PRIMARY INDUSTRIES AND RESOURCES COMMITTEE

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Mr NJ Dalton MP
Mr RI Katter MP
Mr GR Kelly MP
Mr JR Martin MP
Mr TJ Smith MP

Staff present:
Dr A Ward—Committee Secretary
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PUBLIC HEARING—INQUIRY INTO SUGARCANE BIOENERGY OPPORTUNITIES IN QUEENSLAND

TRANSCRIPT OF PROCEEDINGS

Wednesday, 19 November 2025

Brisbane

WEDNESDAY, 19 NOVEMBER 2025

The committee met at 9.00 am.

CHAIR: Good morning. I declare open the public hearing for the committee's inquiry into sugarcane bioenergy opportunities in Queensland. My name is Steve Bennett. I am the member for Burnett and chair of the committee. With me here today is: James Martin, the member for Stretton and deputy chair; Nigel Dalton, the member for Mackay; Glen Kelly, the member for Mirani; and Tom Smith, the member for Bundaberg. The member for Traeger, Mr Rob Katter, will join us later in the morning.

This hearing 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 are reminded that intentionally misleading this committee is a serious offence. I also remind members of the public that they may be excluded from the hearing at the discretion of the committee, and these proceedings are being recorded and broadcast live on the parliament's website. Media may be present and are subject to the committee's 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.

I kindly ask all witnesses and observers who are also attending the Unlocking the Pipeline Workshop in the Speaker's Hall to be respectful when exiting the room. Please note that the workshop is located on the next floor down, on level 4 of the Annexe. Please remember to press your microphone buttons on and off to speak, and please turn your mobile phones to silent.

SALARDINI, Mr Ash, Chief Executive Officer, Australian Sugar Manufacturers

CHAIR: Good morning. Would you like to take this opportunity to make an opening statement? I thank everyone for coming this morning. We have found this inquiry to be very fulfilling and important, and we are continuing our work and our deliberations as we work towards our final report. Over to you.

Mr Salardini: Thank you, Chair. I thank the committee for giving us this opportunity to talk about this very important issue. I am here representing the Australian Sugar Manufacturers, which is part of an industry that supports 20,000 regional jobs. Today, this committee has a real opportunity to set a course for the government that will ensure the long-term success of the sugar industry as the bedrock of regional Queensland communities. Biofuels and bioenergy are the answer.

Sugar can produce around 30 per cent of Australia's aviation fuel needs. Cogeneration from bagasse can power half a million Queensland homes. It can provide affordable biogas to regional manufacturers and replace coal to make steel production green with renewable pellets made from sugar by-products. We have nearly 4,000 kilometres of cane rail and we can aggregate feedstocks across agriculture and forestry to establish scalable bioenergy precincts across regional Queensland. In doing so, we can create new revenue streams for growers through tops and trash.

Imagine places like Bundaberg, Childers, Mackay, Ingham and Tully being hubs for energy production and biomanufacturing. It means jobs, jobs, jobs. This is about revitalising regional economies, and a by-product just might mean that we can have an affordable and reliable energy transition. However, we have significant challenges. Viability in our sector is under threat. Seven out of 13 mills we analyse now operate above global sugar prices—prices that have been heavily distorted by subsidies to places like Brazil and India. Just as China has gone all-in on cornering the market for steel production, Brazil and India are trying to corner the markets for sugar and biofuels.

Australian governments have intervened in other industries to protect against these challenges, yet a strategic approach to sugar is lacking. Mill closures are not inevitable; however, unlike past closures, the next may leave growers with no viable option to process their cane, and this will be a regional crisis for the affected communities. Diversification to biofuels and bioenergy is the solution to these challenges. This will only happen if government and industry work hand in glove.

The markets for biofuel do not really exist at the moment and are contingent on government policy. The capital costs are significant and the risks are high. That is why we are calling for the government's collaboration, and that is why it is an absolute necessity. We are also calling for a sugar industry strategy from the Queensland government. This strategy should explore: funding to drive bioproposals to final investment decision and to the front of the queue for federal funding; co-investment in sugar manufacturing R and D and cane growing infrastructure; and offtake agreements for cogeneration to recognise this renewable's baseload benefits. Finally, this agenda requires the supply of cane, and the ASM is 100 per cent supportive of measures put forward by grower representatives to increase that supply. The replacement value of the sugar manufacturing sector is close to $20 billion, so let's use it before we lose it. Thank you.

Mr MARTIN: It is good to see you again, Ash. In your submission, you note that the existing sugar market returns for growers in Queensland are strong and that the first generation bioenergy uses of current cane rarely surpass those returns. What specific policy or market levers would you propose that the Queensland government introduce to increase returns on bioenergy?

Mr Salardini: My first point of clarification is I would not say it is strong. The returns for either manufacturer or grower are not strong. I think the return on investment is around three to four per cent, which in any other industry would not be considered strong. It is stronger than what you can get for ethanol, though.

What we need is that long-term certainty. In the current market, particularly for alcohol-to-jets, ethanol is not paying the returns that sugar provided over the last three to four years; however, with demand-side incentives and with supply-side incentives we can actually get there. It takes a couple of steps to get there. If you have supply-side incentives without projects, you are not going to have a lot of uptake.

What we need is some help, some collaboration and some co-investment in things like prefeasibility, feasibility and final investment decision analysis as a first point. The next one is around some sort of national scheme or mandate around biofuels, and that will create the demand, which will create the revenues and the returns for both growers and manufacturers.

Mr MARTIN: To clarify: essentially the Queensland government part of it is investing in prefeasibility studies?

Mr Salardini: It is, from prefeasibility to feasibility to final investment decision. We need to have shovel-ready projects to take to the federal government, basically.

Mr MARTIN: Do you have an idea about how many that would be?

Mr Salardini: First of all, the cost of that would probably be, in total, four to five million dollars, so let's split that between industry and governments. You would probably need to do five or six, and that would be the proof of concept. There is a first-mover disadvantage here where you take all of the risk and all of the cost. That help would first of all get you over that line and then the next step would be you prove the concept so that others can follow your lead.

Mr MARTIN: The second step then, after the feasibility studies or at the same time, is to work on a national strategy. Is that what you are saying?

Mr Salardini: Yes. First of all, the federal government has announced the national $1.1 billion Cleaner Fuels Program, which is going to be a combination of credits and direct investment. If Queensland proponents and the Queensland government can get a few projects shovel ready, that will put us at the front of the queue federally to actually get significant investment from the federal government.

Mr DALTON: Countries like India and Brazil heavily subsidise their sugar industries, treating them as sovereign capabilities for food and fuel security, while the US and EU erect significant barriers, denying access to Australian sugar. Can you elaborate on that, please?

Mr Salardini: Let's start with Brazil and India. They are by far the largest producers of sugar in the world, and Brazil is by far the largest exporter of sugar. They both have a strong biofuels industry. That did not happen overnight, and that did not happen without significant government investment.

First of all, both countries have significant mandates for biofuels and ethanol. Brazil started with around a 20 to 30 per cent mandate. The other thing that Brazil did was put an import tariff of around 17 to 18 per cent on imported ethanol, so that gave their ethanol industry the opportunity to get established. On top of that, they have green credits as well for fuel.

Brazil has become a superpower in both sugar and biofuels not because of some sort of competitive advantage or natural advantage; it was because of government strategy for fuel security primarily. Their sugar industry is a dual-use industry where they can shift between making sugar and making biofuels. In doing so, they can game both markets to get the prices they want, depending on the supply they have. India has followed a very similar path as well. They have mandates in place and concessional loans, and there are 150 per cent subsidies to producers off the cost of production.

This is the issue we have. We have been told particularly by the federal government, 'It's free trade. We don't help industries. Go forth and operate in a free market,' but we do not operate in a free market. If we do not have a consistent strategic approach to this, we will de-industrialise Australia, and regional manufacturing is the canary in the mine. You can see this in the steel industry, and the sugar industry will not be far behind if we do not do something differently.

Mr SMITH: Ash, thank you for being here. You said before that the sugarcane industry could supply 30 per cent of Australia's domestic aviation fuel needs. Is that just straight aviation fuel or sustainable aviation fuel?

Mr Salardini: That is straight aviation fuel for the domestic market.

Mr SMITH: What is the current volume of aviation fuel use in Australia?

Mr Salardini: I think it is about six or seven billion litres.

Mr SMITH: What volume of cane would need to be crushed each year to hit 30 per cent?

Mr Salardini: That figure comes from the use of sugar and molasses. We are using the 30 million tonnes we currently have and the nine to 10 million tonnes of bagasse that we have—the biomass. If we convert that, that is the size of the prize. I am not necessarily suggesting that we will do that, but we have the potential to do that.

Mr SMITH: Is that potential only if the use of sugar goes towards fuel use?

Mr Salardini: Around half of that would be sugar and then the other half would be biomass and molasses.

Mr G KELLY: Good to see you, Ash. I am all about baseload reliable energy. I have always had my concerns about intermittent power such as wind and solar. One of the things that I have followed very closely and noticed is the impact of wind and solar on communities, neighbouring properties and other different things. When it comes to cogeneration, have you found that moving forward there will be less of an impact on or a more aggressive impact to neighbouring properties and communities?

Mr Salardini: There are a couple of layers to your question. The first one is around what it can do for regional communities, neighbours and others. First of all, I think there is a social licence issue with some renewables in the sense that they are coming in as a new industry and potentially someone who has moved into that regional area did not want to live next to an industrial process. Luckily for us, sugar has been around for 150 years, so that issue is already off the table.

The second part is the community benefit. At the moment, we just pump out electricity into the grid—around 350 megawatts worth—using the current market regulations. There is a better way to do that. How do we share that benefit with growers and local communities through local virtual microgrids, not necessarily physical microgrids? How do we reduce those energy costs locally, noting the local benefits?

The other point as well is that we do not actually get the benefits of our baseload nature. We are not a scheduled generator, despite the fact that you can almost set your watch to our energy production, and nor do we want to be a scheduled regulator because our No. 1 priority is making sugar, not electricity. However, we create huge benefits for the electricity grid, and that does not get recognised or monetised, which makes us less competitive than something like a renewable backed up by battery because they get another subsidy through the Capacity Investment Scheme.

There is a lot of local benefit that we could capture that we are not capturing currently. We do not have the same social licence issues. Finally, we do not get the market revenues that we should get, and we can expand to around 800 megawatts, which is about half a million homes' worth of electricity.

Mr MARTIN: I have a question about cane rail infrastructure. Your submission highlights the fact that the existing cane rail infrastructure faces significant replacement costs and currently does not have any government investment. What measures do you say the Queensland government should take to ensure the integrity and capacity of that network, especially if it will be relied on in the future for emerging bioenergy markets?

Mr Salardini: Do not quote me on this—I think I am in the wrong place to say that—but I think it is actually the second largest network if not the third largest network in Australia and it is completely privately funded. That is not because it is a huge asset we are making money off; it is because no-one else would run it. We have 4,000 kilometres worth of it and the replacement value of it is getting close to $3 billion. The last time we did an analysis it was $2.5 billion, and that was in 2020 and costs have gone up significantly since then. The issue for sugar production is that if we lose that network it is not great for the sugar industry or those local and regional roads and communities because you are going to have huge congestion and the freight task is going to move onto roads that cannot handle it from a maintenance perspective.

The other one is from the biofuels perspective. As I said, we have nine million tonnes of bagasse that we can convert to biofuels and bioenergy. There are nine million tonnes of tops and trash sitting out on the farms of canegrowers. If we can take forestry residue, there are 20 to 30 million tonnes more combined of bagasse and tops and trash. That is a lot of things that we need to move, and we need to move it somehow if you want to make the biofuels and bioenergy industry stand up and be scalable. We have a ready-made solution in that network, but again it has a replacement value of $3 billion and we are not an industry that can afford to continually maintain this.

There are some easy supports we can look at. One issue is around building back better and disaster recovery. Currently we do not qualify for disaster recovery payments. One area where we could see potential benefit is when there is disaster recovery, a fifty-fifty approach with government to build back better so that, for example, when level crossings or signals are washed out, we build them on platforms so they become disaster-proof and disaster resilient. That is one element. I think we have costed that. It would be around $10 million every four-year period for those measures. The other one is around co-investment in maintenance and expansion, particularly bridges, because each bridge is $20 to $30 million. We have more than 100 bridges across the network and a lot of them are coming to the end of their useful life. Again, it is about the strategic approach, where we actually have the most throughput, where we have the most potential, and to maintain as much as of that network as possible. Disaster recovery funding is probably primary and then co-investment in maintenance and expansion as well.

CHAIR: In terms of the pelletisation issue, can you help me with the viability and feasibility of that and, more importantly, the process. We saw it a lot in our inquiries and it has been spoken about. I still have not got my head around what you have been advocating for.

Mr Salardini: There is another opportunity, which is probably the no-regrets opportunity. You can put bagasse, tops and trash and other biomass under pressure and create very dense, carbon-rich pellets. A pellet made from bagasse has 50 to 60 per cent carbon whereas a lump of coal has about 70 to 80 per cent. Recently one of my members went overseas and did some trials. They have made a more granular pellet, it is more like a powder, and that has 70 per cent carbon content, so it is almost a like-for-like replacement for coal. You can use it in coal-fired plants, in furnaces and in smelting. You can even use it in electricity production at a coal-fired power plant. That pelletisation process makes the peat itself denser so it is easier to transport and water resistant. It is a huge opportunity because they can feed into a multiple set of existing infrastructure and technologies, whether it is for biofuels, electricity or manufacturing, so that is the opportunity.

