



STATE DEVELOPMENT AND REGIONAL INDUSTRIES COMMITTEE

Members present:

Mr CG Whiting MP—Chair
Mr DJ Brown MP (virtual)
Mr JJ McDonald MP
Mr MJ Hart MP (virtual)
Mr RI Katter MP (virtual)
Mr TJ Smith MP (virtual)

Staff present:

Ms M Telford—Acting Committee Secretary
Dr K Kowol—Assistant Committee Secretary

PUBLIC BRIEFING—INQUIRY INTO THE IMPACT OF CLIMATE CHANGE ON QUEENSLAND AGRICULTURAL PRODUCTION

TRANSCRIPT OF PROCEEDINGS

Monday, 10 July 2023

Brisbane

MONDAY, 10 JULY 2023

The committee met at 10.30 am.

CHAIR: Good morning. I declare open this public briefing for the committee's inquiry into the impact of climate change on Queensland agricultural production. My name is Chris Whiting. I am the member for Bancroft and chair of the committee. I would like to respectfully acknowledge the traditional custodians of the land on which we meet today and pay our respects to elders past and present. We are very fortunate to live in a country with two of the oldest continuing cultures in Aboriginal and Torres Strait Islander peoples, whose lands, winds and waters we all share.

With me here today is Mr Jim McDonald, the member for Lockyer and the deputy chair. Via teleconference are Mr Michael Hart, the member for Burleigh; Mr Tom Smith, the member for Bundaberg; Mr Robbie Katter, the member for Traeger; and Mr Don Brown, the member for Capalaba, who is a substitute member for Mr Jim Madden, the member for Ipswich West. The purpose of today's briefing is to assist committee members to understand the programs, policies and strategies the Queensland government is supporting to help the state's farmers, graziers and agricultural producers adapt to climate change.

This briefing is a proceeding of the Queensland parliament and is subject to the parliament's standing rules and orders. Only the committee and invited witnesses may participate in the proceedings. Witnesses are not required to give evidence under oath or affirmation, but I remind witnesses that intentionally misleading the committee is a serious offence. These proceedings are being recorded and broadcast live on the parliament's website. Media may be present and are subject to the committee's media rules and my direction at all times. You may be filmed or photographed during the proceedings and images may also appear on the parliament's website or social media pages. Finally, I ask you to please turn your mobile phones off or to silent mode.

In today's briefing we will be hearing from representatives from the Department of Agriculture and Fisheries and the Department of Environment and Science. I now welcome participants from the Department of Agriculture and Fisheries.

CHAY, Dr Rachel, Chief Biosecurity Officer, Biosecurity Queensland, Department of Agriculture and Fisheries

HALL, Dr Wayne, Executive Director, Agri-Science Queensland, Department of Agriculture and Fisheries

MILLER, Mr Elton, Acting Deputy Director-General, Agriculture, Department of Agriculture and Fisheries

TURNER, Ms Lynne, General Manager, Horticulture and Forestry Science, Department of Agriculture and Fisheries

CHAIR: I invite you to make some opening remarks. After that we will move to questions from committee members.

Mr Miller: Thank you, Chair, and good morning, everyone. I would like to thank the committee for providing the Department of Agriculture and Fisheries the opportunity to speak to the impacts of climate change on Queensland agriculture. I, too, would like to respectfully acknowledge the traditional owners of the land on which we meet and pay my respects to their elders past, present and emerging.

Queensland's agriculture, fisheries and forestry sector is central to our economy, regions and communities. The whole of the value chain contributes over \$32 billion and employs over 374,000 people. Queensland producers continually show the world their innovation, adaptiveness and resilience in the face of biosecurity threats, market forces, community preferences, a global pandemic and a changing natural environment. Producers feel the impacts from climate change on their agricultural production through increasingly extreme weather events such as drought and cyclones, increased threat of exotic pests and diseases and heat stress impacting animal welfare, to name a few.

DAF helps administer the Queensland government's flagship Drought and Climate Adaptation Program—DCAP—which brings together the best climate scientists, government and non-government agencies, producers and industry leaders to work on cutting-edge research projects and partnerships. Starting in 2016, the program has delivered a range of applied research and development and extension programs to improve the capacity of primary producers to manage drought and climate variability and adapt to climate change. DCAP has successfully helped producers with decision-making.

Research is converted into information and decision support tools for farmers to use to respond to the highly variable Queensland climate. For example, in 2022 HortCarbon Info, an online tool for the horticulture sector, was developed to help producers better understand the on-farm carbon emissions associated with their operations. Additionally, DCAP's producer centred GrazingFutures project supports profitable and climate resilient livestock operations in Queensland.

As successful as DCAP has been for Queensland agribusinesses to adapt to climate change, DAF is now increasing its efforts in helping producers transition to reducing their production-based emissions. The world is moving to reducing greenhouse gas emissions and renewable energy targets, and Queensland is doing its part through the government's Queensland Climate Action Plan. It is important to recognise that individual commodity sectors are taking emissions reduction seriously and they have been developing their own industry emissions reduction strategies and targets. For example, the red meat industry has pledged to be carbon neutral by 2030 and Growcom has released their Hort360 climate risk management module. Consumers, international trading partners and broader supply chain businesses are also looking for verifiable ESG credentials.

