan for remediation, which is the cap and cover approach, that the leach out from these ash dams is going to continue.

It is accumulating in the seafood in Lake Macquarie, and there are government studies that testify to that as well as our own investigations. Water sampling shows that heavy metal pollution is an issue, and there is a concern that the power stations are going to close, and not only will the jobs and the transition of the workforce not be handled in the desired way, but they also fear they will be living with that pollution for the rest of their lives. Port Augusta is one of the power stations in Australia that has closed and that is currently the precedent. There were ongoing air pollution issues from the open ash dam and the 60 millimetres of topsoil that got put on top of that ash dam. There are various approaches—with varying degrees of rigour—that different power station owners take to rehabilitation of their ash dams.

As I mentioned, the establishment of a coal-ash reuse industry to remove that pollution from big populations and big waterways and environments and food sources is really important. I think there is support from a lot of people—people who work in the industry too. They live in the area a lot of the time, and they want to enjoy Lake Macquarie, and catch a fish and eat it from Lake Macquarie. They do not want to have to worry about the legacy of pollution from the industry that they worked in. Conversations have been had with coal industry workers who were at first stand-offish about what we are talking about when we criticise coal-fired power stations.

But when they hear that we are talking about the pollution that is stemming from it, and that the regulation around it could be better, and that there are ways to solve this pollution problem, they are really supportive. You can't argue that water has been polluted, and that it is illegal to pollute our water, and there are new industries and jobs associated with the clean-up solution. That is quite a specific take, but in terms of the pollution and the need for remediation, the community sentiment is overwhelmingly supportive, but also fearful, because there is a lack of tangible plans at the moment. We are working towards getting those in train, and we have some proposals for that. So, more tangible plans for the remediation of these sites. It is the whole thing. Just having some tangible plans, and involving the community in the process, and informing them, is important.

The CHAIR: Could I ask if either of you can comment on the potential for job creation as a result of mine rehabilitation?

Ms LYNCH: I will leave that to Ms Coleman.

The CHAIR: Ms Coleman?

Ms COLEMAN: I am struggling to hear you.

The CHAIR: My question was about job creation from mine rehabilitation. Can you comment on that and what you see as the potential there?

Ms COLEMAN: There is a lot of potential for jobs, in both mine rehabilitation and reuse. We have got vast tracts of land that will need to be rehabilitated. The NSW Resources Regulator has just come out with a proposal to change the regulations, so that we start rehabilitating land faster, progressing rehabilitation earlier on in the mine's life-cycle. That will create a lot of jobs - not just for people currently working in the mines and filling in the holes - but also there is the replanting that goes along with that. There is all sorts of engineering that goes with it, and then there are the nurseries. At this stage, we do not have a lot of locally sourced seedlings for that replanting. That is a huge industry that would go alongside that—having the nurseries to grow the plants.

There are endless uses for coal mines once they have been rehabilitated, and you can see that overseas in other areas, particularly in Germany, where the re-use of land has created all sorts of things, like tourism facilities. They are growing grapes and making wine on rehabilitated mining land. There are all sorts of possibilities for that and it is a big job. A massive part of the transition for the Hunter will be the rehabilitation of coal mining lands.

The CHAIR: Thank you. I can see that we have now been joined by Mr Hayes. Mr Hayes, can you hear us?

Mr HAYES: Yes, I can.

The CHAIR: Great. What we might do is ask whether you would like to take the oath or make an affirmation so we can begin the process.

Mr HAYES: [Inaudible]

The CHAIR: Have you received those documents?

Mr HAYES: I am sorry, I have just come in very late to this.

The CHAIR: For you to be able to provide evidence, we do need you to take an oath or make an affirmation. Committee staff will send you details on that so that you are able to do it. While you are being sent that information I might ask if Mr Griffin has any questions for Ms Lynch or Ms Coleman.

Mr JAMES GRIFFIN: Thank you, Chair. Ms Lynch, thank you for expanding and giving a view on the coal ash issue. Hypothetically, if the power station were to close next year, for example, to what extent and how long would the opportunity be there for the coal ash to be used in, as you said, cement and other construction opportunities? Is there a legacy of six months' worth of work or another year? How much opportunity exists in that proposal that you have outlined?

Ms LYNCH: Do you mean in terms of getting the industry established?

Mr JAMES GRIFFIN: No. In the event the industry was established, how much [inaudible]—

Ms LYNCH: How long?

Mr JAMES GRIFFIN: Yes.

Ms LYNCH: There are 215 million tonnes in total, stored in dumps, currently accumulated. The most recent estimates that we have got are that it would be decades' worth of coal ash. The industry would last for a couple of decades at least. There is a lot of ash there. Of course, it depends on the products that you are making. The range of products you can make require different quantities of ash. The chemical content of the various different ash—each a different dump space and the coal that is burned—means that there are different products that are more suitable. But there is decades' worth of coal as a re-use industry, for aggregates and building products, which is probably not going to dry up too soon, in terms of the demand.

Mr JAMES GRIFFIN: I had not appreciated it was that—I thought it might have probably been exhausted over a couple of months or years, but I did not know that it was that long. That is interesting, because I think that leads into some of the other commentary and discussions that we have heard over a number of months now, in that I think from broad range of submissions and groups that we have spoken to, there is an appreciation that the discussion has moved from a possible transition to "it is happening and what we need to do about it". But I think some of the challenges have been practical next steps, the initiatives and the projects. Thank you for bringing that to the attention of the inquiry.

Ms LYNCH: There is a series of steps. Feasibility studies are needed, and research and pilot plants. That could happen quite soon. There are people in New South Wales who have technologies that can process coal ash and are vying to access it, so it really could happen quite quickly if the will is there.

The CHAIR: Thank you. Mr Hayes, have you received the oath or affirmation documents?

Mr HAYES: I am just looking now, thank you. Thank you for sending them. I am sorry to be delayed like this. Technology is a bit tricky sometimes, is it not?

The CHAIR: It gets the better of the best of us. Mr Hayes, just in the interests of time I might just let you get that document up, and if you could just raise your hand when you have received it I will know to come to you at that point. Mr Smith, do you have any questions for Ms Lynch or Ms Coleman?

Mr NATHANIEL SMITH: Thank you, Chair. Thank you for coming today. Sorry, I have turned off video because the internet is playing up a bit. Obviously in my electorate of Wollondilly, we are very similar to the Hunter. Obviously we have got a coal mining community—mainly coking coal and longwall mines. We have got a history of collieries across Wollondilly. We have got the equine community, agritourism, vineyards—all sort of similar stuff to the Hunter Valley, in a lot of ways. Through COVID, over the last six months, we have seen how important it is to have a good-paying job, access to shelter, food and water—we have really gone back to the basics, in a lot of ways.