In terms of the technology, it is really about improving that technology and rightsizing it for the industry. For example, on those trials where one of our members went to America, just through some tweaks on how they were using it in America we have managed to get an extra 10 per cent carbon content in that pellet, so there are huge opportunities. But again there are risks. The costs of this technology are high. There are issues with scaling and improving it at an industry level, and that is where the support is required. It has a lot of legs, because essentially it is a no-regret solution. Let's say, for example, this biofuels future is a nonsense, well you can use pellets in electricity. If we solve the electricity problem so then we do not need electricity from sugar, well we can feed into a biofuels process. If you say both of them are nonsense, we can feed it into green steel production and smelting. It is almost a no-regret solution. The cost needs to come down over time though.

CHAIR: Does that allow our mills to have a longer life over the 365 days of the year than the crush?

Mr Salardini: I do not necessarily think it is going to create a difference in the length of the crush. Obviously, you would be utilising your assets for a longer period of time, particularly if you used tops and trash from growers, because then you can use your rail infrastructure to bring the tops and trash in and then it will be a process during the off-season with things like forestry, tops and trash and other agricultural residue. So you would be using your assets throughout the year and actually creating revenue streams for others as well?

Mr SMITH: When we went on the committee tour, millers noted that they had not been engaged with any Energy Roadmap strategy. I am just wondering if ASM or any of the mills you represent have been contacted in terms of putting forward roundtable discussions into the Sovereign Industry Development Fund or the greater Energy Roadmap at all?

Mr Salardini: With respect to the road map we have not been engaging, but from an energy perspective we have been engaged with department of state development for biofuels and bioenergy and also with the sovereign capability fund as well through the department of state development. So no to the first part of the question; yes and yes to the second and third parts of the question.

Mr SMITH: What confidence is there that the Energy Roadmap complements a prosperous future around biofuels into the future?

Mr Salardini: I guess the proof is in the pudding, but we have heard from government that biofuels and bioenergy are part of the government's priorities. The sovereign capability fund, for example, highlights it as one of three key opportunities, but I think we need to engage with the government on the road map part of the equation.

Mr G KELLY: The Queensland Energy Roadmap has been pretty focused on the coal that is here. We need a base load; it will be around for decades to come. Moving forward, with power stations coal is king. When it comes to what we are looking at here with biofuels and cogeneration to produce energy, to me water is king. When it comes to this we are going to need to grow more crops somewhere, and that could possibly mean looking at growing on more marginal land. Has anybody looked into more dams? I know we have an abundance of water in the north, but there is not so much further down the coast. Is there a plan in place, do you think, where we could look at dams to utilise what we can do with this cogeneration moving forward?

Mr Salardini: That is a great question. One of the great successes is the water infrastructure that created the Burdekin. As an example, the sugar industry is half the industry now. With the right investment in water infrastructure, you can create a massive uptick in supply. You are exactly right. Just five years ago we used to crush 35 million tonnes of cane; now we do 30 million tonnes. Technically, we should be able to get up to 40 million tonnes with R and D and available water. You are exactly right: in the far north usually water is not the issue. Sometimes you have an excess of water, but the further south you go a more consistent water supply is a big issue. If there was a strategy around that, I cannot see why this industry could not do 40 million tonnes of cane quite easily. There is a huge opportunity from an R and D perspective to make sure we use that water efficiently so we grow the tallest cane with the highest carbon content and the highest sugar content as well. There is an agenda there that we could try to leverage to really grow this industry. That is an ambitious agenda that you have put forward.

Mr MARTIN: One of the things the committee has looked at—I think ASM mentioned it as well—are microgrids. We are aware there are some trials around Queensland in relation to microgrids. Has the ASM or the millers been involved in those trials? What has the experience been? Have there been any trials specifically between the millers and then back to the grower?

Mr Salardini: Trying to actually physically create a microgrid may not necessarily be the best strategy. When people say microgrid, they are noting that the mill makes all this excess energy and growers use a lot of energy for irrigation, so how do we combine those two things from a supply and demand perspective. You can do that virtually. There are things called virtual power plants and virtual agreements. I think that is what we are suggesting that we do, that somehow we create a contractual obligation where the benefits of renewable base load power that the mills provide is recognised and monetised, and in doing so it results in a cheaper tariff for that region, noting that you are going to use less infrastructure and you are going to have less need to stabilise the grid because you are using base load power. That is probably the mechanism: a virtual power plant for the region where you recognise the benefits of that local power production and the fact that you are using a lot less infrastructure to get that power to where it is used.

Mr MARTIN: My understanding is that there have not been any trials in the sugar industry for microgrids.

Mr Salardini: No, there have not been any trials for sugar in microgrids because we have already got the infrastructure there. A microgrid is great, particularly when the infrastructure is not there or reliable, but one of the things I would suggest is that most of the cane you see around a mill comes from about 50 to 60 kilometres away and they have good access to electricity. Microgrids are usually when you are further out on a spur line or you do not have electricity or the reliability of that electricity is not good. A physical microgrid essentially would be taking growers off the main grid, which probably reduces their reliance on the NEM. Virtually doing that is one thing, physically doing it is another.

Mr MARTIN: It is not an infrastructure thing. It is an energy regulation—

Mr Salardini: Exactly. A contractual thing and a regulatory thing, yes.

CHAIR: A number of times you raised the co-investment needed for the defence industry and biofuels supply chain. Are you able to give the committee a further update or any other conversations that may be happening in that space?

Mr Salardini: Yes, that is a great question. It is a really good way to try and promote this market. Government procurement can help establish this market. In Queensland there are a lot of defence assets. Around Townsville, Brisbane and Cairns we have naval and Air Force assets, and they use a lot of maritime diesel and they use a lot of aviation fuel. One of the benefits we have is that we are almost like-for-like collocated up and down the coast with the defence industry. From Cairns all the way to the north of Brisbane—even south of Brisbane—the sugar industry is already there. That means there is a secure supply chain and it is a short supply chain.

If you have a chance to get to Cairns, go to the sugar terminal in Cairns. It looks like the defence industry is trying to do a pincer movement on the sugar industry and invade it, because all of the assets and land around it have been bought by the Navy. In fact, during the off-season they use our landside assets as well. That is a very secure supply chain. It is a supply chain that already exists, so making biofuels and feeding into those maritime assets would not be a tall order. Similarly, around Townsville you have a lot of Air Force assets and again Burdekin is just around the corner from there. It is a very short supply chain, and then it will create that demand to get people to invest on the supply side as well. There is a huge opportunity. The Defence Force has put out consultation around the opportunities in defence and in the next couple of months that consultation will close, so clearly it is on their radar. It is about all stakeholders working together—local, state and federal government—to make it happen, because there is a national fuel security imperative behind that as well.

CHAIR: Our time has come to a close. Thank you again for all your work in this space. We look to it continuing as we come to our final drafting. I am sure it will not be the end of our discussions, so thank you once again.

HAMPSON, Mr Mark, Chief Executive Officer, Managing Director, Queensland Sugar Ltd

CHAIR: We invite to you make an opening statement after which the committee will have questions for you.

Mr Hampson: Thank you for the opportunity to address the committee and this inquiry. I am speaking today on behalf of Queensland Sugar Ltd, a not-for-profit, industry-owned organisation that provides raw sugar marketing and logistic services to the Queensland sugar industry. Originally established as the Sugar Board in 1923, we have served the Queensland industry for more than a century and today we are responsible for the operations of the bulk sugar terminals at port on a cost pass-through basis and are responsible for marketing more cane, more growers' sugar than any other marketer. We return all net value generated to the members. Despite the challenges in a volatile market, raw sugar production offers Queensland producers a valuable proposition beyond just price that to this point it is difficult for other sugarcane products to surpass.

These advantages include independent price discovery through the ICE 11 futures contract, the ability to lock in prices for three years forward, legislated access to marketing choice providing competitive marketing services, and innovative payment and pricing products. These factors have all contributed to sugar's enduring role as the state's biggest agricultural crop, with the relative strong returns offered by sugar over time largely making bioenergy products uncompetitive as a first-generation product. That is not to say there is not an opportunity and that we do not support an opportunity; it is just a statement of fact as we look at history.

Second-generation biofuel products which can be created by sugar industry by-products would provide and should provide welcome additional revenue streams to supplement sugar returns and support producers' long-term viability. It is important to note that under the existing cane price formula, which underwrites cane supply agreements, the growers only receive payments for raw sugar crystal generated from their cane. The payment for other products is not universal with many growers currently receiving little to no additional revenue from non-sugar products derived from their cane, including ethanol and cogeneration. To this end, QSL believes it appropriate that growers be fairly compensated for bioenergy and other products which may be derived from their cane outside of the cane price formula. Failure to do so could not only act as a barrier for grower support, but could incentivise millers to prioritise non-sugar products and associated revenues at the expense of sugar revenues and grower returns.

Mr MARTIN: Thank you for being here today. In your submission I notice you stated that the sugar industry was making strong returns. Could you expand on that? We heard from a witness that they were making returns of three or four per cent.

Mr Hampson: I think if you look at it in a price context we have had record prices over the last three years. I think the highest price achieved by Queensland growers was $980 per tonne of sugar. To highlight the volatility of sugar pricing, today's price is below $500 a tonne of sugar and that has happened probably in 12 or 18 months. That is below cost of production. The unique nature of sugar and this market transparency means growers can go into the market and access price hedging three and four years forward so they can protect margins, protect their asset, protect their business across a longer dated curve and we have seen much of that with the advent of marketing choice. While sugar prices are volatile and below cost of production today, there are many growers and millers out there who have benefited from the higher price environment that we have been through. As you know with commodity cycles, there is a bit of a high and a low and that cycle generally runs for five to seven years. We are in the low ebb of the cycle at the moment.

Mr MARTIN: If the Queensland government were to invest in feasibility studies and also make investment that increased the returns for bioenergy for millers, and for growers potentially, you are essentially suggesting that could be a risk to the sugar industry?

Mr Hampson: I see it as an opportunity more than a risk. I think where we would want to focus our attention particularly is making sure that the payment of revenue distribution mechanisms that are in place ensure that the value is distributed along the supply chain and it is not a mechanism to essentially redistribute revenues away from cane producers and into millers or manufacturers. I think it is more around the way the marketplace is constructed and the mechanisms for payment within that rather than a risk.

Mr MARTIN: Just to be specific, if the miller is buying the cane, is it not up to them to decide if they want to make sugar or generate energy? Isn't that their decision?

Mr Hampson: Ultimately the growers are exposed to the sugar price so if the miller is making something other than sugar we would need to ensure there are protections in place to ensure that the growers are no worse off than the revenues they would have derived from sugar. There is no nonsensical approach. If making another product results in a lower payment for cane to the grower than that of sugar, ultimately the growers are going to—

Mr MARTIN: If the settings are wrong potentially you could have a lower payment to the grower and a higher return to the miller?

Mr Hampson: Correct.

CHAIR: I guess future marketing of sugar is a complex issue. This House has been through that many times. Maybe when we hear from Dan Galligan in a future hearing he can explain that complex nightmare of sugar marketing.

Mr DALTON: Given your role in bulk sugar terminals and logistics—like the one in Mackay—what are the additional logistical and infrastructure burdens you foresee if sugarcane feedstocks shift towards bioenergy, and how should government and industry plan to fund these changes?

Mr Hampson: We are already experiencing that with the decline in sugar production. Over the last four or five years I think we have seen a decrease in both cane and sugar and as a result the returns that are being paid against those port assets continue to escalate and if they continue to escalate it does place us at an uncompetitive disadvantage to those of our competitors in Brazil and Thailand. Given the sheer lack of raw sugar throughput at those terminals, if something is not done around the returns and profits that are being generated by those assets then, yes, there is going to be a cost impost to industry.

Mr SMITH: I am trying to get my head around some of the figures here. We crush 30 million tonne of cane in Australia, which mainly is Queensland based. That produces four to five million tonne of actual raw sugar. Then we are hearing that we need about nine million tonne of raw sugar to create sustainable aviation fuel. Then we talk to the mills and they are more just focused on cogen and bagasse and so forth. In terms of your experience working with millers, what is the actual want to go away from producing raw sugar for human consumption and to go into creating sustainable aviation fuel? Is it more financially beneficial to the millers to abandon a long practice that has built the back of Queensland?

Mr Hampson: I think it is probably a question best directed to millers, but in our view there are advantages to producing other products when it comes to operating those assets, for sure. There is no doubt strong demand potential for sustainable aviation fuel and the cane industry should be open to exploring those opportunities. I guess our view would be that it needs to respect the longstanding foundation that the cane price formula is derived from raw sugar and if that is not protected in some way your cane could be worth less, albeit you may see additional growth—greenfield or brownfield—growth in production, but I think from our perspective as long as the growers are comfortable with the returns and those returns are transparent then it should be explored. From a milling perspective I think it is largely for them to describe the benefits.

Mr G KELLY: How would you bring in the canegrowers to be active participants in bioenergy or how would you ensure it from a government perspective? What are your strengths to make sure that it is going to be a comfortable journey?

Mr Hampson: In recent years the Queensland government got behind some legislative changes that gave growers both transparency and access to a marketplace that gave them the comfort and protection that they could effectively access the world sugar price. I think from a cogen perspective or an aviation fuel perspective, as long as the payment and discovery mechanism respects those foundations then the growers will have a look and get a say in whether it is good for them or not.

Mr MARTIN: One of the ways the millers have said that the growers can benefit is from microgrids or virtual microgrids. Does QSL have a position on those? Is that a way that the miller can effectively compensate a grower?

Mr Hampson: We do not have a position and we are certainly not the expert in that area. We are aware that the cost of power is obviously an issue for growers so anything that can be done that is a direct benefit or de-emphasises that rising cost or input cost then I am sure they would be open to it.

CHAIR: Most of us are from sugar seats, but what QSL assets do you manage up and down the cost, just to put into perspective the size of the organisation?