The climate-positive Brisbane 2032 Olympic and Paralympic Games will be an excellent opportunity for agribusinesses to showcase sustainable food and fibre. To support industries' ambition for their decarbonisation efforts DAF, alongside QFF and AgForce, co-designed and released the Queensland Low Emissions Agriculture Roadmap earlier this year. The Roadmap is a 10-year plan to support industries work towards their own emissions targets through five focus pathways: livestock emissions, cropping and horticulture emissions, on-farm energy opportunities, carbon farming and landscape management, and regions and supply chains. An implementation plan is being co-designed and co-developed with QFF, AgForce and other stakeholders and will highlight the linkages between agriculture and other key government and industry low-emissions strategies such as the Queensland Energy and Jobs Plan, Zero Emission Vehicle Strategy and Land Restoration Fund. DAF is also heavily involved in the CRC bid for zero net emissions agriculture.

We also have leading scientists located in state-of-the-art facilities such as at the Spyglass Beef Research Facility, Gatton's horticulture smart farm, the Central Queensland Smart Cropping Centre, Ecosciences Precinct and Salisbury Research Facility for engineered wood products. DAF will use its network of smart farms as demonstration sites to showcase solutions and provide a hub for sector-wide outreach and local engagement. Some examples of current research into reducing methane emissions include the development of rumen biopolymer inserts into livestock for slow release of methane-mitigating compounds and new pasture varieties that reduce methane when grazed by cattle and sheep.

The method to market pilot program seeks to overcome the technical and economic barriers to grazer participation in ecosystem services markets while producing livestock. Practical pathways to reduce emissions across 26 grazing properties have been identified in South-West and Central Queensland. The program operates the Carbon Neutral Grazer Network, which provides independent and trusted information to over 600 members across Australia impacting 2.5 million head of cattle. Further, the Steak and Wood Pilot Program seeks to demonstrate livestock productivity and environmental service benefits of trees in northern systems.

In conclusion, Queensland's farmers and related supply chains are amongst the most innovative in the world. They have a long history of adapting and changing in response to changing conditions. DAF will continue to help them to adapt and change and mitigate the effects of climate change. We welcome the committee's questions.

CHAIR: You talked about the Drought and Climate Adaptation Program, DCAP, and you said there are a lot of cutting-edge programs and innovation generally that is featured as part of this program. Before I move on to other things, you mentioned briefly the GrazingFutures program. Can you tell us a bit more about that?

Mr Miller: It is certainly one that was set up fairly early on in the piece when DCAP was established and it was building on other work that we did. Dr Wayne Hall's team has been quite heavily involved in rolling out that program so I might pass to Wayne to give a bit of an update on what it has been doing and where it is at.

Dr Hall: The GrazingFutures program is part of our broader Farm Business Resilience Program, which is also part of DCAP. The FBRP, as we describe it, goes across all the industries within Queensland, and GrazingFutures deals specifically with our extensive livestock sector. As with all the others, we take a really holistic approach. Climate is one of the big risks that producers need to deal with, but they do that within the context of their overall business. That has been really critical to that.

Particularly in the livestock sector we adapt and use different strategies to what we might use with, say, the dairy sector or others. Very much in those more extensive areas there is a lot of small group work and one-on-one work to help support producers to deal with the climate variability they have at the moment and other risks. It may not surprise you that a large part of the same team who deal with extension around the reef water quality aspects are the same people who are dealing with the drought side of things.

CHAIR: That is one example of the initiatives you have within DCAP. Obviously you arrive at the end of the funding for that cycle. What are we looking at in terms of an extension or an embedding of this scheme into this program in your everyday work in the department?

Mr Miller: We certainly embed it across a lot of our work in the department. As I said, it commenced in 2016. It works across various parts of the department but not just within DAF. We work very closely with our colleagues in DES, the University of Southern Queensland and other member partners such as Meat & Livestock Australia and other parties that contribute funding to it. We have spent quite a bit of money investing in it, but it has leveraged a lot of additional funding as well.

At the moment we have funding through to 2025-26 at about \$2.5 million a year. That is known as DCAP stage 3. It has been ongoing because we have been getting very good results from the work we have been doing. As I said, there is about \$7.5 million of funding over the three years and that is leveraging another \$11.7 million in cash and \$19 million in kind from our project partners. It builds quite a large network of projects and work, and we have been trying to then link in closely with the Future Drought Fund—that is the federal fund—and the various drought and innovation hubs they have. We are working on continuing to coordinate with them and trying not to duplicate the work that is done.

CHAIR: That is important. There is obviously money from the drought fund and that is an example of the leverage. Obviously you want to work on different things and not replicate, but are you looking at partnerships in terms of that particular fund?

Mr Miller: Yes, we are certainly looking at that. As you said, we really do not want to be duplicating what is already being done. We would like the Future Drought Fund to build on some of the work that we are doing and we can also link with them.

Wayne mentioned earlier the Farm Business Resilience Program. That is another jointly funded program between the state and the Commonwealth. That is part of the Queensland government's drought reforms that have been implemented. Again, as an example of working through that, in 2022-23, 400 new farm business resilience plans have been developed by producers and 153 drought preparedness grants have been provided by QRIDA worth about \$4 million so that producers can be better prepared for the next drought rather than waiting until they are in the drought and then seeking assistance. We are really trying to help front-load those efforts and help producers be better prepared for things like drought.

CHAIR: It seems to be—and we have discovered this as we have talked with a variety of stakeholders across Australia—there is a great willingness to work together and leverage each other's funding to produce results, but the key to this seems to be partnerships, obviously using some funding as leverage. Those partnerships with the industry and other partners to produce innovation seem to be the key or one of the keys in dealing with climate change. Have I got that right?