My concern is, if there is a transition towards renewables, and a scaling-down of thermal coal mining in the Hunter and coal-fired power stations, the biggest issue that has come out of this inquiry, when we have been speaking to witnesses, is how many jobs you are going to be able to replace with new technologies and renewables. Will it be to a similar salary? What sort of processes have you got in place now to help train new people into renewables, if that switch was to happen shortly rather than later?

The CHAIR: Ms Coleman, we might start with you.

Ms COLEMAN: Again, it is still hard for me to hear those who are chiming in via video link. In terms of jobs, the jobs are not just in renewable energy. A lot of jobs have been identified by Beyond Zero Emissions [BZE] in its Million Jobs Plan that are not specifically in the manufacturing of renewable energy, but also the building of zero emissions buffers. It identified 50,000 job opportunities for the Hunter region over the next

five years, in retrofitting homes and businesses for energy efficiency, fly ash—as Ms Lynch was talking about—the land and re-vegetation projects, the rehabilitation, and green steel.

Recently, the Institute for Sustainable Futures also did a report identifying, I think, 45,000 jobs out to 2035—a minimum 45,000 jobs in renewable energy as well. Of course, that is building the network, bioenergy, and the professional services that go with that, renewable hydrogen, and various other things. Also, if we put resources and support behind our other existing industries in the Hunter—like the agricultural sector—and really boost them, and help them to innovate and grow, and if we unlock land for them by rehabilitating land, and unlocking buffer lands there is huge potential for jobs. There is huge potential for jobs. It has been proven elsewhere in regions that have transitioned well. It can be done. But we just need to be brave enough and bold enough to step up and grab the bull by the horns.

The CHAIR: Ms Lynch, would you like to add anything to that?

Ms LYNCH: In terms of the Hunter, the number of jobs in coal ash re-use are fewer, but they are long-term jobs, and right at the source of coal-fired power stations, which are set to experience retrenchments, as decommissionings happen, as the transition unfolds. We think that is one of the key points in favour, if we can embark on retraining and reskilling the workforce. People do not have to relocate, which is one of the biggest problems in those particular age brackets, of people employed in coal-fired power stations, for whom relocating is a big deal—and to find new work. They have worked for decades at the power station, and a job inside re-use manufacturing, with retraining, would enable them to continue working at the same place, and living in the same community as they always have.

The CHAIR: Mr Smith, do you have any additional questions?

Mr NATHANIEL SMITH: No, no further questions.

The CHAIR: Thank you. Mr Hayes, are you able to take the oath or make an affirmation?

Mr HAYES: Yes, and I do apologise. I, John Lachlan Hayes, swear that the evidence I shall give before this Committee shall be the truth, the whole truth and nothing but the truth, so help me God.

The CHAIR: Mr Hayes, would you like to make an opening statement?

Mr HAYES: Yes, I have come into this with knowledge of the submission that Climate Action Newcastle has prepared. I am not its principal spokesman, but I am helping out. I am very well aware of that. Just in the few minutes that I have been on the call I have heard from Jo Lynch, and I understand - and I can tell you that Climate Action Newcastle would support what she has been saying, in connection with the coal ash. I heard one of the other speakers talking about many of the proposals put forward in the BZE Millions Jobs Plan. I am well aware how many of those opportunities exist in the Hunter. So, the position from Climate Action Newcastle is, that there needs to be a re-powering of the Hunter, using renewable energy. Gas, except in the very short-term, is not the answer. Renewable energy is available in all sorts of ways, including battery, wind and solar power, hydro - and there have been a number of locations identified in the Hunter where hydro can [inaudible]. Indeed, I am aware how compressed air can work a bit like a hydro.

There are opportunities here, and we would encourage the government, and all the members of your panel, to be optimistic and grab with both hands the opportunities there. The other thing, of course, that Climate Action Newcastle would like to say is, that it is very obvious, most particularly from the most recent bushfires and droughts that we have experienced, that many things need to be done which are different to the way in which they have been done. There is an acknowledgement that coal has provided a very long and important opportunity for growth in this area, but it has passed its day. Even though Newcastle is still the largest coal export port in the world, we cannot continue to travel down that route.

You will see an appendix that is at the back of the submission, which is from material that I provided. We cannot continue to provide coal running out of this port in the way in which it has been done. We, in fact, will not be the deciders of that; it will be the importing countries. Some coal goes to China, but more particularly, Japan, and South Korea, and some to Vietnam. So there will be changes. There is movement all over the world for change, and we would encourage and welcome this Committee to grab with both hands these opportunities. We need direction from the government. Individuals are making their decisions. For instance, I pay nothing for electricity, because of the solar panels and the solar hot water that I have got on my roof.

Companies are making decisions. There is a company in Newcastle called Molycop that has recently signed a power purchase agreement for 55 per cent of its electricity to come from renewables. Some people are making decisions. The last people along the line are the federal government, and we would hope that the state government would move quickly down this track. I am not sure that there is a heck of a lot more that I can add.

Mr ANOULACK CHANTHIVONG: Thank you for coming today. I have a question to Ms Lynch. I heard your submission earlier. Regarding the pollution from fossil fuel, mainly coal, do you have reports on that? From where are you getting the information? What is the cost involved? What are the opportunities for remediation?

Ms LYNCH: Yes, absolutely. The Hunter Community Environment Centre do our own water testing and sampling in Lake Macquarie, outside the power station. But the bulk of our information comes from publicly available Environment Protection Authority monitoring data, water pollution data, as well as government studies. There is also what recently came forth, as part of another inquiry, based on contamination studies that were done by consultants, at the point of sale of the power stations. Although there are some flaws in them, they are the most comprehensive datasets on groundwater contamination, indicating levels from ash dump sites.

There also are organisations that choose to put an end to that pollution and are putting [inaudible] our own policies on the industry and supporting their establishment of the industry. There are many precedents across the world about how coal ash re-use industries have got started. We are in touch with a fly ash manager at the Eraring Power Station, which is the biggest power station in New South Wales. So, yes I can definitely forward some data, and point to where we are getting that information from.

Mr ANOULACK CHANTHIVONG: That would be most helpful if that is not too much trouble. Please send it through to the Committee.