Mr Hampson: QSL is exporting a little over 1.3 million tonnes of this crop. Obviously the crop is small. It is generating in excess of $1.2 billion in revenue. We operate the six bulk sugar terminals, which are the six port assets. We do not own them, we are an investor, but we are the operator. We move some 3½ million tonnes through those six ports per annum and we have been doing that since 1999.

Mr G KELLY: Obviously the key for any business is security of jobs. Going down this path can you see a big future in jobs with how you work?

Mr Hampson: From a very simple point of view if there is more revenue and additional returns in it, particularly for growers, you are going to see investment in expansion and investment in productivity and along with it the creation of jobs, particularly the movement of the biomass through our supply chains. So in short, yes. The more complex answer is it goes to profitability, it goes to returns and it goes to labour availability which is a big issue for the industry at the moment. There are more jobs out there than people available to fill them.

Mr G KELLY: That is correct. Jobs are key.

Mr DALTON: In your submission you highlight the limited number of mills, their locations and transport infrastructure challenges faced by growers. Given the significant cost of building and maintaining a mill, what is QSL's preference for diversification opportunities in light of the current challenges canegrowers face in having their crop processed?

Mr Hampson: I think without the invention or development of new technology that relationship between grower and miller, and that monopoly infrastructure arrangement, will exist well into the future and therefore the creation of a marketplace hangs together on the back of either legislation or contractual transparency rather than the ability for growers to move their product outside of that supply chain at this point.

Mr DALTON: Do you foresee any new technologies to assist with that milling process?

Mr Hampson: Again, we are not milling experts. I think where we have seen some discussion around alternative technologies is more around trash—on-farm by-product: tops, tails, trash, these sorts of things. We are seeing businesses interested in looking at how they can commercialise that, which is a development of new technology, yes.

CHAIR: With the way bulk terminals are set up pretty much to move raw sugar, if and when we do move to a more bioenergy future for the sugar industry do you see any infrastructure burdens or any other investment that QSL may need to help support that process or would you pivot also to the bioenergy market?

Mr Hampson: We are not the owner of those assets and it is probably a question best focused to them as to whether they see opportunities towards developing new storage tanks and the like.

CHAIR: Are they privately owned?

Mr Hampson: They are owned by a company called Sugar Terminals Ltd, which is industry owned. Growers and millers own that. At this stage my understanding is they are not looking at anything related to liquid fuels and obviously there would need to be a discussion had as to whether they are the right organisation to look at that, but certainly from a bulk sugar perspective it does pose some concern to those assets that if we are not moving enough sugar through it they become a bit of a millstone.

CHAIR: On those port sites traditionally there is bulk fuel storage capacity adjacent or already existing in some cases or most cases?

Mr Hampson: Yes. They would be owned by a third party, not necessarily owned by that company, but there is certainly space at port for development if that was of interest.

CHAIR: Thank you very much for your time this morning. It has been very helpful. We appreciate your time.

DOUGLAS, Mr Adam, Industrial Manager, Jet Zero (via videoconference)

MASON, Mr Ed, Chief Executive Officer, Jet Zero (via videoconference)

CHAIR: I invite you to make an opening statement before we start our questions.

Mr Mason: Thank you, Chair and members of the committee, for the opportunity to appear before the inquiry today. Jet Zero is a bioenergy company established in 2021 and focused on the development and production of SAF and renewable diesel from Australian feedstocks for the Australian market, using proven technology pathways. The support we have received from the Queensland government arena has been welcomed but, importantly, most of our investment to date has been sourced from the private sector, including strategic investors Qantas, Airbus and Idemitsu of Japan.

A$75 million has already been committed to Project Ulysses in Townsville, one of the most progressive SAF projects in Australia using the alcohol-to-jet technology pathway to convert domestically produced ethanol into over 100 million litres of SAF and renewable diesel. It is the deployment of this ATJ technology using Australian bioethanol that represents one of the most significant economic and regional development opportunities before this inquiry. It is this industry that can strengthen and grow both food and energy production in the sugar industry, as witnessed in most other sugar markets around the world. Our project is advanced, with front-end engineering and design now underway ahead of a final investment decision next year.

Some submissions have suggested that ATJ technology is not commercially proven. I would respectfully point out to the committee that there are multiple international licences of projects under development using ATJ technology, and our technology partner, LanzaJet, has successfully commenced commercial-scale production of SAF in the US. Furthermore, this industry is already established outside Australia with SAF used in many international airports. In the past two months alone, we have seen South Korea, Hong Kong and Singapore all legislate SAF usage in the next few years.

This represents a here-and-now opportunity for Queensland, a view shared by Jet Zero's industrial manager, Adam Douglas, who joins me here today. Adam has had 32 years in the sugar industry as a grower and manager of the Herbert mills. The industry has also been validated with the support of over $1.4 billion from the Commonwealth government in recent months. In addition to the emissions and job benefits, we will strengthen national fuel security in regions where investment in defence and armed forces is only increasing—places such as Townsville.

It is increasingly a question of when, not if, Queensland leverages this global market shift, driven by international mandates and airline commitments. SAF demand is projected to overtake the value of the global sugar market by 2034. If Queensland does not move decisively, it risks falling behind competing cane-producing regions such as Brazil, Thailand and India and other markets that have already mobilised towards high-value biofuels and are attracting significant private sector capital to invest in SAF supply chains. Queensland leads the nation in biofuel initiatives but unlocking sugar cane through intermediate ethanol production remains a key step to fully realising the industry's economic potential.

CHAIR: Mr Douglas, do you have anything to add or are you happy to go into questions?

Mr Douglas: I am happy to jump straight into questions.

Mr MARTIN: How feasible do you say it is to retrofit Queensland's existing sugar mills for ethanol and SAF production? What is the level of capital support or government investment that would be required to accelerate those conversions?

Mr Mason: I will answer the last part of that question first. We have received some funding support from the Queensland government and the federal government, which has been very welcome. We have raised multiples of that through the private sector with big backers and financial institutions. With regard to fiscal support, I would say it is important. It validates it. The state wants this industry and is standing behind it but, importantly, you can attract a lot more private sector capital, which I think is critical particularly to any biofuel project, to show that there are others that are funding this and that the project can stand on its own two feet.

With respect to the viability of co-located plants, we believe it exists although our project in Townsville is not co-located. It is a standalone SAF facility in the Cleveland Bay industrial precinct. It is being designed to be in construction by 2028.

Mr MARTIN: One of the suggestions from the sugar millers was that the government invest in pre-feasibility and feasibility studies. Would Jet Zero support that? Is that worthwhile government spending?

Mr Mason: Yes, absolutely. We have welcomed and received government spending for feasibility and FEED studies to date. We continue to pursue support through the Commonwealth government as well as the state government, through the development of the project that we are trying to reach financial close on in 2026.

Mr DALTON: The key theme of your submission is that sugar mills should transition to the distilling of cane juice to ethanol. What dialogue have you had with the millers on this transition?

Mr Mason: When we commenced the project back in 2023-24, we were engaged directly with millers. There is commercial-in-confidence around those discussions and I cannot talk in detail specifically about which mills and what discussions took place. They were everything from sourcing ethanol through to partnering, investing and acquiring operations to support the unlocking of ethanol production in the Queensland sugar industry.

Mr SMITH: Mr Mason, as a quick run-through for people, how do we go from cane to sustainable aviation fuel? What components are we using? Are we running it through the mill, collecting the bagasse, dunder and molasses, collecting sugar and then refining it all? What are the steps and the components of the actual cane itself that we are then transitioning into SAF?

Mr Mason: I will defer to Adam Douglas who has run several mills and can answer in detail what you need with respect to that process.

Mr Douglas: The first thing that I want to say is that, for there to be a viable biofuels industry in Australia, the price of the feedstock has to match or better that of sugar, as the two previous people have said and it is certainly true. The process of making ethanol from juice is a well-known process. It is still used as the front end of the sugar factory: the crushing, the millers, the boilers, the clarification stage. We take that juice after clarification and we ferment it to an ethanol. The ethanol goes into the alcohol-to-jet fuel process. It certainly can be done.

We see it as a regional approach. You need the volumes and the scales of economy to build a plant. For example, the plant in Townsville that we are constructing would need 2.3 million tonnes of cane—no sugar, just straight cane to ethanol—to produce enough to feed that facility.

Mr SMITH: In your submission you said that Qantas's 10 per cent SAF target by 2030 would require 15 million tonnes of cane so half of Australia's current crop. That is just for 10 per cent of one airline.

Mr Douglas: That is correct.

Mr SMITH: What is the expectation? Is it sugar cane that is going to be the backbone of SAF production or are we going to need to explore other crops? Ten per cent is half of our raw sugar industry gone.

Mr Douglas: That is right. It physically shows you the size of the SAF market and how much aviation fuel we use. On the physical volumes, 10 per cent of Qantas's self-imposed mandate was 15 million tonnes of sugar cane. That is not making any sugar; that is straight sugar cane to ethanol, ethanol to SAF. The biomass needed to go 100 per cent is exponential.

Mr SMITH: How much feedstock has Jet Zero been able to secure and how much SAF do you believe Jet Zero can supply to Qantas for their 10 per cent target?

Mr Mason: The plant in Townsville produced 100 million litres or one-sixth of what Qantas is seeking to use on its flights by 2030, on a blended basis, so it needs six times the size of Townsville to meet that demand, but there are other projects around the country at various stages of development that could meet that. Specific to the project in Townsville, we need about 200 million litres of ethanol to feed that. That is more than three times the volume of ethanol produced from the Australian sugar industry today, out of Mackay-Sarina. We have sourced 100 per cent of our ethanol through other sources of feedstock to meet that demand in Australia. That has ensured that we get a SAF project built and off the ground so we can catalyse supply of ethanol from the sugar industry in the future as we look to grow that plant and increase its capacity over time.

Mr G KELLY: Ed, your submission mentions that sustainable aviation fuel has the potential to be worth US$134 billion by 2034. What is the current global market as it stands today?

Mr Mason: Today, the size of the market is two billion to three billion litres. If we look at projections on mandates alone—and this is something that I need to underwrite; these are mandated demand drivers, not voluntary—we are looking at that industry to grow to 160 billion litres on IATA

forecasts by 2050. If we look at voluntary targets, which is what Qantas and other airlines have committed to, then we are nearly at 450 billion litres by 2050. If we look at the international pricing of sustainable aviation fuel at around US$3,000 a tonne, you can start to grasp the size of this industry and the pace of acceleration.

As per my opening statement, in the past eight weeks alone we have seen Hong Kong, Singapore and South Korea all legislate SAF blends. Australia is one of the few countries in the OECD and G20 without a SAF mandate. This industry is growing at a huge pace. All flights out of London and all flights out of Europe have SAF blends. The Trump administration is supporting the industry big time in the US through the extension of tax bills and funding for projects. Other big markets in the sugar industry in Brazil and Thailand are all moving ahead with projects.

Mr G KELLY: Ed, at the end of the day, water is going to be key to where we are going with this; is that correct?

Mr Mason: In the production of SAF we actually produce water. We dehydrate the ethanol into ethylene so our water issue is what we do with it. In the overall industry, if we look across the supply chain, we acknowledge certain feedstocks are dependent on water and some regions are more favourable than others. To be clear, we are a SAF developer and operator. We will get involved in the supply chain but we are not farmers and we are not upstream and owning ag assets.

Mr MARTIN: I want to touch on the price per litre of aviation fuel versus SAF. What is the price per litre in Australia that we are capable of producing now and what investment and what scale do we need to bring that price down? Is that something that Jet Zero has looked at?

Mr Mason: Absolutely. As a developer and operator, we are all about getting projects banked and off the ground. Sustainable aviation fuel trades at a multiple of jet fuel. In the international market today out of Singapore it is trading at between US$3,000 and US$3,500 a tonne. That is what we target across all our projects as a range both today and long term for the production of sustainable aviation fuel.

Mr MARTIN: What is the multiple? It is trading at US$3,000 per tonne but what is the multiple for regular aviation fuel?

Mr Mason: Two to three times.

Mr MARTIN: In Australia, can we produce SAF for three times the cost of normal aviation fuel?

Mr Mason: All our products target that. We believe we can.

CHAIR: In your submission, you have talked about the infrastructure of mills, the railway network and all those things. You talked about the mills being better equipped with maintenance and other issues around what it may mean if they did do a transformation to SAF production. Could you talk a bit more about that?

Mr Douglas: I think it is well understood that the Australian sugar industry is at cost of production and the assets are getting old. With the transition to biofuels, it would simplify the process station of the factory. When you look at the evaporators, crystallisation, pan stage, fugals, sugar handling and all of that infrastructure, it makes up a large portion of the plant. With the change to biofuels, we simplify the sugar processing. Obviously we would need to invest significantly in the development of distillation and fermentation equipment. In doing that, we replace the aging assets. The sugar industry have two choices: they can either continue to buy capital equipment that is at end of life or they can invest in a new industry that diversifies their income and gives them more revenue.

Mr SMITH: Can you take me through the supply line again. We have the canegrowers. Then the cane goes to the mill and cane juice is produced. Are you going to purchase the juice off the millers or are you going to go into partnership with the millers?

Mr Mason: No. To be clear: the project in Townsville needs 200 million litres of ethanol, and there is not even a third of that production in total coming out of the sugar industry in Queensland to supply that. We are sourcing Australian ethanol that is bankable today to get that project off the ground and developed in 2026 so that we can source for the volumes we need. Any additional supply of ethanol that comes from the sugar industry in the future or anything we can unlock through investment and partnerships we are very keen to do to grow the capacity of the plant and unlock this industry for the sugar industry.

Mr SMITH: When the cane goes to the mill and cane juice is produced, who is then doing the conversion from cane juice to ethanol?

Mr Mason: Adam, do you want to talk theoretically about that?