Mr Miller: It certainly is, Chair. I might hand to either Wayne or Lynne and they might be able to provide some further information on some of those key partnerships.

Dr Hall: We have a whole range. Very rarely do we do work on our own. There is usually always a partner, be it a funding partner or a research partner, involved in the work that we do—just about everything. We have already mentioned DES as one of our key partners in the climate area—a key supplier of services to the department. One of the others is what we call NACP, Northern Australia Climate Program. I know that one of the people who provided some advice to you previously mentioned that. That is part of the DCAP program. It has linkages over in the UK, linkages with the Bureau of Meteorology and linkages with the University of Southern Queensland. It is some fairly

basic research trying to improve the forecastability of the global climate models that are being run, so some really fundamental research happening there, and we go right through to the more applied research.

We are talking about GrazingFutures, for example. We have partnerships there with Rural Financial Counselling Services. Partnerships are key in terms of both funding and delivery. The Future Drought Fund, as Elton said, is really critical from the point of view of providing funding through their Farm Business Resilience Program. We will be applying in the future to the ERF carbon outreach program to get additional funding to help support our extension activities in climate change going forward. It continues and it is really vital.

Ms Turner: Agri-Science Queensland within DAF is the largest provider of tropical and subtropical research, development and extension in Australia. We also provide a very important service to our Asia-Pacific partners through ACIAR funded co-invested work. An example that I would like to offer in terms of how our network and footprint is helping to accelerate action on climate change is through the bid for the cooperative research centre for zero net emissions agriculture. DAF has its own capability internally, and we have been deploying that to support our industries to adapt to climate through new varieties of different plants to reduce emissions on-farm, but we knew that we are a hard-to-abate sector and we need to leverage those partnerships that you were talking about, Chris.

Through our partnership with the University of Queensland, known as QAAFI, we were able to set them what we call the 'grand challenge', because we thought we are not going to achieve the types of cuts that we need to greenhouse gases by 2030 or 2050 in a hard-to-abate sector that is basically dealing with fundamental biological processes in the time frames required with business as usual. We need accelerated effort and we need the coalition of the best and brightest to assist us in this endeavour. Through that we have been able to get together 53 industry partners—groups like Elders and DLF and Barenbrug—10 universities across Australia and six state and territory governments. We heard just last week that we have been invited to stage 2 of that bid. That will still represent a fairly modest investment, in my view, given the magnitude of the task, but the only reason we were able to get that bid team together and that coalition of the willing in the time frames available is because of the foundational effort and networks and the capability that both DES and DAF have and have been able to retain in relation to climate adaptation and climate mitigation.

Mr McDONALD: Thank you very much for being here. We have been through a process of trying to gain a bit of capacity ourselves in understanding just how much work is happening out there. Ms Turner, I appreciate the comment about QAAFI, because I am very parochial about UQ and particularly Gatton and the smart farms out there but also the QAAFI industry.

What I have observed through the presentations from government as opposed to researchers and industry is that government areas are talking about the percentage of climate reduction and talking about changes in that aspect. If you go and talk to farmers about that you get into a political debate. What work is the department doing to bring those brightest and best minds into that industry conversation to be able to achieve great outcomes? There are many in the community who will understand the climate reduction targets, but there is a vast majority who do not. I see that we are relying on capital investment from the private sector and researchers to be able to get better outcomes. Farmers have always dealt with droughts and floods. What is the department doing to turn its mind to those aspects as opposed to just looking at some metrics around numbers or percentages?

Dr Hall: I agree with your concept that, basically, if you go and say, 'You have to reduce your emissions by 30 per cent'—the Queensland government KPI—'or the federal government's 43 per cent,' what we do not necessarily have is how you might actually do that. One of the big points that we try to get across is that it is not necessarily government policy that will be driving a lot of these things in future; it is the supply chains—the fact that we have Japanese companies coming here and inquiring about the emissions embodied in the products they are importing—so they need to look at their scope 3 emissions. That is going to be, I believe, the real driver in the short to medium term for a lot of our industry to say, 'It is not just a government policy that is going to be important here; the people who are buying our products are going to be requiring that they are low-carbon embodied products,' and eventually hopefully getting towards zero net emissions.

It is going to be a challenge, but we also have to have solutions so there is not just talk that we have to do this. We have to have some answers and some solutions around how they might do that. Depending on the industries, there are some obvious ones already. The horticulture industry is very intensive in terms of energy use—probably around 30 per cent or 35 per cent of a typical farm—so there are alternatives already in terms of solar, for example. When you look at extensive livestock, the beef sector for example, it becomes far more difficult when you are looking at methane, which might be 78 per cent of total emissions. There are some products on the horizon, but they also have

to be practical and cost-effective for producers to use. There is a lot of research. As my colleague said, the zero net emissions CRC is going to be one of those key vehicles from our point of view to help develop some of those solutions. I hope I have answered the question. Lynne might want to add something.

Ms Turner: I would just add that the Queensland Department of Agriculture and Fisheries has been a global leader in agricultural extension, which is really about driving practice change amongst landholders. What we have seen is that if you can upstream as much of the decision-making as possible, so it does not become yet another thing that producers have to think about, then that drives adoption and you get really good outcomes and you get those win-wins. While we have an agriculture sector in Queensland that is predominantly still dominated by small to medium enterprises and family owned operations, you cannot expect them to have the same wherewithal to engage in every policy imperative that is out there.