Ms LYNCH: I can do, yes.

Mr ANOULACK CHANTHIVONG: I would not mind reading that, because we have seen a lot of mine rehabilitation has not been as much as it should have been, both here and in Queensland, where the most damage is done. The rehabilitation aspect of it has not been up to the standard that, perhaps, of what the community expects. This is part of a valuable discussion. Mr Hayes, or Ms Coleman do you want to add anything?

Mr HAYES: I can add, if I may, in the appendix to the CAN submission, there are a number of statistics about the way in which trains carry the coal down the Hunter line. I can point to those briefly there. About 160 million tonnes of coal is exported annually, through the Port of Newcastle, which comes down to the port on 22,500 coal trains. Those wagons are all uncovered, so you can see a potential for pollution - starting at the mine head, and arriving at the Port - from those coal trains. Those coal trains are usually pulled by three or four locomotives and, of course, they come down, and go back. So there are 22,000 trains that come down full and 22,000 trains that go back up the valley empty. That is more than [inaudible] 200 diesel road carriage.

And then you have got 4,000 coal ships coming into the Port, each of which are controlled by tugs so you have got 14,000 tug workers. They are just the raw statistics. You can draw from those statistics a conclusion about how all of that activity adds to the pollution load in the air [inaudible} in the lower Hunter.

Mr ANOULACK CHANTHIVONG: My next question is to Ms Lynch. The Community Environment Centre has been working with a number of community groups within the Hunter area in terms of—I know you might be focussing on the environment—the social consequences of if the fossil fuel industry just disappeared out of the market. [inaudible] Are you doing much work on those areas of the community that might be impacted more than most, given we move to renewables too quickly? What can the community sustain, because of the longer term intergenerational consequences of [inaudible]. I refer to environment, social issues involved when there are not industries to support people's lives [inaudible].

Ms LYNCH: Certainly. The first thing, I say, is that not only the retirement of industry poses a risk, but the degradation of environment poses a big risk, for intergenerational equity. The Hunter Community Environment Centre has been focused on the environmental impacts. I would invite Ms Coleman to talk more about Hunter Renewal's body of work, which addresses more specifically what you just outlined, I believe.

The CHAIR: Ms Coleman, did you hear Mr Chanthivong's question sufficiently?

Ms COLEMAN: Can you restate it, I can hear you better than I can hear anyone else.

Mr ANOULACK CHANTHIVONG: All I wanted to ask is whether there was understanding of the consequences upon the communities that would be impacted economically, which has correlation to the social issues that would occur through long-term unemployment, poverty, substance abuse, and all those issues that need to be taken into account, as well as the environmental costs. I am asking about both sides of the equation.

The CHAIR: Ms Coleman, just to reiterate Mr Chanthivong's question, he is asking about the longer term economic employment risks and intergenerational issues, such as poverty, of a rapid and unplanned transition, and what work has been done in that space.

Ms COLEMAN: In terms of work being done in that space, there is no work really being done, and that is why we need some kind of transition authority or task force to take that up, and start talking to the workers in the Hunter about what their plans might be, should their jobs disappear overnight, as we have seen in other regions when coal companies pack up and leave at short notice: Mortgages default, and people have to leave the area, or they cannot afford to leave the area. The intergenerational impact of unemployment, and what can often become long-term unemployment - if we have not put things in place for workers to transition into other jobs and industries - then those coal miners are at serious risk of long-term unemployment. Some of them may never re-enter the workforce.

We have seen that in many other regions around the world where rapid transitions have occurred. The work that needs to be done immediately is: One, set up this task force authority; and, two, get on the ground in the Hunter and start talking to the workers. They are the people that need to be in the mix, in the conversation right now, talking about what they want for their futures. What sort of jobs can they see themselves moving into? What would they like to retrain in? We like to talk to small businesses in the region. Some of them rely entirely on the coal economy. Most of those businesses in Singleton and Muswellbrook are completely reliant on the coal economy, because without the coal mining population, they cannot exist. You need to talk to people: How might they diversify their own businesses? How can they prepare? What sort of money do they have in the bank to weather the storm?

COVID has been a terrible rude shock to everybody and it has shown us, particularly in the Hunter, how things can change really suddenly, and the rug can be pulled out from underneath us without notice. It is really alarming. And it is urgent that we get talking to communities. We have a great chance of success, which is proven from other regions that have transitioned well, that the most successful transitions come when you communicate with community, when you involve the workers, when all the stakeholders are brought to the table from the outset and given a fair chance to speak their minds, to talk about their fears and hopes, and to be involved in the planning. If a plan comes from elsewhere, and it is imposed on us, it is bound to fail. It needs to be from the ground up, and that work has to start yesterday. We are already behind the eight ball because COVID knocked us for six.

I am not sure that the Committee is aware of this, but in the Hunter already, Peabody's Wambo underground mine has already halved its workforce - or is planning to soon halve its workforce, and scale back production. Glencore is putting its production on ice, and putting its workers on forced leave at the moment because there is no market for the coal; they cannot sell it, so they have to stop mining it. BHP is selling off the Mount Arthur coalmine. Bloomfield coal has put 300 workers on JobKeeper, and Yancoal shut shop in March, with 90 jobs lost. It is already happening. You have COVID impacting us massively. The Hunter Research Foundation in July told us that the Hunter was suffering more than most areas, in terms of job losses and unemployment, and then you add on top of it, a decline in the coal market. If we are not careful, we are up the creek without a paddle. It is urgent that we get planning. We cannot afford to lose the Hunter communities. We need to put things in place now.

Mr HAYES: I would like to support those remarks. We can look to two instances, one in the Latrobe Valley, where a very big coal-fired power station closed suddenly, and there was great disruption, and there were no transition arrangements in place. The people from the Latrobe Valley have come up here to Newcastle and told us, you have to get going now, you cannot wait for the closure. We have local knowledge in an adjoining state. If you look overseas, in the Ruhr Valley, there was a plan to have a downturn in coal, and they have an 11-year transition plan. We have got nothing, the Ruhr Valley has an 11-year transition plan, and in the Latrobe Valley things happened too late. I do not know whether your Committee has a copy of the Million Jobs Plan.

The CHAIR: We do.

Mr HAYES: There is roadmap after roadmap of the various things that can be done. I can tell you that a lot of the groups in Newcastle, working closely with me and with each other, are in discussion about these things. We would very much like to hold the hand of the government and we would very much like the government to hold our hand on these matters.