Mr Douglas: There are a lot of different permutations to this. In principle, what we would support is that all members of the value chain would need to benefit from the additional revenue. What we would like to do is grow the size of the pie. I am sure that the sugar industry will argue who gets what slice of the pie until the cows come home. I think the message needs to be that we need to diversify the industry, have this additional revenue stream and grow the viability of the Australian sugar industry. You cannot have the growers being poor and the millers being rich. At this stage we have nothing to do with the Australian sugar industry. What we are trying to do with the project in Townsville will be a catalyst for the Australian sugar industry to move into ethanol production because there will be a viable alternative to sugar crystal. Unless we build this business in Townsville, the sugar industry will not move. It is an important catalyst. It is my personal driver, as a North Queenslander who has given his life to the sugar industry, for joining Jet Zero. It is about trying to keep this industry alive because none of us want to see the Mossman mill scenario.

Mr SMITH: It would be the millers who would be selling the cane juice on and then the conversion to ethanol would happen through another—

Mr Douglas: We do not have any—

Mr SMITH: No. I am saying theoretically. I understand that you are saying it is not happening now. What I am talking about is if there is a request for mass investment in terms of going into something like that currently it is not adding up in terms of the volume. All I want to know is that the millers will produce the cane juice and then they will then on sell that to someone who will then convert it to ethanol.

Mr Mason: We can invest in the ethanol facility and collect the cane juice or we can buy off the mills undenatured anhydrous ethanol directly as is available in the market in Australia today.

Mr DALTON: I am just trying to get my head around this. You are saying that ethanol production is not anywhere close to the level that you would need. Therefore, you are transporting ethanol from places like Sarina in the Mackay region up to your plant in Townsville; is that right?

Mr Mason: The plant in Townsville is sourcing ethanol on the east coast of Australia for the volumes and the specifications it requires under agreement to get the project banked and to get it built. In the context of sourcing sugarcane ethanol in the future, we can source that from multiple locations. Given we are Townsville based, it is central to the north, the central Burdekin and the south regions. We are able to source from multiple locations. I might add that Townsville offers a lot of other benefits in addition to sugar, being it is a garrison city and we provide fuel security. It is an industrial city with access to a port that is close and to amenable sites. Clearly there is potential to grow through agricultural chains in the future.

Mr DALTON: The transportation of ethanol from south or north would be by road or rail transport?

Mr Mason: No. It would be by ship.

Mr MARTIN: I wanted to ask about other crops. Does Jet Zero have experience with other crops in making SAF? If the government is going to look at investing, are there other crops that are easier?

Mr Mason: We are about doing something as de-risked as we possibly can, acknowledging there is a lot of risk in what we have done to date and we will continue to push ahead. With respect to other crops, we have trials that we have commenced in pongamia, which is feeding a different technology pathway with feedstock. We have supported additional trials in Central Queensland to unlock the potential of that crop. We see huge potential. It is not just us but Rio Tinto. Our investor Idemitsu have similar trials going on in Queensland across the state. We are investing in that. Core to Jet Zero we are really a project developer and operator. While we will invest in trials where we see it makes sense, we are about the project development.

Mr MARTIN: From a Queensland point of view, is there a risk that some other technology with another crop will just be far and away better than ethanol produced by sugar cane?

Mr Mason: First of all, the two pathways that are commercialised today are HEFA and ATJ technology. They have been around for 20 years. The alcohol-to-jet technology, which has only recently been commercialised, has been in development for 15 years. We do not see any viable pathways coming anytime soon that project financiers will support. There are multiple crops that can be used to make ethanol that are used around the world and in Australia. That is a potential for other industries to be involved with, but they are the pathways that we believe are most viable for the foreseeable future.

CHAIR: Mr Mason, you have spoken a lot about mandates that have currently been brought in in Asia. In Queensland we have struggled with the E10 mandates, enforcement and other things. Are you able to talk more about that, and what you would suggest or maybe like to see as a SAF mandate in Queensland or Australia?

Mr Mason: The good news is that the industry—with Bioenergy Australia and across the sector from airports to oil and gas companies—is very aligned on what policy is needed. Relative to other mandates that have been announced in the past, such as E10, I think the benefit of the sustainable aviation fuel industry is that it is much easier to enforce given most of the fuel, particularly when you look at Queensland, goes through about three airports. That is, I think, a key policy benefit with SAF in making sure mandates are adhered to and followed. As an industry, and we are very much aligned with this, we are calling for marginal mandates in line with what we have seen in most G20 OECD countries around the world of a few per cent but in line with projects that can be developed to meet those targets. There are aggressive mandates out there such as Japan and other markets that are targeting 10 per cent. Even Brazil last year announced a fairly aggressive mandate target and are looking to unlock a lot of project development in that country to meet that.

Mr DALTON: Project Ulysses is on your website. Obviously timelines are tricky things. Can you outline why Jet Zero has not reached a final investment decision on Project Ulysses despite its inception in 2021?

Mr Mason: Relative to other SAF projects, we have actually moved very quickly. It is for no other reason than just trying to get through the workload of engineering to complete that and also all the development permits, regulatory approvals, environmental authorities and other key commercial agreements that we have had to negotiate over that period. We completed the feasibility study in 2023-24. We have then gone into pre-FEED. We have then completed value engineering to strip out as many costs as we can for the project. Then we have appointed Technip as our FEED contractor and commenced FEED earlier this year, and we are progressing through that. There is no reason other than just getting through the various stages of engineering and approvals that are preventing us from taking a financial investment decision next year.

Mr DALTON: On your website it says that the end date is likely to be January 2026. Is that still in play?

Mr Mason: I expect some slippage. We are still targeting 2026.

CHAIR: There being no further questions, thank you very much, Mr Douglas and Mr Mason. It is been a pleasure to hear from you. It is very exciting. I wish you all the very best and I am sure we will talk some more. We will now adjourn for a short break.

Proceedings suspended from 10.12 am to 10.30 am.

O'HARA, Professor Ian, Deputy Dean, Faculty of Engineering, Queensland University of Technology

RACKEMANN, Associate Professor Darryn, Research Program Leader, Centre of Agriculture and Bioeconomy, Faculty of Engineering, Queensland University of Technology

CHAIR: Welcome. I invite you to make an opening statement and then the committee will have questions.

Prof. O'Hara: Good morning. My name is Ian O'Hara. I am a professor at QUT specialising in value adding to agriculture, including and especially in the sugar industry. In addition to my role at QUT, I also support the Queensland government's Department of State Development, Infrastructure and Planning as the biofuels industry envoy which includes supporting investment in biofuel projects across Queensland. I am joined today by my colleague Associate Professor Darryn Rackemann, who has worked with QUT and, prior to that, the Sugar Research Institute in Mackay in sugar processing research for over 25 years.

The sugar industry is important to regional Queensland, with many communities reliant on its ongoing success through its contribution to regional incomes, infrastructure and employment. Like many other agriculture and agriprocessing industries, however, it is challenged by rising input costs, impacts from weather, outbreaks of pests and disease and the complexities of supplying a primary product into an uneven global market. However, there are global drivers that are putting Australia's sugar industry in an enviable position for future growth and prosperity. Growing global populations, demand for renewable energy and biofuels and other biomanufacture products are creating growth in the bioeconomy, with the bioeconomy projected to grow rapidly over the next 30 years.

As one example, the production of low-carbon biofuels from sugar cane can make a significant contribution to Australia's aviation fuels and renewable diesel requirements, enhancing sovereign manufacturing, improving energy security and supporting the competitiveness of our expert oriented industries. To better detail this opportunity, my co-authors and I published a QUT report earlier this year called *Growing Australia's bioeconomy*, which we have previously provided to the committee online. I have some copies here if you would like to take copies as well.

The sugar industry is the world's best source of renewable biomass. It is the largest crop by volume grown globally. Australia has a large sugarcane crop, but the crop remains economically underutilised. Australia has the ability to put this resource to better use, diversifying revenue and driving whole-of-industry productivity and profitability. However, unlocking these new revenue opportunities is not easy and I would like to briefly highlight two critical aspects.

Firstly, I would like to recognise the importance of R and D in supporting the transition to a diversified future. Investments in new technologies and processes are complex and expensive, and we need to de-risk the deployment of these technologies. For over 15 years, QUT has operated a pilot research facility in Mackay where we have been demonstrating a wide range of new biofuel and bioproduct technologies with industry partners. This facility has recently undergone a major expansion and has recently been relaunched as Pioneer BioPilot to serve the needs of the industry and the community for the next decade and beyond. However, coordinated and focused research investment in sugar industry diversification, beyond business as usual, is required to accelerate and capture the bioenergy opportunity.

Secondly, there is a need for a supported policy environment into which bioenergy and biofuel industries can grow. Other countries have developed or are developing policies, both demand and supply side, to increase their attractiveness for investment. We need to make sure that a supportive environment also exists in Queensland so that our growers and millers have the same chance to benefit from the growth in the global bioeconomy.

Mr MARTIN: You touched on R and D. We have been hearing a lot from millers and growers about investing in bioenergy, but what do you see is probably the most important area for research and development that this committee could recommend to the government that we need to put more investment into? Is there some low-hanging fruit or is there a particular area we should focus on?

Prof. O'Hara: I think our research ecosystem is really well geared to current crop and to current processing methods. There are groups like Sugar Research Australia and other Australian and Queensland government schemes that really support that business-as-usual research, whether it be around plant breeding or around pest and disease or biosecurity. The challenge with research into diversification into bioenergy and other biomanufacturing is that it is a bit outside of business as usual,

so I think there is an opportunity for Queensland to really focus some additional new research investment to support all of these complex challenges. There are supply chain challenges. If we are doing things differently to before, how do we change the system so that the system is better geared towards biofuels? If we are targeting manufacturing capability, how do we change or how do we reconfigure the mills to make them more energy efficient or to reconfigure the processing infrastructure so that it is better aligned to biofuel production or other biomanufactured products? Then there is research around market development. No-one is going to go into different sectors unless there is a clear path to market. I think there is research right across that supply chain that is different to what the traditional research in the industry has been.

Mr MARTIN: Are there other countries we can look at that are doing it really well?

Prof. O'Hara: I think every country, particularly countries with a large sugar industry, are quite heavily invested into research. Research is not the only thing the industry needs. Obviously, we have proponents who are directly investing already and research is happening around the world. I think one of the opportunities for us is to actually connect with what is happening around the world and to make sure that technology is being brought onshore into Australia, so technology scanning and connecting with what is happening to ensure Australian companies are best informed about what is going on.

Mr MARTIN: You would be the people to ask: what information do you have for the committee on technology scanning? Is there something happening in Brazil or Indonesia or elsewhere around the world that we really need to get onto quickly?

Prof. O'Hara: I think other speakers at this forum today will also say that the technologies that people are now investing in in Australia have all been developed overseas. Whether it be the ethanol-to-jet processes or HEFA processes or others, we really benefit from that huge research investment that has occurred over 20 or 30 years in other countries. We need to connect with that really strongly. Aligned with the research, then, is the training and skill development piece. As we bring the technology, as we connect with those technologies overseas, we need to make sure we are training our people in Australia to be able to operate and implement them.

Mr DALTON: Professor, regarding the Pioneer BioPilot facility at Racecourse Mill just outside Mackay, what has been the key learning so far about the scaling of bioenergy and bioproduct technologies from sugar industry residues, and what remains the biggest technical hurdle?

Prof. O'Hara: To some extent, technology is not the issue in terms of where we need to go next. It really is around how we get the economics right. Research can help to drive improved economics for the project. One of the challenges for trying to get an efficient cost of production for a first-of-kind plant—an ethanol-to-jet plant or any other sort of factory—is that until you have built that plant, and until you have built two or three of them, it is very hard to drive the cost of production down. One of the things research can help with is to support the proponents to get to scale and to support the development of that technology so we can drive the costs down, whether it be capital costs, operational costs or other factors. I think it is really important that we support the proponents, that we support the industry broadly in achieving this technology through research and through skills and training. Darryn, do you have any comments? Feel free to jump in.

Prof. Rackemann: I will also mention—Ian touched on it—that a lot of these technologies are being developed around the world. If we are driving the cost of production down, we can leverage off the learnings they have overseas. Definitely not just going at it alone but being collaborative around the world will be another strong benefit in helping to drive those costs down.

CHAIR: Please pass on our thanks to the staff at Racecourse Mill. They were very helpful and it was very enlightening to visit that facility. If you could pass on our thanks for their hospitality, that would be appreciated.

Mr SMITH: In terms of the research—maybe I will go a bit out of scope—what does the data say about the comparison between ethanol production and price points domestically compared to the price point of just importing ethanol from overseas in terms of whether it is bang for the buck for Qantas to wait for Australian ethanol production to produce enough SAF or it is just easier for them to look to overseas?

Prof. O'Hara: I would probably let others speak to the vagaries of the ethanol market in detail. Ethanol is globally traded, so there are very clear benchmarks for the price of ethanol globally. Clearly, if we can produce it domestically then we can save some costs in terms of supply chain costs. It is cheaper to get local ethanol than to pay for the shipping costs from far away. One of the nice things about having a global market like ethanol is that it is a fungible market. We can produce domestically

if necessary and we can import some ethanol, particularly early on to get projects established, but really I think what we all want to see is that very deep supply chain coming from Australia which is supporting the Australian industry—growers and millers—to benefit. There is a deep fungible market. It can be cheaper to produce domestically because of the transport cost, but it is a complex market.

Mr SMITH: On the research data, is there currently enough cane being produced—I will go Australia-wide, but mainly it is Queensland—to have a sustainable aviation fuel market where you achieve more than just 10 per cent for one airline?

Prof. O'Hara: There is certainly enough cane and there is enough capacity within the industry broadly across all of the different sectors, whether it is SAF produced from the fibre—the bagasse or the trash—or produced from the juice, the ethanol. There is absolutely enough sugar cane currently to get started with a renewable fuel supply chain, but I think then there are opportunities beyond that to continue to grow and that could then enhance the growth of the sugarcane industry itself or actually spill over into other agriculture industries that then also see opportunity to supply into that market.