What we do know, as Wayne has indicated, is that those international and global market pressures and community expectations are that the sector does its heavy lifting in terms of mitigation but also addresses the adaptation, which all growers have been engaged in for quite some time now. I think it is really about generating those win-wins. We know that one person's nitrous oxide emissions are the producer's inorganic nitrogen input. If we can do things like use more forms of organic nitrogen and use only coded forms of inorganic nitrogen, we are going to be able to get quite high adoption rates, because it does not mean doing anything particularly special or anything particularly different but you are being guided through that process. I am particularly proud of the work that we do within Agri-Science Queensland within the department in supporting growers across a range of commodities to embark on that journey.

Mr Miller: I think the Queensland Low Emissions Agricultural Roadmap is a really good example of that, where government and industry have worked together coming up with some of the key options that could help reduce emissions. The implementation plan that is going to be worked up collectively with industry will guide the various things that we can do to help achieve some of the win-wins that Lynne is referring to but then to grapple with some of the more difficult tasks as well.

Mr McDONALD: I appreciate those answers, actually. I really do. Thank you for that. I think some of the funding programs that are available at the moment are designed to increase work and employment targets, which may not equate to climate variability. That might be a challenge for you to consider going forward. One of our witnesses talked to us about the real challenge of the lack of harmonisation between local, state and federal governments. You mentioned partnerships with DES. An example was a pig farmer who has methane that can be captured and burnt to produce power to get zero methane but who cannot get an approval through the local government because they go, 'That's methane. We don't want to touch it,' or words to that effect. What work is happening regarding the harmonisation of some of those things? Perhaps if it is not focused on that, there could be some consideration.

Mr Miller: Certainly we always, from a policy perspective, try to coordinate what is happening at a state, national and local level. From that perspective, I would acknowledge that we could always do better in, for example, the type of example you are raising around someone trying to get a good project up and there being various challenges and blockages. There is always more we can do to try to help coordinate those things to try to get the good outcome that is being sought.

Ms Turner: Our DES colleagues are also here and they are acutely aware that our regulatory framework and policy framework is not geared as well as it should be in terms of promoting and advocating for a circular economy. In the piggery example that you gave, there are very good and sound reasons for that, because we do not want fires on farms, but we do have an awful lot of work to do in terms of removing the barriers to those good and positive climate-friendly behaviours that we are looking for. I am sure that our DES colleagues will have information that they can share on those initiatives.

CHAIR: I will extend this session with DAF by 10 minutes.

Mr SMITH: Thank you to the witnesses who are before us today. With regard to climate change and adaptation, it can be difficult for farmers to change in the greater scheme of things. My question is probably a little bit more towards ways that different regions can capitalise on raw products by turning them into a value-add product. How much does the department investigate or undertake economic impact studies for different regions on the value in creating food-processing hubs that different growers can feed into so in a way they are increasing their profit but may be able to sustain themselves during those drought conditions or flood conditions that are brought on a little bit more

through the effects of climate change? I suppose the big question is: has the department undertaken economic impact studies for on-farm manufacturing and food-processing plants as hubs for the regions?

Mr Miller: I am not aware of specific examples where we have done that, but we certainly often take a whole-of-government approach in these matters and work with other relevant departments such as the department of state development and the Department of Regional Development, Manufacturing and Water on those sorts of issues. They will often get consultancies done on looking at the benefits and the costs of, for example, further value adding or food processing or, as was mentioned, some of the circular economy type approaches where one business's waste or excess produce can be another business's input. I am not aware of specific examples where we have done much, but we certainly work with other agencies in that regard.

Dr Hall: We have a food research centre out at Coopers Plains. While we have not necessarily done those regional analyses that the member was asking about, we certainly have worked with individual supply chains or farmers or farmers' groups in specific areas to try to look at the potential to value-add. We have a very good relationship with the North Queensland food manufacturing hub in terms of supporting some of the work they do up there around food security, particularly in some of the Indigenous communities. It is a really challenging area. It is one of those areas that has lots of opportunities, but to come up with a business model that is profitable and sustainable and has the scale to be those things is always very challenging.

Mr SMITH: Moving away from the value-add part, obviously during our inquiry we have spoken to private industry, advocacy groups and universities. There is a bit of a question around who leads research into climate change. Is there an element of DAF seeing themselves more in a supporting role where private industry is leading, or does DAF assess modelling and data and engage with private industry around particular matters? How do the representatives of DAF see their role within the agriculture sector? Is it more of a supporting role or a leading role?

Dr Hall: I would describe it best as situational leadership. In some areas we are leading; in some areas we are supporting. DAF and the Department of Environment and Science have a long history in terms of climate change research, including myself, going back to the early 2000s. Through different machinery-of-government changes, groups have come in and out of various departments including the department of natural resources, the department of minerals and mines and the Department of Agriculture and Fisheries.

The Queensland government has a long history in terms of leading different aspects of the research. From a government point of view, DES certainly leads the basic climate science area—the downscaling, for example. We would see ourselves as helping to lead the area with our various research partners. It is always partnerships, as we have said, around the 'so what?' question: 'So what do we do now in terms of the emissions side of things?' The CRC will be a key platform in delivering the research that is needed, because it coordinates that research across so many partners as well. There will be aspects within the CRC that we will lead, there will be aspects where we will support other groups and there will be aspects which we will leave to other groups to do completely. It is very much situational.

Mr HART: Has the department done any work around soil carbon sequestration? Is it part of the climate adaption program or the Northern Australia Climate Program?