The CHAIR: I thank you all for joining us this afternoon and being flexible with the technology challenges that we faced. Could you send copies of your opening remarks to the Committee staff to assist Hansard? It is likely that we will send you follow-up questions; the answers to those questions will form part of your testimony, would you be comfortable in receiving written questions?

Ms COLEMAN: Yes. I would be very happy. I feel I have missed out on half the conversation because of technology. If you would like to send me any more questions I would be very happy to respond to those.

The CHAIR: To assure you, we greatly appreciate the content you have been able to provide us with. The tech has been a bit sketchy today but your comments will be reflected in *Hansard* and we can make sure that you are comfortable with the way in which those are recorded. I appreciate your patience.

(The witnesses withdrew)

(Short adjournment)

ELIZABETH MOLYNEUX, General Manager, Policy and Markets Regulation, AGL Energy, before the Committee via videoconference, affirmed and examined

JOHN MCCORMACK, Head of Government, AGL Energy, sworn and examined

BOB HAWES, CEO, Hunter Business Chamber, before the Committee via videoconference, affirmed and examined

ROB MURRAY-LEACH, Head of Policy, Energy Efficiency Council, before the Committee via videoconference, affirmed and examined

The CHAIR: Ms Molyneux, would you like to make any opening remarks?

Ms MOLYNEUX: My name is Elizabeth Molyneux. I am AGL's General Manager of Policy and Markets Regulation. Unfortunately, I am stuck in Melbourne for the time being but, as you acknowledged, my colleague John McCormack is joining the Committee in person. We both would like to thank you for the opportunity to address the Committee today. I will make a brief opening statement before we do our very best to answer any questions that you have.

I will spare members a lengthy introduction to AGL, just except to note that AGL was established in 1837 in New South Wales, just following the inaugural New South Wales Parliament. We are Australia's oldest operating energy company, and we currently supply gas, electricity, and telecommunications to almost four million customer accounts across Australia. We are very proud of the contribution we make to New South Wales. We have coal, gas, wind, and solar generation scattered from the Far West in Broken Hill and Silverton, to south-west Sydney and north-west in the Hunter Valley. We are the largest generator in New South Wales. We also are Australia's largest carbon emitter, while also being the largest private investor in renewable energy.

Since 2014 we have owned and operated the Bayswater Power Station, and the Liddell Power Station. These operations include complex water, coal, rail, and ash infrastructure systems, that operate to produce around 23,000 gigawatt hours annually, or roughly speaking, 35 per cent of New South Wales' electricity supply. The combined operations of the Bayswater and Liddell power stations, known as AGL Macquarie, is located between Singleton and Muswellbrook in the Upper Hunter Valley of New South Wales, and employs approximately 600 people directly. Bayswater and Liddell have been a major source of direct and indirect employment to the region over the last 40 years, and currently contribute more than $1.35 billion annually to the regional economy.

As I am sure the honourable Committee members are aware, we have announced the closure of the Liddell Power Station in 2023, giving seven years' notice of this decision. We have also announced that Bayswater will close at the end of its life in 2035, and that our Camden gas project will cease production in 2023. We have a proud history of renewable energy generation in New South Wales. In partnership with the New South Wales Government and the Australian Renewable Energy Agency, AGL's Nyngan and Broken Hill solar plants helped to give rise to the large-scale solar industry in Australia. We have recently completed the 200 megawatt Silverton wind farm, just west of Broken Hill. AGL has announced a range of other projects, as part of our NSW Generation Plan released in December 2017 as part of our response to the closure of Liddell in 2023.

In August we announced that we have lodged a scoping report with the New South Wales Department of Planning, Industry and Environment for a grid-scale battery system to be located on the Liddell Power Station site, alongside the existing plant. The Liddell battery is part of the 850 megawatt multisite integrated battery system that we are aiming to develop by 2024. We believe that Australia's energy future will be affordable and smart, delivered from renewable sources, that are backed by flexible energy storage technologies, which come together to power our homes, businesses, and vehicles. Importantly, it will be low emissions based. Thank you again for the opportunity to address the Committee today, and we look forward to answering your questions.

The CHAIR: Thank you very much. Mr Hawes, would you like to make any opening remarks?

Mr HAWES: Thank you to the Committee. I will not go into all the background either. I commend the Hunter Business Chamber's submission to you as details about our organisation and who we represent. I would

like to stress that the Hunter Business Chamber is representing the interests of business and industry in its evidence to the inquiry today. In the Hunter we have a vast range of high energy using industries, where cost and reliability of energy supply is absolutely vital.

We all agree the renewable energy industry needs to be expanded, and the Hunter is an ideal region for this to occur. However, it is currently a bridge too far for many of our industries to immediately adapt to renewable energy sources. Based on the technology that they have in place, they still need firm, dispatchable power, generally supplied from thermal sources, so what is constraining change? We believe two separate markets for energy exist, and they are distinctly different: Firstly, there is a residential market. Secondly, there is an industrial market. We believe that the first is well understood, and coping well with change to renewables [inaudible]. The second, or the industrial sector or market, is not so clear in our view. So, how do we overcome this, to bring industry along for the journey, and ensure that it is well placed to adapt to change? In this context, we believe government needs to consider the answers to a few questions.

Firstly, consider scoping and undertaking an energy audit of particular businesses and industry across New South Wales, to fully understand where they are, and what their needs are; secondly, conducting a full assessment of the costs and timing of conversion for industry to tap into and adapt to new forms of power; thirdly, augment the existing industry assistance programs, and devise new programs that will incentivise and assist businesses to undertake investment and conversion, to allow them to continue to contribute to the economy—it should not be one or the other; and fourthly, reduce the scope to procure goods from overseas, when government is contracting for materials otherwise manufactured here, so business is supported as they go through this transition and change. I am happy to provide examples to illustrate these points, and will welcome any questions from the Committee related to our formal submission or the comments I just made. Thank you.

The CHAIR: Thank you, Mr Hawes. Mr Murray-Leach, would you like to make any opening remarks?

Mr MURRAY-LEACH: Thank you. I am Rob Murray-Leach from the Energy Efficiency Council. We are the peak body for energy efficiency in Australia. Our members include large multinational corporations, local small businesses, academic institutions, researchers, and government sector as well. As a basic introduction to energy efficiency, it is actually the largest form of capacity in the energy market, and so there has been huge research on this, by the International Energy Agency and others. If you think about it, as we need less energy, that actually reduces the need for capacity on the supply side, so it is about better matching our supply and our demand. As you go forward with more intermittent sources of energy coming onto the system, the ability to have flexible demand really helps integrate that new supply at the lowest cost possible, while maintaining energy security.