Mr SMITH: Do you support Jet Zero's number of 15 million tonnes or half of the crop to equal 10 per cent of Qantas's goal by 2030? Those are accurate numbers?

Prof. O'Hara: I did not hear those numbers being presented. I would have to do some calculations to check.

Mr SMITH: Wonderful. Could we place that on notice, perhaps?

CHAIR: Is the professor the right one to be talking about volumetric questions? I thought it was probably seeking an opinion more than—

Mr SMITH: I am not sure whether or not you are able to assess it. What volume of cane needs to be crushed to produce 10 per cent?

Prof. O'Hara: We could take that on notice and provide some response.

Mr SMITH: Thank you.

CHAIR: Noted. Thank you, Professor.

Mr G KELLY: Darryn, you talked about negative prices in the wholesale electricity market during the day when we have rooftop solar in the grid during crushing season being a barrier of entry for cogeneration. Would providing incentives and ways to reduce connection costs to the grid help incentivise cogeneration to help bring that baseload power on to the grid at night-time when it is most needed?

Prof. Rackemann: Yes, definitely. We need some kind of drivers there. We used to have the slightly larger renewable energy certificates which gave the milling companies confidence that if they invested in this new cogeneration potential it would be sustainable. We have seen that slowly reduce, so we have not seen any new investment in cogeneration potential for some time. I think there might be some coming around now, or definitely there are a few feasibility studies looking at that case, but in the back of their minds is that potential competing against that negative electricity price. We have some sugar milling companies that are actively undertaking strategies so they can reduce their export during times and maximise when they have the higher electricity prices, so it is starting to filter into the industry, but definitely the industry as a whole needs to develop those ideas and strategies further to get more benefit.

Mr G KELLY: Everywhere I look now we see the term 'BESS'. Is BESS something that could be looked at as a storage for the likes of sugar mills when it comes to cogeneration, to store that energy and put it back into the grid when prices are at more of a peaking level?

Prof. O'Hara: Yes, that is certainly the intent. That is what you like to see—that is, you store the energy and use it when the prices are at their highest or when the energy is most needed, so I think those are absolutely the sorts of things we should be looking at. There is a limit to how much you can scale up or scale down a sugar factory boiler's capacity, so you cannot completely turn it down. You will maybe still have to export some at not the ideal times, but within the capacity of what you can do those are the strategies the industry is trying to work very hard on.

Mr MARTIN: I have a question about the CRC research centre. We have heard that the industry is fragmented and complex and some of the stakeholders have suggested an umbrella body, and QUT's new CRC research centre potentially could be involved there. I was wondering if you could expand on that and what might be required to support that initiative.

Prof. O'Hara: We are currently proposing a new CRC, so this is not something that exists at the moment. It is a proposal that we are submitting to the Australian government for quite a large project which would be a CRC around adding value to agriculture. As one of the key sectors—we are working cross-sectorally here with quite a number of agricultural industries, of which the sugar industry is one—it goes back to this great opportunity the industry has to participate in the bioeconomy in biofuels or other bio-based products. The CRC will advance technology and it will advance technology scanning. It will try to capture that 'not business as usual' research opportunity. As I said, it is very difficult for existing research structures within the industry to fund things that are quite different to traditional business, and the CRC provides a model to do that so we are very enthusiastic about it. We would certainly see participants from the industry but also state governments and the federal government would invest into it.

Mr MARTIN: So there has not been any state government investment in that yet?

Prof. O'Hara: At this stage it is a proposal and we are talking with a variety of parties to invest into it.

CHAIR: Professor, you said that you are growing Australia's bioeconomy. I would like to get it on record, please, if you could speak to those key points about what other countries have implemented. I think it would be really helpful for the committee to hear you talk to this so we have it on record.

Prof. O'Hara: Sure. There are a wide variety of programs that are being developed in other countries to allow those industries in those countries to benefit from this advance in the bioeconomy. I should say: it is not just about the advance in the markets; it is also about the advance in technology. We see what is happening with artificial intelligence and machine learning, with digital technologies, with synthetic biology. These are all advancing incredibly rapidly, so it is a combination of market and technology advance that is really driving countries to consider what policy environments are right for them.

We see things in the European Union—it has been mentioned already—like mandates or support mechanisms for feedstock supply. We see in the US there have been very significant investments through grant funding programs into new manufacturing facilities of all scales. We have seen in Brazil the impacts of their various programs, whether it be the Proalcool program, which drove their ethanol production over 40 years. Both Thailand and India are incentivising ethanol production in significant ways. All the countries are looking at their own opportunities and putting policies in place to do so. In Australia we pride ourselves on being quite reticent to bring too much in the way of policy measures that influence the market. I think the challenge for us is that every other country is doing exactly that and we need to find ways to position our industries in the best possible way to also capture the opportunity. It is an international market and capital is looking to go to the best home, so we need to find ways to attract some of that capital and some of that investment here into Australia to ensure our industries get that same opportunity.

Mr SMITH: Gentlemen, the possible biofuels and energy and bioproducts are exciting, but at the end of the day once a canegrower has harvested and taken it to the mill, the mill see the cane as their product and will do with it what they want—they have purchased it, so so be it. Is that the difficulty in that there are so many exciting bells and whistles out there that we can do, but unless it is mandated on particular mills is it too diverse in terms of the volume that different mills are getting through for their crush? If they see sugar is the best price and they are going to continue to do sugar and do a little bit of cogen to balance off their profit, how do you convince mills about all of the exciting bells and whistles when at the end of the day a lot of them are foreign owned and are focused on just turning a profit in the clearest and most direct way?

Prof. O'Hara: My experience of the sugar industry is that it is a very pragmatic industry and if there is a good business opportunity they will do what they need to capture that opportunity. The challenge with any new technology is that at the start the technology is very expensive and so it is very difficult to get a good business case around that technology. It is the same for aviation fuels. We have heard other speakers this morning speak to the multiples of cost currently to invest into that. However, as you develop that technology and as you implement the technology over multiple generations, the cost comes down and it becomes profitable over time. A great example is what has happened with solar panels. In terms of prices at the commencement of the solar panel sector, you would not do it on a business case alone, but over time it has been driven down to now where it is far and away the cheapest form of electricity. I think that is what we need to do with the bioindustries sector as well. We need to create some room for investment that may require some policy support, but then as we invest the prices will come down, the costs will come down, the profitability will improve

and the market will take over naturally by itself and we can wean the policies away. That is the nature of most new technologies. I think the position we are in now is that we need to get those first projects away if we want to see that opportunity really become a strong one for the industry over the next generation.

CHAIR: Thank you very much for coming and presenting to us today. It is great to finally meet you, and keep up the good work. We need you out there in the industry, so thank you very much. We do have that one question on notice, Professor O'Hara. If you could provide that by 5 pm on 26 November, that would be great. Thank you so much.

IRVING, Mr Jarrod, General Manager, Renewable Gas and Fuels, LMS Energy

JONKER, Mr Mark, Chief Strategy Officer, LMS Energy

POLSON, Ms Andrea, General Manager, Licella Holdings Ltd

CHAIR: Welcome. I invite you to make an opening statement. You guys have divided and conquered with the two functions downstairs, so thank you for doing that. I will hand over to you as the panel to make your opening statements. Welcome back, Jarrod and Mark.

Ms Polson: Thank you, Chair and committee members, for the opportunity to speak today. I am the general manager of stakeholder engagement and communications at Licella. Licella is an Australian technology pioneer and also global leader in the field of hydrothermal liquefaction, HTL, which is an innovative process that converts biomass residues using supercritical water and biomass residues like bagasse from sugar cane into low-carbon liquid fuels or biofuels. Our technology is Australian developed and owned and it is deployed at commercial scale. At Licella's Arbios facility, it is converting residues from the forestry industry into renewable bio-oil for biofuels, and that is happening in British Columbia, Canada—a market where there is a low-carbon fuel standard.

Licella is working with the Isis Central Sugar Mill in the Bundaberg region on a proposed regional biorefinery incorporating our Australian Cat-HTR technology. This facility aims to transform underutilised biomass from the region, including from the sugar and forestry industries, into a renewable bio-oil refined to high-value biofuels, including sustainable aviation fuel. Project Swift presents an opportunity for hundreds of new jobs, regional economic development and new value creation for mills and for growers. We believe that Queensland is uniquely positioned to lead the nation in bioenergy innovation and deployment. With abundant feedstocks, including millions of tonnes of agricultural residues, an exciting opportunity exists to not only diversify the sugar industry but also strengthen national fuel security and drive regional development.

To realise this opportunity, we wanted to highlight some points for consideration as key enablers: prioritising co-investment in advanced biofuels as a strategic pathway for industry diversification; supporting the upgrading of cogeneration infrastructure to enable improving efficiency and freeing up feedstocks such as bagasse for biofuel production; supporting the development of a coordinated feedstock strategy that allocates high-value aggregated biomass residues such as bagasse to biofuels and other high-value applications and lower value materials less suitable for biofuel production such as tops and trash to energy generation; recognising the need to invest in R and D to improve the suitability of sugarcane tops and trash as a future feedstock for biofuels; supporting inclusive policy frameworks that recognise all viable production pathways, including HTL, which is a commercially deployed technology, not just HEFA and alcohol to jet; supporting regions for planning for growth, including land rezoning, workforce development and infrastructure upgrades; and reinforcing the critical importance of scaling supporting infrastructure in industries, particularly renewable energy supply, to meet the power demands of electrified mills and advanced biofuel facilities.

We believe that Project Swift could provide a blueprint for how Queensland can lead globally in sustainable fuel production. With the right policy settings and appropriate investment along the value chain, we can unlock a thriving biofuels industry built on second-generation feedstocks that do not compete with food but complement and diversify existing industries, delivering significant benefits for the sugar industry, Queensland more broadly and Australia. Thank you.

CHAIR: Thank you very much. For the record, Project Swift happens to be in the seat of Burnett. Thank you for your comments.

Mr MARTIN: Thanks, Andrea. In your submission you refer to the UK's biomass strategy, which you say provides policy certainty and investment. What can Queensland learn from this? Can you expand on what you were talking about—that is, HEFA, which currently excludes sugarcane feedstocks?

Ms Polson: Yes. The UK have a number of policy levers. One is a SAF mandate. I think as others have explained, those sorts of policy drivers are where we generally see investment into biofuels and biorefineries. I think the majority of investment that has happened into commercial-scale facilities for biofuels happens in markets where there is some form of subsidy or mandate. That was why we were able to build a first facility using our Australian technology. We had to commercialise overseas before coming back to do it in Australia because there is that low-carbon fuel mandate in the market which actually provides the co-investment and the assurance that there is an end market for the products for project developers building these facilities.

Regarding the different production pathways for biofuel, we would advocate for not backing one technology over others. We need a number of different technologies to access different feedstocks. The HEFA pathway is commercially deployed and commercially technically de-risked in that sense; however, it is limited in its ability to access certain feedstock. It converts waste oils and edible oils such as canola and other seed derived oils. It cannot access the biomass residues, which limits its scalability within the market and so it becomes more of a short-term opportunity regarding biofuels. Other pathways such as HTL are able to access the abundant biomass residuals, which offers scalability of feedstock and helps de-risk future investment in technology. We believe that there is a place for a number of pathways and that within the short, middle and long term, different pathways will offer different feedstock opportunities.

CHAIR: I was probably remiss in not offering LMS the opportunity to provide a statement. Do you have something you would like to add to the committee?

Mr Jonker: Thank you, Chair. Our opening statement will complement the statements of Andrea and Licella. My name is Mark Jonker. I am the Chief Strategy Officer for LMS Energy. I am also the co-founder of Helmont Energy, which is a wholly owned subsidiary of LMS. It is a business that is focused on agricultural-based bioenergy. We are here today to share some of the experiences we have had developing agricultural-based bioenergy projects. We are big in bioenergy. Our company has been around for nearly 30 years. We have developed, own and operate 70 bioenergy projects largely in Australia. We have operations in New Zealand and in the US. We have 19 projects in Queensland and we employ approximately 75 people in this state. We are big in carbon abatement. We predominantly take landfill gas and we turn that into electricity and, in some cases, we flare that gas to reduce the emissions. We see enormous potential in using the agricultural feedstocks that are available in Queensland to produce bioenergy and decarbonise hard-to-abate sectors like the natural gas sector, the transport fuel sector and the industrial fuel sector. That is one of the reasons we have invested into Helmont Energy.

We have been working in the sugar-based bioenergy sector for approximately five years. We spent four of those years developing the Mossman bioenergy project. It was a challenging project for us to develop and there are some learnings we can share with the committee around the development of that project. Fortunately, with my colleague Jarrod Irving, we are taking those learnings to the Bundaberg region and we are developing projects with our project partner, Licella. For us, the key lesson we have taken from the development of our Mossman project is that certainty of supply chain is critical to underpin investment. These projects are $100 million to $200 million of investment, and if the sugar industry is in structural decline it is very difficult for us to attract investment to those sorts of projects.

The Mossman project was particularly challenging because it was a mill that was underinvested. It had been the recipient of a grant and had to transform itself in order for us to make our project successful. We relied heavily on the economic viability of that operation. The same thing will be true for any other bioenergy project that relies on the residues of the milling industry, whether that be bagasse, mill mud or tops and trash. The underlying profitability of the sugar industry and the mill is critical to make this sector viable and to attract investment.