Dr Hall: Probably the most significant piece of work that has been done by the department most recently in terms of soil carbon sequestration is that we commissioned a review around the potential for northern grazing lands, not just across Queensland but across the Northern Territory and the top half of Western Australia. That was done by Professor Beverley Henry, who was formerly with DNR and now I think is currently an adjunct professor with QUT. That is a really good base document in terms of what the evidence tells us. If you go back over the previous period, the Department of Environment and Science, DAF and the department of natural resources and mines did a lot of work previously around soil carbon potential, and we continue to look at the potential that is there. It is fair to say that the review found that the potential for soil carbon sequestration in most of our grazing lands is modest at best, so you need to be doing something very different in terms of land use change to generate the increase in soil carbon that a lot of people are looking for.

Basically, our soil determines how much carbon can be held. The really big driver above the particular soil type is the amount of rainfall we get. Rainfall drives the inputs that plants provide into the soil, so if we have a run of good years, as we had recently, we get increased pasture growth and more below-ground soil carbon being produced and deposited. At the same time as we have a dry run of years, you will see that soil carbon being metabolised by the microbes that are there and the

soil carbon will reduce over time. There is a rough equilibrium there. With any given climate, that will be what is in place. The Wambiana grazing trial, which is just outside of Charters Towers, provides a very unique way to look at the impacts. It has been going for almost 25 years now. We can look at the long-term impacts of different management strategies on soil carbon as an example of what is potentially able to be done there.

Mr HART: Does the department pivot when it finds something does not work, or are there any thresholds that have to be met before it pivots away from those sorts of ideas?

Dr Hall: From our point of view, being a research-based group, something has to be statistically significant. You can get variations but—depending on the number of measurements you take, the number of samples you take—we are looking for scientific validity. From our point of view, the benchmark we use is that we can publish this information and it will withstand scrutiny from not only our own internal colleagues, our departmental colleagues, but also the broader scientific community.

Mr HART: A few people have commented about the keenness on parametric type disaster insurance. Can you tell us if your department or any of the other government departments have talked to insurance companies, banks, mutuals and people like that to try to increase the development and uptake of that sort of insurance policy?

Mr Miller: Yes, we have. It was through DCAP that the initial work being done on parametric insurance was progressed. We will keep looking for opportunities to apply that research. We have been working collectively through the DCAP looking at parametric insurance and other insurance methods to try to manage climate change, other disasters and things like that.

Mr HART: Are you the lead department in that?

Mr Miller: DCAP is the lead entity that is running with it so in that respect, yes.

CHAIR: Member for Burleigh, we might even write to the department and ask for more information on that, because I know we could spend an hour just on that particular topic. Would it be all right, member for Burleigh, if we officially wrote to the department asking for more information about that?

Mr HART: Yes, I am happy with that.

Mr Miller: We would be very happy to write a response to summarise where things are at, yes.

Mr KATTER: The member for Burleigh's question is a good segue into mine. Prickly acacia is the most obnoxious woody weed in Australia. If the tree canopy gets up to 50 per cent then there is zero per cent Mitchell grass. Notwithstanding those things you said before, that the impacts are negligible, it is pretty significant that fresh grass species come in where you clear prickly acacia. I know that I have had meeting with officers about the prickly acacia mob that want to convert them to a fuel source which, I am told, is net zero. That should trigger a pretty significant opportunity for agriculture when you are talking about a 20-million-hectare infestation of prickly acacia. What is your response to that? To me, that is a pretty big opportunity staring us in the face right now.

Dr Hall: Yes, there have been a number of schemes or proponents or opportunities put forward around the prickly acacia or more generic woody weed concept and using them for the production of biochar, carbon sequestration and so forth. Technically, they are feasible. The challenge is always around it being economically feasible. That has been the biggest obstacle to getting those schemes up and running.

Mr KATTER: This one is a pilot that is up and running. Talking to the likes of Glencore, this one is not just talk; they are meeting with your officers. They are going privately to get some work on sequestration. I would have thought that is the sort of thing that would be done through this channel rather than them having to do it privately to prove up that this stuff works and it does do that. Wouldn't there be an opportunity for your department to value-add in that space?

Mr Miller: We will certainly find out a bit more about that project and have a discussion with them to see where it is at.

Dr Hall: If they are producing biochar, the carbon contained within that biochar is extremely stable. That is a sink, basically, of carbon. That is a given, and that is sort of fairly well determinative of how much carbon would be contained within that biochar.

Mr KATTER: Yes, I accept that. It was the fact that I had a discussion with the person who is operating this now. They have the plant in Richmond up and running. When I asked where they were with sequestration, they said they were still after some confirmation. If that is viable, then it is 20 million hectares. It is a pretty big multiplier, even if, as you were saying, it is smaller numbers for the grazing lands with lower rainfall. By virtue of the sheer volume, I think we are talking pretty big numbers and pretty big potential.

Mr Miller: We will reach out to them.

CHAIR: Member for Traeger, once again we will write to the department and ask them about this project, especially with reference to sequestration potential. How would that be, Robbie?

Mr KATTER: Yes, I would be happy with that, thanks.

CHAIR: We will resolve that in a private meeting afterwards.

Ms Turner: We would also seek leave to table some documents that we believe would be useful to you. We have a copy of Professor Beverley Henry's report. We also have the marginal abatement cost curve which the department commissioned in 2019 to identify opportunities to reduce carbon emissions in the agriculture sector. We also have a little bit more information about the work that Agri-Science Queensland undertakes.