We are very pleased that the New South Wales government really is, and has been for quite a while, the leading government, in terms of its thinking around energy management, and integration of energy management into the energy system in New South Wales, and the energy security target is part of that. The energy efficiency sector—and this is, of course, very relevant right now—is also a very jobs-intensive field. The minimum estimate of roles involved in energy efficiency in Australia is 58,000, and that is the absolute lowest ballpark figure. But we know that it is one of the most jobs-intensive areas in the energy sector, from recent research by the International Energy Agency and the International Monetary Fund, so stimulus in energy efficiency creates a higher job multiplier for $1 million of expenditure from both the private and the public sector. You have a much, much higher level of jobs created than any other form of energy.

It is also something we should undertake for a range of other reasons. While we can think about energy efficiency through the benefits that it creates in terms of energy capacity, flexibility, security, and reliability, and also those benefits in terms of jobs creation, which are so critical now, and the reason that so many governments around the world are currently focusing on energy efficiency as their main form of stimulus; in a way, those are actually by-products of things that we should be doing anyway. We are just coming out of the winter period in most of Australia, and many people who have been working from home really have been experiencing how truly awful their homes are at keeping them warm over this period. It is actually notable that Sydney has got almost twice the rate of cold-associated deaths as Stockholm in Sweden, largely due to the poor quality of our homes. So, improving the way that we use energy in homes is really, as I said, a by-product of making them fit for habitation, which has very significant benefits for our energy system.

I would really like to reiterate what Mr Hawes said: There are really substantial benefits for helping businesses to better use energy as well. So, regardless of the source of energy, helping business to become more productive with their energy does two things: one, it obviously lowers their energy bill, and that is particularly important at the moment with gas and gas prices—they are low at the moment, but most of the predictions suggest that they will be ramping up again—but, just as importantly, in a way, energy management is a way to look into the operations of a business, particularly a manufacturer, and understand where it is being most productive. Our focus, I guess, in this instance, is really just to support the Committee with any thoughts that it has in the

space around the energy sector, and just reminding that, of course, how we use the energy coming out of the energy sector is critical both for the end users, but also for the affordability and stability of the grid. Thank you.

The CHAIR: Thank you. I will begin the questions, starting with Mr Hawes and the representatives of AGL. I am interested in your views on the transition planning that is happening in the Hunter region, the work you are involved in, and the work you are supporting. We heard earlier today from representatives of the Hunter JO who talked about the great work that it is doing. How is transition planning happening in the Hunter, and are there any gaps you have seen where government support would be useful? Mr Hawes, we might start with you.

Mr HAWES: Thank you. Yes, I think, as the JO, Mr Joe James, noted, and so did Professor Alan Broadfoot, that there are - at an industry level - lots of early adopters doing their own thing. We are lucky that we have industries up here, that have the capacity to go out and undertake a lot of their own research and development to try to implement change, and that goes for not only industries that are using energy, but also those that are involved in the mining of coal, not only here in Australia, but the majority of it, of course, going off to overseas. I think it is fair to say, though, that a lot of that stuff is in its infancy, that it is not as well-connected as it could be. Professor Broadfoot referred to the Newcastle Institute for Energy and Resources committee that he chairs. I am also on that committee. There are a lot of good things that are coming up, in the context of being able to take innovations, adapt to change and do things with it, but it does not always land, unfortunately.

That can be for a variety of reasons, be it lack of investment, finance, or whatever, and we have seen that quite widespread in renewable industries generally, as well as across business. So from a government point of view, I think understanding the width and the breadth of the exercise that needs to be undertaken, and the importance. That is why I think an audit with a system that regards [inaudible], bearing in mind, the industry uses a far greater amount of the power that is generated than domestics do, particularly in the Hunter. We have the largest power—continually using 10 per cent of the state's power in Tomago Aluminium, and a couple of other very large industries that are high consumers. There is stuff going on. I do not agree completely with what has been suggested by others, that there is nothing happening. There is stuff going on, but it could be better connected in my view.

Mr McCORMACK: I guess at AGL when we think about transition, there are three different elements. There is the energy transition itself, in terms of replacing the megawatts lost by, say, a power station like Liddell coming offline. Then there is the economic diversification of the Upper Hunter for us, in particular, where the majority of our operations in the Hunter are based, and then, most importantly, there is supporting our workforce, in terms of the transition of their jobs. I guess in terms of the energy transition itself, we have been very clear about our plans of replacing the Liddell Power Station, which is going to retire - the first unit in April of 2022, and the remaining three units in April of 2023.

We have seen, throughout the last few years, a focus from a range of governments, in terms of ensuring that those megawatts are replaced. Quite helpfully, we had the federal government and the New South Wales government's Liddell Taskforce report handed down less than two weeks ago now. And AGL's plans there are predominantly a mix of firmed renewables, including the major elements of that being also the upgrade of our Bayswater Power Station, which will remain in operation until 2035; the new build of the Newcastle Power Station at Tomago, which is currently with the New South Wales planning department for assessment; and then a range of other renewables projects, some of which have been complete, like our Silverton wind project just west of Broken Hill, Coopers Gap wind farm in south-west Queensland, and we have recently announced an intention to lodge a planning application with the New South Wales government for a battery at the Liddell site.

In terms of the economic diversification of the Upper Hunter, in terms of your question, Mr Greenwich, in what we would like to see, we are happy to work with any organisation, and with any government. We are very focused on what we can control, and that includes looking at the diversification of our site itself. We have about 10,000 hectares between the AGL Macquarie site, formerly known as Macquarie Generation, and we only use about 500 hectares of that land for actual energy generation purposes. In 2018 we launched what we call the Liddell Innovation Project, which was a call for great ideas from industry and others, as to how we could use that land. It has got a lot of natural advantages. It has obviously got a lot of power, and opportunity to generate power on that site via very strong transmission. It has got access to some very major highways, and there are also some existing water licences, and things like that.

We received about 25 different responses to that, some of which we are currently progressing with those organisations. For us, it is about leading by example, and showing how we can lead that, in terms of replacing some of the jobs that will be lost when Liddell closes in 2023. It is important, when we are talking about our workforce there, to reiterate that there are no forced redundancies from the closure of Liddell in 2023. As Ms Molyneux mentioned, we have about 614 full-time or permanent roles at Macquarie. That is weighted a little more heavily towards Bayswater than it is Liddell. But again, there are no forced redundancies when that does

close. Some of the generation projects that we are considering in the Hunter outside of our land, include the Newcastle power station, that we mentioned, but also the Bells Mountain Pumped Hydro project, which is in Muswellbrook and, just up the road, the Liddell battery project. We are also actively looking for some other renewable energy generation projects in the Upper Hunter.