There are a lot of investors in this sector, so our projects do not rely so much on capital grants because there are investors willing to invest. We know from our own shareholders that they would be more than willing to put investment into the sugar industry only on the basis that it was viable and could demonstrate a 15-to-20-year return, so that is key. With that said, R and D grant funding is important for new projects that are bringing new technologies to the market. Projects like the Licella technology will require R and D funding to help overcome some of those initial barriers to demonstrate to the market that these technologies are viable. There are, however, proven technologies—like anaerobic digestion, that can produce biogas, clean that biogas up and inject it into the gas system—that are proven all around the world and could be deployed into the sugar industry today. Those are some of the things we have been working on over the last five years.

The ownership of the feedstock is sometimes unclear. When the growers and the mills are separately owned, in our case it has been unclear who owns that feedstock. Generally, the feedstock is collected and processed in the mill. The bagasse is produced and there are waste products like mill mud. It is those waste products that companies like ours need in order to produce commercially viable bioenergy. When there is uncertainty as to who owns the feedstock or who has the rights to the feedstock, it makes investing in these projects challenging.

The last and probably most important thing, which we have heard this morning already, is that there is a need for a market. There is a need for demand for the products that we produce. We cannot produce renewable gas or renewable fuel at the same cost as the fossil derived alternative. It just will

not happen. In order to create demand for the product, there needs to be a price signal that allows investors like ourselves to invest in these sorts of projects. We have been successful as a country in implementing solar and wind through the renewable energy target, which has created a market for a large-scale generation certificates. That market is now ending with the expiry of that scheme in 2030. What that means practically is that cogeneration projects will become more challenging for investors like ourselves to invest in. There is nothing replacing it right now. There is not a mandate for SAF. There is not a mandate for renewable diesel. There is not a mandate for renewable gas. In our view, it is only when those mandates are in place and the price signal is there that the investment will come to support this sector.

CHAIR: Considering the Isis mill project and the biogas that you mentioned in your opening statement, is that leading to emphasising what we need in a regulatory or policy position change to allow that gas to be imported into the existing gas pipeline—the north-south line from Maryborough through to Gladstone?

Mr Jonker: The good news is that what we would refer to as the block and tackling of the carbon reporting methods has been solved. A few years ago, if you were to inject biogas into the gas system you would not be able to account for the emissions benefit of that biogas; it was treated the same way as natural gas. The Commonwealth government have amended the carbon accounting policies such that consumers who now inject gas into the pipe and use that gas can report a carbon reduction from that gas. The standards around injecting the gas have now allowed for biogas to enter the pipe. Unfortunately, there still is not a market-based mechanism for this renewable gas so it would need to be sold to consumers who are willing to pay a premium for the product in order to underpin that investment.

Mr SMITH: It is wonderful to see innovation in the Bundaberg region. Going to Project Swift, your website says—

> Once complete, the proposed biorefinery could produce ~40 million litres of SAF each year, ~7% of the domestic airline industry's 2030 SAF target.

When you say 'domestic airline industry', is that just referring to the one with the little kangaroo on the end of the tail?

Ms Polson: Correct, yes. They are the only domestic airline that has made a commitment to use SAF. In terms of the output from Project Swift, it is initially targeting processing 150,000 tonnes of bagasse or biomass residues in total. That creates around 56,000 tonnes of bio-oil and that bio-oil is then upgraded into fuel—around 60 million litres of low-carbon fuels of which about 40 million litres could be SAF. That is when the seven per cent comes in. That is seven per cent of Qantas's 2030 target.

Mr SMITH: Are you aware of which organisations across Australia have a current contract with Qantas to supply them with sustainable aviation fuel?

Ms Polson: I probably cannot speak for who is contracted with various airlines, but one of the major SAF projects has already spoken this morning. The challenge for any low-carbon fuel project—whether it is focused on SAF or other low-carbon fuels—is the assurance around the market and the willingness of airlines or other users to pay that price premium in the absence of a mandate. The benefit of sectors such as aviation and shipping is that they are global sectors and they will be beholden to global mandates—operating in and out of places like the UK, Europe and different Asian ports and airports—but the absence of a local mandate does make offtake agreements more challenging with end users.

Mr G KELLY: Andrea, you talk about bioenergy and biofuels competing for bagasse for production potential. Why is bagasse preferred over molasses for biofuel production?

Ms Polson: For our pathway we utilise lignocellulosics—plant-based material made up of lignin, cellulose and hemicellulose. Molasses is not a feedstock that we target for the production of low-carbon fuels via our technology. The reason that bagasse is an attractive feedstock for our process is that it is aggregated and pre-processed at the mill, so it provides a consistent supply and an aggregated supply. There is both a carbon intensity benefit and a cost benefit to moving feedstock around less. Life cycle carbon will usually run from point of origin of the feedstock to point of use of the fuel. In terms of our technology platform, bagasse is something we have experience in and that is why we are targeting it in the feasibility study for Project Swift.

Similar to LMS, we have been on the journey looking at the opportunities for biofuels from the sugar industry more broadly, not just from bagasse. We did a prefeasibility study in the Burdekin region which was supported by the Queensland government and Defence, looking at the viability of

utilising tops and trash. Ultimately, there are both technical and logistical challenges with collection, aggregation and processing. Tops and trash do have a higher chlorine content and a higher ash content which can have an impact on downstream equipment and increase capex. There is still a good opportunity to utilise tops and trash. There is just an investment in R and D that needs to happen to unlock it.

CHAIR: Thank you very much. Thanks for coming along this morning. It is great to see you all again. Thank you for your confidence in the regions. We look forward to talking to you some more about the success of these projects.

JEFFREYS, Dr Ian, Principal Economic and Affordability Specialist, RACQ

KIRK, Mr Andrew, Principal Technical Researcher, RACQ

CHAIR: Welcome. I invite you to make an opening statement.

Dr Jeffreys: Good morning, Chair and committee members. Thank you for the opportunity to speak here today on behalf of RACQ. RACQ is one of Queensland's largest member owned mutuals. We represent over 1.7 million members across the state, including many in regional and remote Queensland. Our focus is on transport affordability, fuel security, decarbonisation and disaster resilience as key issues throughout Queensland.

Many of our members and people across regional and remote communities face long distances. When we look at electrification, limited charging infrastructure and exposure to extreme weather, that is where RACQ sees ethanol, and in particular high-volume ethanol blends like E85, deployed in combination with electric drive trains, as a key strategic opportunity not just for decarbonising our transport network but also for strengthening regional resilience and regional economies.

We will focus on light vehicles. In this space we think extended range electric vehicles, EREVs, are practical solutions. These vehicles operate primarily on electricity but, additionally, they will have an ethanol powered range extender—essentially, a small generator that provides backup power for additional range. This system effectively doubles the range of a similarly designed battery electric vehicle. EREVs are ideal for regional fleets, freight tasks and emergency services, especially when charging infrastructure is unlikely to be feasible or cost-effective. Critically, these offer a pathway to decarbonise the dual cab ute, which really is the workhorse of regional Queensland and the workhorse of a large proportion of our fleet.

We would urge the committee to support expanding ethanol retail and wholesale infrastructure along key highway corridors, potentially strengthening the biofuels mandate and streamlining approvals for bioenergy precincts. We believe these steps will unlock investment, create jobs and ensure Queensland's sugarcane regions are central to our energy future. RACQ is committed to practical, affordable and inclusive solutions, and we believe that an E85 powered ethanol range extender vehicle is part of that mix.

We thank the committee for the opportunity to appear before you today and look forward to more liquid fuels and seeing the sugar industry powering a cleaner, more resilient future.

CHAIR: Currently the mandate is less than two per cent. There is a mandate in Queensland, the E10, but is it not enforced or not as rigorous as it could be?

Dr Jeffreys: The mandate is currently sitting at four per cent of the regular ethanol blend. I believe it achieves around 2.8 per cent of the total regular sales sold in Queensland. Our focus here is more on the higher blends, especially E85. We have E85 in the retail network in Queensland at the moment. About 50 out of our 1,500 retail sites sell E85. We think these higher blends offer better outcomes as a renewable fuel, a low-carbon liquid fuel, as well as in terms of carbon reduction. E10 is not going to have the same impact as shifting to an 85 per cent ethanol blend.

Mr MARTIN: Following on from what you were saying in relation to E85 and petrol stations, you mentioned there are 50 out of 1,500?

Dr Jeffreys: Thereabouts.

Mr MARTIN: There are still quite a few to go. Can you advise the committee what it costs for a petrol station to convert so it can provide E85?

Dr Jeffreys: A lot of work has already been put in and the Queensland government in the past has provided grants to upgrade retail facilities for the use of E10. Our understanding is if a site can run E10 it already has tanks that are ethanol compliant and they have moisture management systems. If you get water in an ethanol tank it will dissolve into the fuel, whereas in a regular petrol tank it will just sink to the bottom, so you need better moisture management systems to run E10. The same systems would be required to run E85. Our research suggests that with minimal changes a site that is currently selling E10 could in future sell E85.

Mr MARTIN: I assume that would require two tanks at least, then. Otherwise, you would switch from E10 to E85?

Dr Jeffreys: A retailer would need to make that decision. Most of our retail sites run on a four-tank system. It is going to vary from site to site, but typically one is a diesel tank and they will offer a premium blend, a regular unleaded blend and often an E10 blend. The capacity is there. As many of the speakers have said, we need the economics to stack up. We need the demand for that fuel for those retailers to switch one of the three petrol tanks to an E85 blend.

Mr DALTON: What is the current status of vehicle compatibility in Queensland for high-ethanol blends E85? What proportion of the fleet is capable and what would it cost to convert or supply more vehicles?

Dr Jeffreys: There are a few legacy vehicles left in the market, but we are not seeing new vehicles coming into the market that are E85 compatible.

Mr DALTON: You are or you are not, sorry?

Dr Jeffreys: We are not. It is a relatively simple task to retool an engine to E85, and my colleague Andrew would be able to talk about the mechanics of that. Most petrol vehicles at the moment could be remanufactured or retooled to run off E85. We are looking for these vehicles for our road patrol vehicle fleets. There are a number of operational requirements. It is difficult to transition to a straight electric vehicle, so we are looking to retool an existing vehicle to run off E85 to trial within our road patrol fleets.

Mr DALTON: Could you talk us through how that conversion occurs and what sort of cost there would be to an individual, just in simple terms?

Mr Kirk: I guess what we are trying to say is that fleets have to transition over to electric. For some vehicles around town that is highly possible and easy to do. We have two parts to the RACQ fleet: our white fleet, which is in-house executive, pool cars and mobile bank lenders; and our yellow fleet, which is our patrol fleet, tow trucks right through to motorhomes and semitrailers. Those areas of the business are very hard to convert to electric. There was only one electric ute on the market previously which had a very low range. It was the LDV eT60, and it was a ridiculous price at over $90,000. KMG SsangYong just introduced a new ute this week. They have announced it. It is a four-wheel drive, dual cab ute that only has about a 390-kilometre range on the WLTP test cycle, so when you put that out in the real world we are probably talking about a range of 300 kilometres. When you then load it up with all of your patrol tools, batteries, jacks and what have you, we are down to about a 250-kilometre range. While that range might be good in and around Brisbane and the Gold Coast area for a day's shift and then recharge at the end of the day, once you start getting out into the regions that is not feasible because you might get a breakdown call that is 150 kilometres away. You can get to the breakdown, but then you are not getting home. That can lead to all sorts of embarrassing moments for the RACQ.

An ethanol range extender would be a purpose-built small generator—we are talking probably up to about a litre engine capacity—which is designed and built to run on ethanol. It runs at a set rev range, so it does not have to power up and down through the rev range because it is just running a generator. It is optimised to run that generator to recharge the battery, which then repowers the vehicle. It is a lot more efficient than an internal combustion engine running on ethanol driving the wheels. Our aim is to do that rather than convert members' vehicles to run a combustion engine on ethanol, which is very inefficient because the engine is not designed to run on ethanol. An ethanol engine will normally have a lot higher compression ratio. It needs a different fuel system, different fuel pump and different fuel injectors because of the corrosive nature of ethanol.

Mr SMITH: I want to make a clarifying point before the question, because I think the clarifying point is important. The mandate on retailers is four per cent. Current achievement is 2.8 per cent. It is not that it is not regulated; it is that there is a provision in the act that says if the retailer can show they have attempted to convince buyers to get to that four per cent then they are not in breach. With that, what sort of advertising campaign and education campaign would you then need to run for the general public to go, 'I didn't really like E10. Now I'm going to go into E85'? That is the biggest thing retailers will tell you. They put up all the advertising that E10 is in there. It is same as why in the suburbs and so forth they do not want to put e-vehicle chargers in there. They will do it on highways, but in suburbia they want you in and out so they can continue their profit. What sort of work would RACQ do in terms of promoting the value of E85 and getting people to buy it and people to produce it?

Dr Jeffreys: We have been supportive of the education campaigns that have been run around E10 in the past. I think we did see an uptake in the consumption of E10 as a result of the E10 OK and similar campaigns in the past. I think a similar campaign shifting vehicles to E85 would be reasonable, and it is something that we would be very happy to engage in and happy to support. I think the biggest

piece of work we can do is use it in our own vehicles and have E85-run road patrol vehicles. That shows our commitment to the product. I think that will speak to our members more than a potential education campaign.

Mr SMITH: Whenever I have to refill a hire car I use E10.

CHAIR: You are doing your bit. Well done.

Mr G KELLY: I think Andrew might have answered the question before. Regional Queensland is a big place and it is where you live in it. Where I live is 4½ hours from my office in Mirani. When it comes to EVs and when it comes to E85, something I have always worried about is disasters. If we are in a disaster, what do we do about charging vehicles? What could the state government do to get this and help you fellows with E85 when it comes to the expansion of what you want to do with it?