Mr Miller: I also seek leave to table the Queensland Low Emissions Agriculture Roadmap and the draft Queensland AgTech Roadmap.

CHAIR: We will table all of those and they will be shared electronically with our members. We will probably get you back in September. We have not talked about the Long Paddock, NCAP Climate Mates or biosecurity and telecommunications services, so we will probably get you back in a couple of months and get some more information about those. We will call for submissions as well. Thank you very much to all of our representatives from DAF.

GRAHAM, Ms Alex, Executive Director, Landscapes, Water and Natural Capital, Department of Environment and Science

KALSI, Mr Gobind, Director, Climate Change Strategy and Accountability, Climate Action and Sustainable Planning, Environment and Heritage Policy and Programs, Department of Environment and Science

PUTLAND, Mr David, Principal Scientist, Climate, Biodiversity and Information, Department of Environment and Science

CHAIR: We will also extend this session by 10 minutes. I invite you to make some introductory remarks. Then we will move on to questions from committee members.

Ms Graham: Thank you for the opportunity to appear before the committee today and assist with its inquiry into the impacts of climate change on Queensland agricultural production. I would like to make a brief opening statement, but first I would like to respectfully acknowledge the Turrbal and Yagara people, the traditional owners of the land on which we meet, and pay my respects to their elders past, present and emerging.

The Queensland climate has always been highly variable. As a result, the agriculture sector has had to adapt to thrive while remaining competitive. Queensland's agriculture sector is already working to manage the risks associated with climate change including changes in the frequency and intensity of droughts, floods and other natural disasters. For decades the Queensland government has supported the agriculture sector's climate resilience and sustainability through the development of applied tools, the delivery of information and risk profiles, and access to climate modelling specialists. I will brief the committee on some of the key initiatives relevant to the Department of Environment and Science that are supporting the sector now and into the future.

In 2017 the Department of Environment and Science released the Queensland Climate Adaptation Strategy 2017-2030. Under the strategy the Agriculture Sector Adaptation Plan was developed with industry, including the Queensland Farmers' Federation and AgForce, in relation to climate adaptation for agriculture sectors on continuous improvement in the capacity of farmers to deal with a changing climate and ensuring the necessary tools are available for informed decision-making and adaptation activities.

In 2021 the Queensland Climate Action Plan 2020-2030 was released. The Climate Action Plan retained the Queensland Climate Adaptation Strategy. The Climate Action Plan is supported by the Queensland future climate science program that delivers: localised, high-resolution climate projections; spatial mapping of climate parameters such as rainfall, evaporation and heat; and resource materials, tools, fact sheets and training to support climate risk management on the Queensland Future Climate Dashboard.

The Queensland future climate science program is currently updating its high-resolution climate projections on the dashboard to include updates using the latest global climate models whilst engaging nationally with other modelling groups and end users to support a road map for nationally consistent climate projections. The dashboard is hosted on the Long Paddock website, which also provides some of the most advanced climate science resources in Australia to support the agriculture sector to improve decision-making in a variable and changing climate. As some of the members on the committee would know, the Long Paddock has become somewhat of a brand amongst the agriculture industry to locate and use relevant information, both for short-term and longer term property-based decisions.

The Department of Environment and Science is a key partner in the Queensland government's Drought and Climate Adaptation Program, which is managed by the Department of Agriculture and Fisheries, to help farmers better manage drought and climate impacts. The Drought and Climate Adaptation Program provides services to help producers manage the risks associated with droughts and climate variability through improved forecast products, decision support tools and extension activities.

There has also been significant investment in supporting sustainable agriculture. As a result of its first investment round in 2020, the Land Restoration Fund currently has contracts to the value of around \$87.7 million for 16 projects to deliver over 1.7 Australian carbon credit units. The projects will

deliver verified outcomes for the Great Barrier Reef, wetlands, threatened species and ecosystems as well as support farmers and First Nations people to diversify their income and create jobs in their local communities.

The Queensland government has allocated \$45 million towards the Queensland Natural Capital Fund, which will kickstart environmental co-investment between government and the private sector to support investment in Queensland's environment, receiving returns from sustainable agriculture, carbon and other environmental markets whilst boosting environmental and socio-economic outcomes.

The Queensland Climate Action Plan commits Queensland to net zero emissions by 2050—in line with leading global economies—and an interim target of at least 30 per cent below 2005 levels by 2030. The Climate Action Plan also sets out the priority sectors for emissions reduction action over the next decade, including the agriculture sector.

In March this year the Queensland government released the Queensland Low Emissions Agriculture Roadmap 2022-2032, which was co-designed by government and industries and outlines five pathways to help lower agriculture emissions. As you previously heard, the Department of Agriculture and Fisheries is delivering this road map. The road map seeks to support industries in the agriculture sector to set and deliver against their targets and work towards the government's commitment of a zero emissions economy by 2050. The Queensland Agriculture and Food Research, Development and Extension 10-Year Road Map and Action Plan will work alongside the Queensland Low Emissions Agriculture Roadmap to encourage innovation in response to climate change, climate variability and other sustainability issues.

The shift to a low-carbon future presents significant opportunities for Queensland's land and agriculture sector and its supply chain to deliver productivity, profitability and environmental benefits. The Queensland government, in partnership with industry, is already acting to reduce emissions in the land and agriculture sector, providing opportunities to store carbon in the landscape and restore natural systems and supporting the agriculture sector to assess and manage current and future climate risks.