The CHAIR: In terms of your workforce, have you conducted a skills audit to understand where there are opportunities for retraining or roles which meet the same salary levels and skill levels?

Mr McCORMACK: Definitely. It is a very strong focus for us at the moment. A number of change-readiness programs, working groups, and employee dialogue groups are working very closely with the different unions that represent our various workforces - at Liddell, but also at Macquarie. We have also established what we call the "Future You" hub onsite, which provides financial and superannuation support, career counselling support, access to external job opportunities, personal counselling, training courses, résumé and job application workshops, and information on different training providers and courses that may help them transition to a different role in the future.

The CHAIR: Mr Murray-Leach, in terms of the potential job opportunities within energy efficiency that you spoke about, what needs to be done to see that achieved—particularly, say, in the skills and training space?

Mr MURRAY-LEACH: I will probably answer that in two parts. I will start off with the roles that are available in there, and what needs to be done to unlock that opportunity. As discussed, probably one of the first areas is in the manufacturing space and business sector, where we are largely talking energy audits of sites. It is quite a specialist area. You do need to have a reasonable knowledge of energy and engineering, but obviously there will be people from within the current Liddell workforce who have that skill set. The other range, which is far broader, is the broad range of skills that are required for retrofitting homes, which is a very big potential area of employment.

A lot of the debate about retrofitting homes is often in single technologies, but the really big benefits come when you actually take an integrated retrofit for a home. There are a lot of homes in Australia that have extremely poor thermal performance, which means they get dangerously hot in summer and very cold in winter. To give you an example of that, there is an estimate produced by the University of Melbourne, looking at the Melbourne building stock. If you looked at the existing buildings, and you upgraded them - to not even the current building standard—let alone the more advanced one—that would have reduced the number of deaths in heatwaves by 92 per cent. It is a very significant benefit we are talking about, from a health and safety perspective.

Those are the types of roles you are looking at. It is analysis of the upgrade of homes, and analysis and support for the upgrade of businesses. In terms of business energy efficiency, there is upskilling required to do that. In the home space you have got a very broad mix of skills, all the way from fairly simple installation, and measures where some health and safety training, in particular, is required to ensure people can do that adequately in a retrofit, but you actually do not need many of the very highly skilled roles, because they oversee a lot of that work. There is a good mix across those two sectors of the sort of relatively straightforward and meatier, more advanced skills.

In terms of what will really get them up and running, there are probably two things. The first is that the New South Wales government has been doing some really great work, in terms of supporting energy efficiency upgrades in businesses, which is currently on hold while those programs are being rejigged. Getting them straight out of the starting blocks will be really important, in terms of getting those jobs created. In terms of the residential space, there are probably a couple of key policies. In the short term, because we are in COVID-related recession, support for households to achieve upgrades to their homes—particularly the lower-income households, and public housing upgrades—is very key, to get out of the starting blocks straight away. In the longer term, one of the most important policies we have seen—which is in place in many other places around the world, and just over the border in the Australian Capital Territory—is actually giving home owners energy efficiency ratings when they buy or lease homes.

That gives them an idea of what is the quality of that home. As soon as you put a quality metric into the market, people actually start to invest. At the moment, it is something that they cannot measure very easily, so they do not invest in those upgrades. Those two are probably the most key ones, for that residential space. As I said, in the business space it is both the rollout and expansion of the current New South Wales measures but also the expansion of the New South Wales government's Government Resource Efficiency Policy [GREP]. What we have seen around the world is that the easiest and fastest way to create jobs is upgrading government facilities—areas such as hospitals, police stations, and so on. For example, in the US, as part of their stimulus, they rolled out upgrades to low-income housing and government buildings, creating about 200,000 jobs over the period of, I think it was, 2011 to 2015.

The CHAIR: Mr Hawes, you wanted to add something?

Mr HAWES: The task in the Hunter—one of the things we should make very clear is that there is no understanding in business and the industry that what we are going to go through is going to end on a Friday and then on a Monday we are all going to be looking for a new job.

The CHAIR: Of course.

Mr HAWES: We advocate that one of the best ways to offset what could be an employment issue through some sort of a transition, is to strengthen existing industry—so that the opportunities are made as we move along—as well as those new industries. That is why I made the point about, particularly, the government procurement. A simple example of that is, the New South Wales government, believe it or not, consumes a lot of wire. It can get wire in two ways. It can procure it from overseas, and there are a couple of rolling [inaudible] in Australia that take imported steel, and they will roll that wire, and they will supply it. The other way is looking at organisations like InfraBuild that recycle steel and metal to produce that wire.

That long chain, of the benefit cost of procuring stuff via that method, is not taken into account when you consider the recycling, the transport via the truck, the guys who are in the arc furnace, the people who are rolling the wire, and they are producing it. Sure, it might be a couple of dollars' difference in an overall package, compared to the imported stuff, but that long-chain cost is the stuff that is going to help sustain industry, so that those jobs are being developed as we move along, as well as what will come from new industry, particularly in the energy sector. I think the Hunter is well placed in that, because we are already a diversified economy, and we want to stay that way.

The CHAIR: Thank you, Mr Hawes. I will now pass on to other members for questions. Mr Chanthivong, do you have any questions?

Mr ANOULACK CHANTHIVONG: Thank you, Chair. Thank you very much for your time to present to us, both in person and via videoconference. Ms Molyneux and Mr McCormack, you mentioned that a number of your fossil fuel plants were closing, in Camden—which is not far from where I am—and also Liddell and, of course, Bayswater. You also mentioned your big investment in renewables. I do not know if I missed it, but are those investments in the areas that are most impacted by the closures of your fossil fuel industries?

Ms MOLYNEUX: Can I clarify: When you said the "areas" were you talking about the State of New South Wales?

Mr ANOULACK CHANTHIVONG: I was talking about the Hunter, mainly, and also in south-west Sydney. There are employees who were once working in those power plants who, I suspect, will either be offered redundancies as it shuts down, or will be retrained and equipped. I just wanted to know whether AGL, through its investment in renewables, is trying to replace the jobs that were actually lost in the areas that were most affected.