Dr Jeffreys: I think it goes back to supporting research and development and supporting the expanded supply chain for retail and wholesale infrastructure. We are looking to put these vehicles into our fleet. There are many similar applications within the Queensland government fleet which this vehicle could be equally useful for and we would be very keen to see those vehicles tried in those applications. We have had discussions with various departments about this. I think it is getting a critical mass of vehicles that will be running off E85 that is one of the major hurdles for widening this project and widening the use of these vehicles—support to get these vehicles into the Queensland government fleet. The RoadTek fleet and the fire and emergency services fleet use a dual-cab ute or a single-cab ute very similar to the vehicles we use in our road patrols. That type of support would be useful.

May I just touch briefly on disaster recovery? One of the benefits of these vehicles is that they can provide power to load. In a disaster situation you could use this vehicle to power small tools at a site when you are responding to particular situations or you could use these vehicles to power an emergency refuge—an emergency shelter. That vehicle-to-load capacity really adds value to these types of vehicles.

Mr G KELLY: They are multipurpose.

Dr Jeffreys: Certainly.

Mr MARTIN: Following on with the dual-cab utes, essentially it is a hybrid but the other way around to what we know. That is what you are talking about. You mentioned before that the engine is always running at the same revs. It is not driving the wheels; it is driving the electric motor.

Dr Jeffreys: The hybrid vehicles that we see out there, starting from the Prius that we have seen on the road for many years now, are parallel hybrid, meaning that both the electric motor and the petrol motor can power the wheels at the same time, so they power in parallel. The system we are looking at is a series hybrid, where the internal combustion engine is not directly connected to the wheels. It purely produces electricity that then charges the battery, and the drive train itself that pushes the vehicle forward is 100 per cent electric. There is no direct link there. Some vehicles are getting close to that. The new BYD Shark, which is proving incredibly popular, kind of does a bit of both. It can run in series, where the engine just runs as a generator, but at times it will also switch to run in parallel. I think that vehicle is close. We would like to see something similar with a larger battery but with a smaller generator.

Mr MARTIN: You are predicting technology, which is difficult. Ten years ago I do not think any of us thought EVs would be where they are now. We see them everywhere and there are cheaper ones than when the new Teslas arrived. Is there not a chance that in the future there will be dual-cab utes that are electric with enough range? Is the RACQ jumping in a bit too early?

Dr Jeffreys: I think it is going to be difficult to see that in regional and remote applications. I think certainly along the coast—100 per cent in the south-east—we are going to see a largely electrified fleet, but I think, and this is where our focus is, when we get into regional and remote locations our electricity network gets very thin and we are not going to see at any point, I do not think, a situation where we could electrify the whole state. We are still going to need a low-carbon liquid fuel solution to be able to continue our economy as it stands. The south-east coastal strip, yes, will probably be electric and as battery technologies improve we will see longer range, but I think we are a long way off being able to continue our regional and remote economy without a low-carbon liquid fuel.

CHAIR: Thank you for presenting here this morning. It was lovely to meet you both. Thank you for your contribution to our inquiry

BLANSHARD, Mr Peter, Chief Executive Officer, Institute of Automotive Mechanical Engineers (via videoconference)

KEENAN, Dr Clive, Managing Director, Wide Bay Pacific (via videoconference)

CHAIR: Welcome. I would like to hand over to you to make an opening statement.

Mr Blanshard: Thank you for the opportunity to appear before the committee. Firstly, globally the use of E10 fuel is accelerating, driven by modern motor vehicle compatibility and also the shift towards lower carbon transport—it is a cleaner way. Almost every imported petrol vehicle entering Australia today is already built and approved to operate on E10 fuels. The international automotive market has moved and the demand for sustainable ethanol blends is rising, not falling—E20, E45 trials in America and E85 in certain states, even E100 in Brazil. Our submission outlines that Queensland is uniquely positioned to lead Australia in the transition.

Sugar cane remains the most efficient feedstock for ethanol production anywhere in the world. With coordinated statewide policy, proper enforcement of existing mandates and a renewed public education, such as the E10 compatibility checker that the IAME helped to deliver and put through Queensland and also New South Wales, ethanol demand is still growing massively. The IAME believes that this would strengthen Queensland's agricultural base, expand regional jobs and reduce—importantly—Australia's reliance on imported fossil fuels.

As you have just heard, range extended EVs, hybrids and the newest global fleets all continue to rely on E10 or greater as a part of the transition to net zero transport. Again, the relevance of ethanol is growing, not diminishing. Queensland has the land, the workforce, the growers and the infrastructure to be a leading primary producer of sustainable ethanol. What we need now is a renewed commitment, strengthening on biofuel policy and consistent enforcement of mandates that already exist. The IAME strongly believes that Queensland can secure itself as a future leader in clean fuel production and in doing so deliver lasting benefits for rural communities, consumers and Australia's energy security.

CHAIR: Clive, would you like to make an opening statement?

Dr Keenan: Thank you, Chair, for the opportunity to address this important inquiry into sugarcane bioenergy opportunities in Queensland. Wide Bay Pacific was formed in 2021 by two companies, my Bundaberg-based aquaculture consulting company and a female owned Solomon Islands seaweed company, with a vision to develop tested, sustainable algae-based industries to counter climate change using new technologies. Our initial work was with the macroalgae Asparagopsis, which grows naturally and abundantly throughout Hervey Bay. With considerable interest from the Bundaberg biohub and the Isis mill, our focus turned towards microalgae. Modern aquaculture has been growing many different species of ravenous microalgae, which consume carbon dioxide, for over 100 years.

Two thousand years ago it was reported that *Spirulina*, another microalgae, was grown in China, so it has been growing for a very long time. Microalgae carbon capture rates are known to be 10 to 50 times faster than terrestrial plants, capturing 1.83 kilograms, or approximately two kilograms, of carbon dioxide per one kilogram of dried algae biomass that is produced. To grow the algae we use waste streams of carbon dioxide and nutrient-rich water, both of which are available at no or low cost from sugar mills. It is very important to note here that we do not need the sugar itself and our farms will not interfere with the operations of sugar mills, so the growers will not be worse off and mills can have additional income. In addition, our products can go directly into renewable diesel and can be used as an input for sustainable aviation fuel.

For many companies there are very few effective options to reduce their carbon footprint and most of them do not really work—for example, carbon capture and storage (CCS)—and the alternative is buying carbon offsets. With appropriate investments, Wide Bay Pacific can scale algae production for massive CO_2 abatement for major industries like sugar mills, breweries and chemical manufacturers that produce greater than 100,000 tonnes of carbon dioxide annually. We can deliver sequestration and at the same time provide significant income from sustainable products and reduce the company's footprint by reducing their emissions. We can turn our customers' waste streams into valuable microalgae products which consist mainly of proteins and oils, which provide a vertically integrated and lucrative business with a potential to value-add.

I work as a part-time scientific adviser for a New South Wales based company, Sea02, which recently completed a $5 million microalgae farm at Woodburn in northern New South Wales. This farm is similar to the facility we could build at the Isis Central Sugar Mill—except the Woodburn farm

is saltwater based and farms at the sugar mills in Queensland will be freshwater based—initially growing extremely valuable *Spirulina* and *Chlorella* species. Investment is required to build a nursery system for algae production sufficient to enable pond seeding. We will refit the greenhouses, laboratory and insulated rooms at our Woongarra site as an algae nursery centre. We will start generating sales almost immediately and be profitable after the first two years. We are looking for initial development funding and investment from sugar mills. Thank you.

Mr MARTIN: You said you are looking for investment from sugar mills. Are you looking for investment from the state government as well?

Dr Keenan: That would be extremely helpful. We were initially planning to go into the Bundaberg biohub but the unfortunate death of Fiona Waterhouse really put us on the backburner. Since then we have been looking for a site to kick off our business. We recently found one, which is an ex marijuana growing facility at Woongarra, that has a lot of the things we need to get started. Investment from the Queensland government would be really helpful.

Mr MARTIN: Peter, could we get an opinion from the institute in relation to E10 versus E85? We heard from RACQ about potentially focusing on the rollout of E85. Is that something you support or are you agnostic on E10 versus E85? Does your organisation have a position on that, Peter?

Mr Blanshard: E85 fuel worldwide has proven itself as a great thing. Unfortunately, that horse has bolted. There are certain states in America that mandate E85 for their cars, and they have cars supplied to those regions that are E85 compatible. The ecoflex vehicle that we had in Australia that was predominantly built by Holden did not get a great hearing. The number of E85 service stations is limited. Without a doubt, running E85 when you have a compliant engine is certainly good for the environment. It is a wonderful fuel. It produces power, reduces CO_2 emissions and reduces the particulate matter that comes out the exhaust. It is good—but, no, there is no such thing as retrofitting a car because, as stated, with the way the metal is, embrittlement from ethanol use can happen. Corrosion can happen. All sorts of things can occur.

You really need an engine that has been already designed for E85. The world market at the moment is at E10, verging on E20, and, as I said, there are experimental states in America using E45. These engines are built and the primary mapping inside the computer is designed to optimise the E10. We look at the RON, the antiknock ability, the ability to run higher compressions. When you have mapping inside a computer that is looking for E10 fuel, it can allow that engine to have a higher compression ratio. It can put a higher advanced curve in, so the drivability, the power, just feels better all over and it can accept a fuel up to 94 RON, which is straight E10. When we are looking at our EVs—and we are talking about the range extended EV or the hybrid—there is only one manufacturer that does not recommend E10 in their hybrid in Australia, and that is Volkswagen, yet the same vehicle that runs around Europe is deemed to be E10 compatible. If you took that, you could say that every hybrid that has landed in Australia can drive on ethanol-based fuel.

Mr G KELLY: Peter, I would not take you on in an argument. You are across it all pretty well and very strong. Thank you for that.

Mr Blanshard: I think it is my 50 years in the automotive industry. I have not flipped hamburgers or pulled beers; I have lived and breathed the automotive industry.

Mr G KELLY: I can see that, Peter. Well done. Do you have any evidence of any E10 fuels with less than nine per cent ethanol being sold in Queensland?

Mr Blanshard: I personally do not, but I was told that there was insufficient testing done after the fact. There was some pilot testing. Back in 2014 and 2015 we were asked to help develop the E10 compatibility checker. In the time that we ran it, Queensland won an award for the highest public education campaign. We truly launched 'E10—the good fuel' in the south-eastern corner only. The then Palaszczuk government did not want to extend it to rural. It looked purely at the Brisbane and Gold Coast markets. We reached and educated, through the compatibility checker, over 680,000 people. It truly was a great thing. It resulted in a 68 per cent increase in E10 sales in that area. We were cut short on that. We were to roll it out through the rural sector because the rural community needed the same education. Unfortunately, there are quite a few of my peers who do not believe in E10. They say, 'Your car is going to stop. It's going to melt to the ground.' Gee, if it could melt, Sims Metal would be pouring it on all the aluminium and turning it into liquid. It does not do it. It has a corrosive nature and it needs to be handled correctly from an engine management point of view and from a fuel system point of view.

Our cars worldwide—the ones we built and the ones we import—have been built around this fuel since 2020, so we have 15 years of solid vehicles being able to run on E10 fuel. That is where we sit today. We need to get the message out. We need to dispel the myth that E10 is terrible for a car. If a car is designed and gazetted to be compatible, it is compatible. Look inside the fuel flap. If there is a sticker there from the OEM, the original equipment manufacturer, that says, 'This car is compliant with E10,' they did not lie, gentlemen: that car is compatible. We need to get that message out and dispel the urban myth that ethanol is terrible in motor vehicles.

Certainly you do not bring out your 1967 HR Holden and expect it to run brilliantly on ethanol. It was not conceived in 1967. There was no such thing as unleaded fuel and, indeed, unleaded fuel mixed with ethanol. That is not realistic, but if go and buy yourself a brand new Mazda or Toyota today—I do not care whether it is an ICE or a hybrid—you will find it is compatible with E10. That is the message we need to get out to rural Queensland. That same message that we got in the south-east corner needs to be spread across Queensland. Then watch your sales of ethanol enriched fuel grow.

CHAIR: Clive, in the couple of minutes we have left, could you talk to operational and set-up costs at the ponds at the mills and what that would look like if you were going to produce the algae associated with sugar mills?

Dr Keenan: We have done a feasibility study for the Isis mill. We would initially set up a 10-hectare site there, and as the income grows we can build additional ponds. They have 110 hectares adjacent to their mill. If we could access all 120 hectares, we could actually grow enough biodiesel in the algae to harvest the cane that goes to the mill. Algae consists of 30 per cent oils. You can extract the oils and you are left with protein and other valuable biologicals. If you can extract the oils and make biodiesel, you could actually fuel the harvest of all of the cane directly from the mill using its own biodiesel from about 120 hectares of ponds. That is what we have worked out.

Initial investment is probably around $5 million, similar to the SeaO2's farm at Woodburn in New South Wales. That is a marine farm. The one at the Isis Central Sugar Mill would be a freshwater farm, and it would be growing *Spirulina* and *Chlorella*, which actually retails from farms in Australia for about $200 a kilo. They are both extremely valuable products. There is a *Spirulina* farm in the Northern Territory and there is a *Chlorella* farm in northern Queensland. They are the only two farms growing those species in Australia.

CHAIR: Thank you very much for that. Thank you, Peter and Clive, for your time with us this morning. We really appreciate the effort you put into your submissions and the effort you have made to come in front of the committee. We wish you both all the very best.

CAREY, Mr Robert, Queensland Cane Agriculture and Renewables

DI BELLA, Mr Lawrence, Queensland Cane Agriculture and Renewables (via videoconference)

KERN, Mr Michael, Chief Strategy Officer, Queensland Cane Agriculture and Renewables

CHAIR: Welcome. I hand over to you to make an opening statement.