Mr McDONALD: Thank you all for being here today. I think you were in the audience when I asked the Department of Agriculture and Fisheries a similar question. One of our witnesses was very concerned about the circular economy and the harmonisation of local, state and federal policies and regulations. What work is being done in that space? There is a very complex understanding of what local, state and federal governments can do. I would appreciate your response.

Mr Kalsi: I might be able to provide a partial answer to that. Earlier in the year there were amendments made to the Environmental Protection Act and the Waste Reduction and Recycling Act 2011. As part of those amendments, changes were made to the objectives of the Waste Reduction and Recycling Act 2011. Two insertions were made: first, to promote and facilitate Queensland's transition to a circular economy; and, secondly, to promote activities across government, business, industry and the community that extend the life cycle of products and materials. There were two additions that were made to the objectives of that act along with other reforms to that act and the Environmental Protection Act. If there are more specific items that you need in that area we could take that on notice, but reforms have been made to regulations to facilitate the circular economy in Queensland.

Mr McDONALD: I appreciate your response. I will give the example of the piggery with waste products and methane and the challenges it has with regard to making use of that energy. I appreciate and respect your previous answer that we do not want things to catch fire, but this is something that has been pretty well globally recognised and can be done. It is just about the coordination and licensing of regulation and approvals.

Mr Kalsi: I think regulatory approval is a challenge where there seeks to be alignment between Commonwealth, state and local governments. It is an area where the department remains focused on seeking streamlining opportunities, and I think the amendments to that act speak to those efforts.

Mr McDONALD: One of the things I am really concerned about with this inquiry is the lack of understanding in agricultural communities around the targets that scientists will be striving for, because as scientists you have to have a measure. What work are you doing to turn your mind to more industry understood or beneficial outcomes and productivity as a driver so that both can be met?

Mr Kalsi: I think it is worth bearing in mind that in the opening comments there was reference to the Queensland Climate Adaptation Strategy. Under that strategy is also the Agriculture Sector Adaptation Plan. That was developed in partnership with the Queensland Farmers' Federation and

AgForce. One of the items that was identified as part of delivering that plan was that climate adaptation and climate risk should just form part of a business-as-usual risk for industry. That is where that plan is driving to work in partnership with industry to make it not a burden but as part of a business-as-usual step.

Mr Putland: In addition to emissions work we also have a clear role in helping farmers understand future climate hazards and risks and what kind of adaptation measures might need to be in place. That is where our Queensland future climate science program comes in, to provide a comprehensive set of information to really help not just farmers themselves but also industry bodies and other advisers understand future climate hazards and take appropriate decisions. We are keen to work with those industry bodies and farmers directly as well in that area about informing adaptation plans.

Mr McDONALD: Alex, I am pleased that you mentioned the Long Paddock, because that is a great resource. We were really encouraged to hear that BoM is investing in agriculture-specific areas. QUT also gave us a briefing about flux towers, which are essentially a climate station at a location that can measure real-time impacts within the community. What work is the department doing to assist farmers to interpret each of those different things so they can provide a cropping or grazing system that will be an economic development driver whilst also being prepared for climate variability?

Mr Putland: That is not my field, so I might have to take this on notice if you do not mind. There is a paddock to reef program within the Department of Environment and Science that does a lot of that work, including with flux towers, to get a better understanding of what kind of on-farm activities have an influence on emissions and then feeding that back through to industry players as well.

Mr McDONALD: I really appreciate those answers. In light of the time, I will just make a closing statement. When the government suggested this inquiry I immediately understood the challenges that industry would face. That has been a real concern for me. I appreciate the answers you have given, but I really want people to understand that we are not just doing an audit of what is going on; we want to make sure that any investments that are made can be operationally understood and replicated.

Ms Graham: Absolutely.

CHAIR: I think we can probably write to you to get more information about the paddock to reef program, because it includes information about those towers onsite. I would just make the general statement that the work is going on. Everyone is partnering and working closely with each other to produce the information, the practices and the programs that make a difference. Clearly you are one of the partners that is working with all of the other ones we have talked to previously; would that be right?

Ms Graham: Yes.

CHAIR: Within the future climate science program, information is used for the Long Paddock initiative; have I got that right?

Mr Putland: That is right. The Queensland future climate science program is a partnership between DES and the University of Queensland. We are producing that dynamically downscaled future climate information. It is essentially done in-house in DES. We are one of four major climate modelling organisations in Australia—CSIRO, Bureau of Meteorology, Queensland government and New South Wales government—and a spattering of universities as well. It is a significant piece of work to provide that information.

That dynamical downscaling process, we're taking the global climate modelling outputs which are usually on a 100 x 200km grid resolution which isn't terribly useful when looking at fine scale regional variation.

Our science program runs a dynamical downscale process that turns that into a roughly 10-by-10-kilometre grid that is far more useful. Within that range of data outputs we have 42 different climate variables, including a lot that are directly relevant to agriculture—so extreme events, extreme temperatures over certain thresholds, extreme rainfall. We have drought indexes on there as well for two different emissions scenarios at four different time horizons, so we have information there available to support decision-making. All of this is available by a product we call the Queensland Future Climate Dashboard. It is free and publicly available. Anyone can get on to the dashboard and explore future climate data down to the local government area, so it allows that really fine-scale way of exploring that data and obtaining information in different ways to suit what you are after, whether it is detailed risk assessments or you are just wanting to get a rough picture of what something might be in a couple of decades time to inform some farm management decisions. All of this kind of information is readily available.