Mr McCORMACK: If we focus on the Hunter first off, for example—and Liddell being the major operation that will close in 2023—we do have a real focus on energy replacement in the Hunter, firstly with the Newcastle power station project at Tomago, which is currently with the Department of Planning, Industry and Environment for assessment. We are currently undertaking geotechnical studies on the Bells Mountain Pumped Hydro project, also in the Upper Hunter. We hope to have that report back by March of next year. That would hopefully be ready to generate, all things going well, by 2026. Obviously, we have not given up, in terms of energy generation, on the Macquarie site itself—our scoping report that we lodged last month with the Department of Planning, Industry and Environment to build a major grid-scale battery project at the Liddell power station itself. I think I mentioned before, we are actively considering other energy projects in the Upper Hunter.

Mr ANOULACK CHANTHIVONG: If the Tomago, the geotechnical at Bells, and the battery grid proceed, do you know what is the net employment outcome?

Mr McCORMACK: It is a little bit hard to give you a definitive figure on exactly that number of employees. Obviously, as you would know, the difference between how many people you need for the construction of one of these different sites, versus ongoing operations—for example, I can tell you that we think at the peak of construction for our Newcastle power station project it would be approximately 300 jobs, and approximately 23 operational and maintenance ongoing roles, when that was complete.

Mr ANOULACK CHANTHIVONG: In terms of your current employees at a number of your plants that are about to close—in Liddell's case it has closed, or will close shortly—are you offering those employees support to potentially retrain to get jobs at your new operations or other investments that you are looking at?

Mr McCORMACK: Definitely. Firstly, there are no forced redundancies following the closure of Liddell. Impacted employees will be given the opportunity to undertake the training required for them to continue

in other suitable roles, noting that the Bayswater power station, which is effectively across the road from Liddell, will continue to operate until 2035. As I mentioned, we are considering a number of other energy generation projects onsite itself. There are a number of different retraining and skills services that we are currently offering our workforce: I think I mentioned résumé and job application training, information on career pathways, training courses, personal counselling, access to external job boards, career counselling services, and financial and superannuation support.

Mr ANOULACK CHANTHIVONG: Mr Murray-Leach, you mentioned a lot about retrofitting for both residential and business or government, which owns a lot of assets. How is that program done? That might be a policy response that you are suggesting, but is that actually being taken up either by residents or business and for the government?

Mr MURRAY-LEACH: It is a good question. I will start with the government—that is the simplest answer, because all the policies are laid out in public. There is the Government Resource Efficiency Policy from the New South Wales government, which is very well established, and there are similar programs in other countries around the world. In effect, what that is basically saying is, that the benefits of saving energy upgrading, for example, a hospital, or any department, tend actually not to accrue to the department; they tend to accrue to Treasury, because Treasury claws back the savings. There is relatively weak incentive to any individual department to go ahead with those. It has to be a whole-of-government program to drive those upgrades.

For example, effectively, what that would involve normally is, say, the health department is required to go out and do audits of its buildings, and invest in measures that deliver over a certain financial return—in Victoria it is 11 per cent internal rate return, so pretty attractive rates of return—as the requirement. What we have seen from a lot of those projects is, you are sort of getting somewhere between a 20 per cent to 50 per cent energy saving off them. My apologies if I use the Victorian data here, because they have published the most. They estimated, in Victoria, that the energy savings across the whole government—and actually more substantially, the maintenance savings that accrue from upgrading the facilities—would deliver about $2 billion worth of reduced energy and maintenance costs over the 10-year period, with around about $400 million worth of expenditure. Those are the sorts of figures we are talking about. What is particularly nice about that is it is a counter-cyclical investment, which is obviously very well suited to stimulus and other programs. That is being taken up.

The barrier in New South Wales—there are some programs that run very well. You generally need a few things in place. Without taking up too much time from the other very busy people appearing before the Committee, I can send you a report that explains those elements. But you effectively need four things for an effective program. The New South Wales program is very good. The only thing that is required is a stronger mandate on the heads of the departments, to actually look at their facilities, to identify the energy savings. That is the key part that is missing, but everything else is working very well in New South Wales.

In a household context, if we are talking about a retrofit, what we are generally talking about is that there are a lot of homes that have very leaky walls, floors and ceilings—they often lack insulation in the walls and ceilings—and outdated heating systems. I was midway through a retrofit of my home, because I did not get it done - because of the lockdown in Victoria - and I ended up getting mould. It is an issue, both in terms of temperature, but also mould and health. There are very substantial benefits. What they have found from New Zealand is that, with a program to upgrade homes there—where I think they have spent just shy of NZ$700 million over the last 10 years—they estimate that, for every dollar invested, it has delivered around $6, not even through the energy savings, but just through reduced health costs that the New Zealand government has to pay.

Those are the sorts of measures we are looking at. Realistically: for example, upgrading public housing stock, you are talking about something between $5,000 to $15,000 per dwelling. But as I said, there are benefits—if you ignore the energy savings—coming back, in reduced health costs.

The CHAIR: Thank you, Mr Murray-Leach. Mr Chanthivong, can I go to other members and come back to you?

Mr ANOULACK CHANTHIVONG: Yes, of course.

The CHAIR: Mr Griffin, do you have any questions?

Mr JAMES GRIFFIN: Thank you all for appearing today. We have heard a great deal of evidence and submissions from a variety of people in the Hunter. There has been a lot of enthusiasm for a lot of initiatives, big and small, but one of the consistent themes has been leadership and how these initiatives will be delivered, enacted and rolled out. One of the key pillars I have taken away from their commentary has been about local leadership. I am just interested to hear from each of you: Did you see a vehicle through which this should be delivered? Is there one that stood out immediately? How do we begin to encourage some of these initiatives to hit the road?

Mr HAWES: That is a very good question. Regions are very good at making strategies and then casting them out to the wild blue yonder, and hoping that the wind blows seeds back and they start to grow, but I think the difference in energy and the initiative that is happening at the moment is that they are world renowned. These are things that are bigger than just one region. From the Hunter's point of view, yes, local leadership could get people so that we are all singing off the same hymn sheet. That has always been an ambition, and at times we have done very well, and at other times not so good. But at the end of the day, and I will pick up the point that Professor Alan Broadfoot made, some of these investment decisions about what is happening are not being made locally. If they were, we would have had all of this stuff going 10 years ago, because they were such great ideas.