Mr Kern: I wish to thank the committee for inviting QCAR, a sugarcane grower representative organisation primarily based in the Burdekin, to address the hearing. My name is Michael Kern, QCAR's Chief Strategy Officer. I am joined by QCAR colleagues Mr Robert Carey in person and Mr Lawrence di Bella via Zoom. Outside of QCAR, Robert is also chairman of NQBE, a company which has a development approval to construct a new state-of-the-art renewable energy facility in Ingham. Robert is also chairman of Ethanol Technologies, which is commercialising second-generation cellulosic ethanol production technology, which has already demonstrated that it can convert biomass, including sugarcane bagasse and timber, into sugars within 10 minutes, which we believe will be leading technology that will support the development of the SAF industry. He can actually answer the question of how ethanol is made.

Lawrence, QCAR's Herbert district manager, also operates a private agricultural consultancy firm and a family sugarcane farm operation, producing about 13,000 tonnes of sugar cane as well as horticultural crops. He has over 35 years experience in the sugarcane industry and more recently with other agricultural industries like horticulture, cover crops, pasture and bioenergy crops like pongamia, agave, forage sorghum and Bana grass, and he has travelled overseas extensively visiting farms. With those skills and experience on offer today, and after I make some further introductory remarks and updates, I would strongly encourage the committee to ask as many technical questions as they wish on our submission.

First and foremost, obviously sugar cane is a no-brainer in terms of its suitability to provide a platform to lead the underpinning of a world-leading sugarcane-based bioenergy industry because it is a reliable, resilient, clean, green, renewable and cost-effective energy source, especially in light of the existing production quantities and the infrastructure that already exists which would facilitate feedstock expansion. There is a biofuels feedstock expansion study currently underway in the department which will hopefully confirm this. QCAR strongly urges the committee to ensure the findings and recommendations of that study are incorporated into the committee's report and the recently issued energy plan.

QCAR's submission highlights to the committee the long overdue and now urgent need to make a serious, scalable commitment to expanding the production of sugar cane and other appropriate renewable energy crops as alternative crops which will optimise the use of a farmer's land in an environmentally sustainable manner. The commitment we believe the sugarcane industry is looking for from the government is not a handout but a hand up to get things rolling in the right direction, including the centrepiece establishment of a Queensland bioenergy infrastructure fund to encourage investment in the future. However, such a commitment must contain the full suite of offerings that will ensure sustainability and longevity in a bioenergy industry including access to funds through a government backed infrastructure fund such as the QBIF; reduce red tape; provide financial subsidies, incentives, rebates, loan guarantees, tax credits and grants to investors and sugarcane farmers alike; and mandate engagement with sugarcane suppliers to ensure a fair and equitable recognition of and reward for product supply.

The committee's attention is drawn to the volatility of the world sugar price, which is incorporated into the cane payment formula. That price peaked at possibly somewhere around $1,000 back in 2023, whereas the sugar price earlier this month reached a five-year low of around $470 per tonne of sugar. Please keep it in mind that sugarcane farmers are price takers, not price leaders.

We need to learn from those who pioneered the way forward including Brazil, which over the last 50 years has blazed the trail for ethanol production in that country. Brazil's success can be directly attributed to government policies, investment, subsidies and mandates.

QCAR representatives heard firsthand last week at the State Development Townsville Industry Breakfast that Townsville, flanked by the Burdekin and the Herbert, appears to be destined to become the central hub in the expansion of a number of key industries including the bioenergy industry, as well as the planned expansion of the Defence facilities. In that context, notwithstanding the government's commitment to increased gas-fired generation, wind and large-scale solar and

increased storage, and while not specifically recommended in our submission, the state government should give consideration to building, owning and operating a pilot ethanol plant in Queensland located in Townsville, of course, to complete the supply chain for feedstock into SAF production and biodiesel production. The sugarcane industry has the ability to assist airlines and Defence to meet their fuel needs and provide baseload power, pharmaceuticals and building products while creating new industries, assisting the state and federal governments to meet their net zero emissions targets and assisting other companies to meet their environmental and sustainability targets.

In conclusion, QCAR implores the committee to give serious consideration to recommending through the minister and Treasurer to government that, like the CopperString project, the time has come to stop talking about making a commitment to invest in the development of a world-leading sugarcane-based bioenergy industry underpinned by the most reliable, resilient, clean, green, renewable and cost-effective source—sugar cane—and the expansion of current production.

Mr MARTIN: I just wanted to follow up on your submission, which is for the Queensland bioenergy infrastructure fund and the $3 billion commitment from the state government over three years. Can you share with the committee how you see that operating? Who decides where that $3 billion gets spent? Is it a board? Also, how does that investment work? Is it matched funding? Does the state get a stake in whatever it invests in? How do you protect the taxpayer in that situation?

Mr Kern: The intention of putting forward the QBIF was to try to align it to something equivalent to the NAIF funding—the Northern Australia Infrastructure Facility funding. We do not have a detailed plan on exactly how that would work, but we saw that as a similar fund in which people would make applications and there would be minimum and maximum amounts. You might appreciate that under the NAIF, for instance, there is a mandatory requirement to consult with the Indigenous folks in developing a plan. Similarly, there would be a mandate under the QBIF to consult with farmers and producers to make sure there is a fair and equitable acknowledgement of the supply of product and the reward for that.

What we tried to do in the attached table was compare how the NAIF works and how the QBIF would work alongside it. At this stage, there is no intention to try to actually draft the rules behind something like that. We are aware of the sovereignty fund that has been established. Whether that fund could potentially be renamed to focus on bioenergy infrastructure or whether there would be a brand new fund in its own right, we were not going to dictate that.

Mr MARTIN: Sure. I understand. The NAIF does have requirements for environmental outcomes, environmental protections. Do you support having similar environmental protections?

Mr Kern: I think those protections are already in place. Yes, they would be linked to funding requirements.

CHAIR: You mentioned the Sovereign Industry Development Fund in your submission and you highlighted some issues. Would you be able to give the committee some examples?

Mr Kern: I think the main part of our submission was that we got quite excited that sugar cane would be referenced in the energy plan as a key feedstock component. Unfortunately, the energy plan mainly focused on electricity and power generation and the use of coal, gas, solar, pumped hydro et cetera. It was not until the final page of the energy plan that it started talking about the opportunities for agriculture to participate in this energy process and the sovereignty fund. That was all.

We just felt there needed to be greater recognition in terms of sugar cane being able to make quite a significant contribution to electricity generation through the cogeneration plants. That was not recognised. There did not appear to be any opportunity to expand that, and we know that the Sugar Manufacturers have put forward a potential increase to their cogen capability from, I think, 380 up to 800 megawatts of power, which would generate electricity for half a million houses.

CHAIR: I acknowledge the member for Traeger has arrived. Welcome, Rob.

Mr KATTER: Thank you.

Mr SMITH: Gentlemen, thank you for coming in and for your advocacy in this space. A large part of today has been about investment into future biofuels and so forth. Right now, we have mums and dads across Queensland who are concerned about their energy bills. A big part of that also is our canegrowers and how they make sure they get a piece of the cogen pie. Have you looked into avenues where we can play with tariffs—for example, during the middle of the day the millers can get a higher price for what they are pumping into the grid and canegrowers can come in at a lower price

so everyone gets a little bit of a win and then you switch it off at 5 pm? Should we try to concentrate more on what we have, especially in government, in terms of how we ensure we can get better tariff opportunities for our canegrowers and our millers and ensure those mums and dads have a greater level of electricity supply into the grid which may bring down prices?

Mr Di Bella: At this stage, a lot of our growers actually do not get any benefit from the energy that is produced in the sugar mills. You are assuming that the guys who do are those who irrigate, but a lot of the industry does not get any benefit at all.

Mr SMITH: That is what I am saying, yes. How do we get them to benefit?

Mr Di Bella: There need to be changes to the cane supply agreement. The cane supply agreement is an agreement between the grower and the miller. At this stage it focuses on sugar and molasses, and the grower does not get anything at all at this time from energy. Robert, do you want to comment further?

Mr SMITH: I am very much across that. That is why I think maybe growers and millers need to come together and have a conversation with government and AEMO about how we can change tariff rates so there is a bit of a benefit in there for canegrowers. At the end of the day, they are producing a product that has been purchased and used for another reason in terms of cogen and they are not getting a benefit. Is there a path forward for growers and millers to talk with regulators about tariff changes?

Mr Carey: I think there is. We also have to recognise that the cane supply agreement, which Lawrence just said we need to change, very specifically says that when the cane is put in the bin on a siding that product, in total, belongs to the mill. You cannot talk about tariffs in isolation. I think it is a worthwhile conversation, but you also need to incorporate the changes to the cane supply agreement, which dictates the distribution of revenue.

Mr Kern: The other comment I would make—and I think Ash mentioned it this morning, or it might have been someone else—is that virtual pilot plants could be looked at and established. There could be an opportunity for electricity that is generated to be put into those virtual microgrids or plant operations, which would make it cheaper than what is available for the farmers to buy and which would be a greater revenue source for the sugar manufacturer. Those opportunities are good. Of course, I keep being reminded that, as much as you have water transmission loss, you have electricity transmission loss. When you put electricity down the lines into the grid and then it comes back again, you lose power. There certainly would be an opportunity to price that but not under the current cane supply agreement.

Mr DALTON: You mentioned in your submission a Kodak moment. Could you explain that to us and put on the record what you actually mean by that?

Mr Kern: A Kodak moment used to be a wonderful thing, a magical moment or an image that was captured by photograph. Unfortunately, a Kodak moment is now a reflection of a very bad set of management decisions and strategic failures by the Kodak company. In 1975, one of their technicians invented the digital camera. They put it on a shelf and said, 'We don't need that because we have 95 per cent of the market. Why would we need that?' Through a series of spectacular management failures, they did not focus on the right thing or realise that digital photography was a threat. All of those things were quite obvious at the time. They had a 95 per cent market share, so why would they need to change? I think that was in 2001. By 2012 they had filed for bankruptcy with a very low percentage share of the market.

In reflecting on this being a Kodak moment, everything seems to add up and tick all of the boxes as to why the bioenergy industry should go forward and why sugar cane should be an underpinning resource to drive that forward. I think it will be a greatly missed opportunity if we do not do it and if we are still talking in 10 years time about opportunities for sugar cane to lead the bioenergy industry.

Mr MARTIN: I noticed one of your recommendations is in relation to stamp duty exemptions. Would you be able to expand on that? What specifically would you be asking for from the state government? Is it a concession?

Mr Kern: There was a suite of recommendations in terms of rebates and so forth, including a first farm buyer grant. It would be in the same way that a first home buyer is afforded stamp duty exemptions at the moment. We could see a first farm buyer grant being made available. Obviously, we are not talking about a small amount; it would be relative to the size of the purchase and the farm. There is an opportunity then to give an exemption of stamp duty on the purchase of a first farm to either someone new and young coming in or, in fact, a new entrant to the industry.

Mr MARTIN: For?

Mr Kern: It would be to incentivise them to actually engage in the industry. At the end of the day, the biggest issue here in everything we are looking at is not displacing sugar production but expanding sugarcane production to feed into the bioenergy industry. We should do everything we can to convince people to come in as a new farm owner-operator, and the stamp duty exemption would be just one of those incentives.

Mr G KELLY: I know it is pretty exciting when something new comes in. I believe that there is a place for all sorts of energy and that cogeneration is very important. I have noticed with the wind and solar projects that we have developers coming out of the woodwork left, right and centre to stake their claim on different projects, different areas and different communities. Have you found that with where you want to go and what you want to do? Is the same thing happening to you? Are they knocking on your door saying, 'This is what we can do for you,' and promising you the world? 'Do you want to see how good we are and what we can deliver?'

Mr Kern: I will defer to Lawrence on that. He has certainly been exposed to a number of the doorknockers.

Mr Di Bella: There are a lot of people knocking on our doors at the moment wanting to work with us. We have to pick the right one. My biggest frustration is that we have lots of people. We need to start pulling it together and developing a strategy and a plan for this state and this country. It has been a long time. Robert and I have worked on the NQBE project and other projects. If we had a plan and a direction from government years ago, we would not be having this conversation today; we would already be on the road. Robert, do you want to make a comment?

Mr Carey: A lot of things have been said about the industry, and I think some context needs to be put around it as a generalisation. First and foremost, the existing canefarmers are not going to walk away from producing sugar only to produce, say, ethanol only. There has to be a balance in that process. That is the first point.

The second point is that, as a generalisation, most of the mills have incinerators to get rid of bagasse. There are a few that have produced electricity, but, by and large, they have incinerators. If you go overseas and look at what happens in Brazil and India, they have efficient boilers. What they do is produce excess bagasse. Once you have excess bagasse, you open up some opportunities—you can produce more electricity or, in fact, take it to another level using second-generation cellulosic technology. One of the companies I chair is very close to commercialising that technology. We have already demonstrated that we can take radiata pine or 168 different varieties of timber and convert it to sugar in less than 10 minutes. We are talking about a biofuels industry, which I do not disagree with, but once you have sugar there are 200 products you can manufacture, most notably biodegradable plastics, biodegradable chemicals and ethanol.

From the Herbert and Burdekin perspective, with Jet Zero and LanzaJet announcing their success last Thursday, Townsville's Jet Zero, or jet aviation fuel, is just down the road. We are not bringing it in from Brazil. That second-generation technology is also applicable to sugar and timber, so the timber industry and resources get to have a stake in that play. You still have the issue with the cane payment formula.

The other thing about converting sugar to ethanol is that under the existing technology it produces an enormous amount of dunder—waste—that has to be dealt with. It is a ratio of about 10 to one: to produce one litre of ethanol you have 10 litres of waste. You have to deal with it. With the second-generation technology there is no waste—none at all. That is the focus. It has been my focus for 20 years. We are very close.

CHAIR: Thank you very much, everyone. Unfortunately, we have to conclude this hearing. I thank everyone who has participated today. Thank you, Hansard reporters. A transcript of these proceedings will be available on the committee's webpage in due course. No questions were taken on notice. I declare this public hearing closed.

The committee adjourned at 12.17 pm.