We are stepping up efforts, though, on engagement—working with other government agencies, local governments and NRM groups, for example, in helping them navigate and interpret the climate data we have available and also getting more information from them about how we can improve our products as well to make sure they are useful to inform those long-term adaptation decisions. It is worth noting that there are other resources as well, so the Queensland government is not alone in providing these sorts of things. The Commonwealth in particular is developing an Australian Climate Service. That emerged from the Royal Commission into National Natural Disaster Arrangements. The primary customer for that is DCCEEW, the Commonwealth agency for their national climate risk assessment, and also the National Emergency Management Agency for emergency management arrangements, but that information is likely to be useful in other areas as well. The Commonwealth also has its Climate Services for Agriculture, which is also shaping up to be a very useful tool in its ability to provide more targeted agriculture-specific information, which is a little bit different.

The approach we have taken for the Queensland science program is: we provide a range of variables in different formats that allows third parties to then tailor those to suit particular industry perspectives, so we have industry bodies. For example, the Rural Research and Development Corporations have the capacity to produce—and they have those direct connections with industry—more tailored information products. The Climate Services for Agriculture service is going further down that path in producing distinctly agriculture focused outputs that will be really useful. One of the areas is in terms of turning these into useful products for informing decision-making. Again, there are other organisations involved in that space. The Rural Research and Development Corporations is a major one there. That level of engagement on climate science has varied over the last 10 to 15 years, but there are plenty of opportunities for those organisations to be more involved and, again, provide a really specific subsectoral focus on what is required for that sort of information.

CHAIR: I think one of the key words there was 'engagement'. Clearly there is a lot of innovation and information being created through partnerships and it is how we engage with the people on the front line, and there is certainly the creation of trust. The member for Burleigh has talked about trust regarding BoM, but, certainly once you create a product that is trusted, trust seems to be the key with implementing all of the innovations and information and programs that we create. Would that be correct?

Mr Putland: Yes.

CHAIR: Especially dealing with the agricultural sector. Once you get something that they really trust, that is the crucial bit.

Ms Graham: Absolutely.

Mr Putland: Yes, absolutely, and that is where we have products like Long Paddock, which has been around for a long time, and the partnership through DAF that provides for us that link to industry perspectives as well. The Long Paddock is what hosts our Queensland Future Climate output, so we are able to build on that longstanding trust with the Long Paddock resource around the future climate data, so it is a really important aspect.

Mr HART: Just on the Climate Resilient Councils program, I understand that there are a lot of Western Queensland councils that did not participate. I wonder if the department can enlighten us as to why that would be the case and what it is doing to try to rectify that?

Ms Graham: Are you aware of that matter?

Mr Kalsi: I am aware of that program. In terms of the precise councils that are yet to participate in those and the reasons, I would have to take that on notice.

CHAIR: Did you want us to chase that up, member for Burleigh?

Mr HART: Yes, if we could. I am just interested as to why. I understand that the website says that a lot of western councils did not participate and I am just wondering why that would be the case.

CHAIR: We can ask. It would be hard for them to speak on behalf of those councils, but we will make a note to chase that one up.

Mr Putland: I could make a quick comment on that, based on previous work in the different group within DES. That program was opt-in, essentially, for councils' preferences, so there were a limited number of spaces originally. I think it was 32 councils in the first round, so that was fully subscribed, and then there have been subsequent rounds where it has been expanded. Unfortunately, I cannot tell you the numbers off the top of my head and dates, but it has been up to the councils themselves to put themselves forward and partake in the program.

Mr HART: Okay.

CHAIR: Do you have another question, member for Burleigh?

Mr HART: No, that is it, Chair.

CHAIR: Thank you. I do not know if we still have Robbie on the line, but, member for Traeger, do you have a question? No?

Mr McDONALD: I think we lost someone.

CHAIR: Yes, I know. Do we have any further questions, member for Bundaberg or member for Capalaba?

Mr SMITH: I have a quick one, Chair. Thank you to everyone from DES who is here today. I was just wondering if I could be a little selfish and ask DES what kinds of current activities or study or engagement with our local growers it is undertaking in the Bundaberg region. I am happy for them to take that on notice if it is not at hand.

CHAIR: Would anyone like to try to answer that one?

Ms Graham: I think it is probably better that we take that one on notice, if that is okay. There is certainly a lot of activity going on in the Bundaberg region across a range of our programs. Is the context specifically supporting the agriculture sectors up there in adapting and transitioning or more broadly?

CHAIR: Would that be right, member for Bundaberg?

Mr SMITH: With our agriculture and horticulture industry, yes. That would be great.

CHAIR: Adaptation, resilience—those things?

Mr SMITH: Yes.

CHAIR: Okay.

Mr McDONALD: I just noticed that question about the water modelling network and what work has been done to support that Queensland water modelling network by DES.

Mr Putland: Again, sorry, it is not my field, so we might need to take that one on notice as well.

CHAIR: Sure. Thank you very much for that. That concludes the public briefing. I ask members of the committee to stay online while we have a quick private meeting afterwards to resolve to write and ask about that. As I said, that concludes the public briefing. Thank you to all of the departmental staff, to our secretariat and also to Hansard for being a part of this today. We will resolve to ask you some questions and I ask that we get those answers by Monday, 24 July. Thank you once again. I declare this public briefing for the committee's inquiry into the impact of climate change and variability on Queensland agricultural production closed.

The committee adjourned at 11.38 am.