A lot of the finance or the big corporates that invest in these sorts of things, and that have to make the big muscle movements, are not going to be based in our region, but are going to want to understand it, and know how it clicks. The best way to do that is, obviously, to talk to locals. Hopefully, the locals are answering the questions that need to be asked, which are about what will stop investment going there, or what will constrain it, as opposed to saying, "Look, just come up here, because we have a wonderful lifestyle with nice beaches." That is not going to cut it. We have to get to the nub of having a solution, but also understanding the problem, so that that can happen; and so that we are not just all talking amongst ourselves, singing Kumbaya and feeling wonderful, but actually seeing nothing happen. That is the real challenge for us.

Mr McCORMACK: I guess in terms of leadership at AGL, as we said before we are very focused on what we can control, and what we can lead on our own side. But in saying that, we have been engaging with local councils, particularly Muswellbrook, Singleton, and the upper Hunter councils, but also the Hunter Joint Organisation in terms of the potential establishment of a Foundation. In principle, we would support such an initiative, and we would be very keen to work with the Hunter JO, which has been leading that work. We have also been working with the New South Wales government, through its Upper Hunter Futures Project, which we have been interviewed for, and we are sharing information with the project. The federal government also employed an employment coordinator in the upper Hunter last year.

In general, you are seeing - at all three levels of government - attempts to lead, and to lean into this transition. Could it be better coordinated? These things are relatively complex situations, and issues that you are trying to solve, in terms of economic diversification of an entire region. But, ultimately, we are keen to work with whoever is interested in providing that leadership.

Mr NATHANIEL SMITH: Thank you to everyone for attending and giving evidence today. A few weeks ago the Committee had three days of hearings and we heard evidence from different groups. Some of them provided interesting evidence. I will leave it at that. Obviously my area of Wollondilly is very similar to the Hunter. I have coke and coalmines; they have thermal coalmines. We have the wine industry and the equine industry. It is very similar to the Hunter in a lot of ways. Obviously my concerns throughout this whole inquiry is job creation and working with those other industries to retrain people if certain industries were to be phased out. Obviously, going back to what Mr Hawes said earlier, one of the key issues I have is that we have a lot of people from the city trying to tell regional areas how to run their show. We should be leaving it up to the local leadership who know the area better than anyone, and I had a case like down in my area.

We are different from metropolitan Sydney, like you in the Hunter are. Metropolitan Sydney is about 1,176 people per square kilometre; in the area of Wollondilly it is five. You have different business cases and different ways of running businesses in regional areas compared to metropolitan Sydney. I would just like to hear more from Mr Hawes as to what sort of things you are doing in the Hunter Business Chamber that will educate the metropolitan areas on how your region works?

Mr HAWES: Yes, that is the holy grail, is it not, to make sure that people get a clear understanding. First and foremost, the uniqueness of the Hunter region is never lost on me. We have a very strong community, but it is on the top of an energy and a coal chain, whereas in a lot of other parts of Australia, they are almost exclusively separated. In Queensland, the Galilee Basin is miles from anybody. Even in the southern coalfields, perhaps there was a time when they were more close. But in the Hunter, that presents enormous challenges for us, because we are all literally on top of each other. The opportunities that come out of that, as I have said, because we are diversified, is not singly about those particular industries in those supply chains. We have a strong defence industry that is existing and emerging.

A lot of money is being spent by the federal government to realise ambitions in people in defence in the country. Our biggest employers are across services, in education, retail, and things like that. We are not just reliant on making sure—well, our fragility goes beyond making sure that what we have in the industries that may experience change, as we did in the late eighties when we first got notification that BHP was going to be closing its steelworks. Small businesses did it. Guys who were heavy in manufacturing, those skills are still around. That has broadened their horizon, in terms of who they were training with, who they were supplying to, and who they

were doing business with. It was not successful for everybody. The decline in manufacturing in this region is no different to what has been experienced elsewhere in Australia.

We very much know that simple building blocks, to find strength and build on the industries we have, rather than trying to extract new ones in the first place. That is a much harder equation to do, because the ones that are here already understand our market, already understand our labour supply, our skills and how to do business here; whereas if you want to entice new businesses, or new industry, you are right back to square one. So it is a combination. There is a lot of work going on, as has been noted. We can always do more in that collaborative effort, and we are across some of those bodies and initiatives that have already been mentioned, as well as the Committee for the Hunter, which has recently been established to try and bring some of those organisations together, and we are members of that as well. It is not going to be easy. I am not imagining that it will be. It will not be quick; it will take time. We really see the government having a role, as has been said, as being part of that process, and not standing aside from it, but being part of it and working with people in the regions to get the outcomes that fulfil policy ambitions that the government may have, but also the real ambitions of the industries in the communities that are across the Hunter.

Mr NATHANIEL SMITH: I have a follow-up question to AGL. Earlier Mr Anoulack Chanthivong mentioned the coal seam gas wells in my electorate of Wollondilly and Camden. I know you have other projects up in the Hunter. One idea that I am working on with AGL and Sydney Water at the moment is to try to bring those 100 kilometres of gas pipeline to be used for recycled water, so that we can possibly droughtproof farms, dairy farms especially, in the Menangle and MacArthur areas with the west Camden sewage treatment plant. Do you have any ideas like that for the Hunter Valley for places that may be closing down in the near future and repurposing infrastructure to help farming and agriculture in the Hunter?

Mr McCORMACK: I guess the best example of that is the feasibility study that we are currently undertaking on the Bells Mountain pumped hydro project. For example, that is using old mining voids from the Muswellbrook coalmine, which is owned by Idemitsu in the upper Hunter, and ultimately—I will get in trouble from the engineers for saying this—it is a relatively simple concept, in that you need an upper reservoir and a lower reservoir, of which old coalmining voids are well suited, to playing that role. In that sense, I guess that is a tangible example of something that we are currently exploring. I cannot think of a project like the one we are investigating with you in Camden in terms of piping, but if anyone has ideas we would be happy to investigate them.

The CHAIR: Thank you all for appearing this afternoon. We may send you some further questions in writing. Your replies would form part of your evidence and be made public. Would you be happy to provide a written reply to any further questions?

Mr McCORMACK: Yes.

Ms MOLYNEUX: We would.

The CHAIR: Thank you all for joining us this afternoon. This concludes the public hearing for today. I thank all the witnesses who appeared before us and I thank my fellow Committee members for joining. I thank the wonderful team at Hansard for dealing with technology throughout the day, as well as staff from the Department of Parliamentary Services and our awesome Committee staff for helping us through the day.

(The witnesses withdrew.)

The Committee adjourned at 15:05.