

## CRITICAL MINERALS PROJECTS — INDUSTRY SUPPORT

### *Motion*

**HON SHELLEY PAYNE (Agricultural)** [1.10 pm]: I move —

That the Legislative Council commend the Cook government for continuing to support the Western Australian mining industry to explore for the critical minerals essential to a clean energy future.

This is a great opportunity today to talk about all the great work that the Cook government is doing to support the Western Australian mining industry, particularly exploration for critical minerals. I also acknowledge all the work we are doing to help transition to a renewable economy. We all know that we are very fortunate here in Western Australia with our abundance and diversity of minerals and that we host almost all the minerals on the critical minerals list, including half of the global lithium supply.

I want to talk about a few ways that the government is supporting our transition to a renewable economy, particularly in the mining industry. One of the great programs we have been running since 2009 is the exploration incentive scheme. Since 2019, the program has been funded through rents on mining tenements, which is a really fantastic way for that money coming in to go back into supporting exploration. Two things that the government understands is the need for continued investment in exploration and the ability to transition that exploration into mining. These are two things we will really need to face. Looking first at exploration, one of the programs under the exploration incentive scheme is the co-funded drilling program. I am pleased that this year we made a \$40 million investment in critical minerals, and some of that money went to expanding this co-funded drilling program. We are up to round 28, and round 29 will be the next one that comes out. We have put in an extra \$1 million annually, so \$7 million is available annually for companies to apply for over two rounds. It is interesting that in the most recent round more than half the applicants were searching for battery minerals. There were 33 successful applicants, and, as I said, over half of them were exploring for battery minerals, including lithium and rare earths. A lot of that rare earths exploration is happening in Esperance.

I want to take a moment to commend the Department of Mines, Industry Regulation and Safety for these programs, because they turn over very quickly. For instance, the last round opened at the beginning of August and closed at the beginning of September, and the miners and explorers found out only a month and a half later who the successful applicants were, which really allows people to get moving with the exploration work that they want to do.

I have probably talked about one of the rare earth exploration companies in Esperance, OD6 Metals, which was successful in the first round this year, doing a lot of exploration. I thank Minister Johnston for taking the time to meet with CEO, Brett Hazelden, when he was in Esperance a few weeks ago opening our brand new fast electric vehicle charger. He looked at the importance of some of these small exploration companies and took the time to chat to them about some of their exploration work and finds. As I have said before, the interesting thing about rare earths in Esperance is that they are not hard-rock based like the Lynas project in Kalgoorlie, they are in clays, so they may be easier to extract, and there is work going on looking at ways of extraction. There is a lot of activity. I think there are over 10 explorers drilling in the region. There has been a huge increase in drilling companies, particularly with exploration in the south of the state. So many projects have been helped through this co-funded drilling project. The drilling companies are super busy.

I was coming back from Kalgoorlie recently and ran into some guys in Widgiemooltha from Seismic Drilling Australia, the first Aboriginal-owned drilling company in Western Australia, who had been doing a lot of drilling there. The company was started by Dwayne Reynolds from Esperance. Last weekend, I also ran into Francisco, who is a geologist at EMU NL, which is another rare earth company exploring around Esperance. He was great at showing me all his profiling and how the company runs its drilling programs at a bigger phase before zooming in. All the levels and depths the company is drilling to was quite interesting. Mount Ridley Mines is another company exploring close to where OD6 is.

A lot of these companies really have positive working relationships with our native title organisations. It was interesting to talk to them about what they think some of the constraints are and what we are working on now, such as slashing green tape and things like that. Environmental approvals for some of these companies are a three-year process, which significantly limits getting projects off the ground. I am pleased our government is looking at how we can improve those things. The other issue is the future energy supply for some of these projects. Minister Johnston is keen for a lot of these projects to connect to the grid. We need to make sure that our electricity companies such as Western Power are adaptable and able to meet those companies' needs as they come along.

I have talked about the \$40 million investment, but another new project that is part of the exploration incentive scheme is the co-funded geophysics program, which is another great program that will start. There has been \$2 million allocated to this program, and the first applications will be taken in February next year. It aims to provide new

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information on greenfield regions of the state to get a better idea about what minerals are out there. I look forward to seeing what applications come in from some of these geophysical and mining companies under that program.

I want to talk bit about graphite because there are, I guess, four exploration areas in WA, and two of them are really close to Esperance—Munglinup, about an hour west of Esperance, and Springdale, which is close to Hopetoun on the coast. Graphite is a really important mineral. Members might not know that there is 10 to 15 times more graphite in a lithium-ion battery than lithium, so in an electric vehicle there is probably about 70 kilos of graphite. One project I want to mention is that of International Graphite, which is looking at mining in Springdale, which, as I said, is near Hopetoun. It has been really successful in some of the funding programs. First of all, it received \$4.7 million through the federal government's critical mineral development program. It also received \$2 million through the Collie industry transition fund. International Graphite has been working to set up a pilot plant and a research and development facility in Collie. The idea is for it to run its graphite plant in Springdale and do a simple crushing and flotation process to create about 95 per cent graphite and then truck it through to Collie, where it is creating jobs, and to process downstream to make really high quality battery anode materials. International Graphite's resources in Springdale are the second biggest in Australia and in the top 15 globally. This will be a very exciting project. It will be very good for Collie.

I want to mention some of the other stuff International Graphite is doing as well. It did some interesting projects last year with schools, the Einstein-First Project and the Quantum Girls Project, helping to encourage kids to get into science, technology, engineering and mathematics and look at building their future workforce. It did this program in Collie, Katanning, Ravensthorpe, Esperance and Kalgoorlie. It is looking to do the program again next year as well. I commend International Graphite for that work.

International Graphite's mine site is mainly on farmland, which makes things a lot easier environmentally. Mineral Commodities is another company close by in Munglinup that has taken a long time to get through the environmental approval processes. It has made its agreement with the native title owners. I hope that environmental approval process will be finished by the end of the year, allowing the company to get on with this graphite project.

I also want to mention Ravensthorpe. Most of the employees in Ravensthorpe work in the mining industry. Ravensthorpe is a small town with just over 2 000 people. Its economic output is worth \$1.3 billion. There is a really important lithium mine just outside town. Allkem Ltd is supporting Freight Lines Group, a local Esperance trucking company, by using it to truck spodumene to Esperance. This has been a really great project for the Ravensthorpe community. Yesterday, my first set of schoolkids had a trip to Perth, because obviously Esperance and Ravensthorpe are quite far away, and that was funded through Allkem, the lithium company. I was glad to host them for lunch yesterday with my colleague Hon Sandra Carr. It was a great opportunity for them to come to Perth and have a little bit of a look around.

I briefly mentioned the environment and I would like to make a few other comments on that. The locals in Ravensthorpe are really passionate. There are quite a lot of black cockatoos. Hon Stephen Pratt, who is away on urgent parliamentary business, is also passionate about cockatoos. Some of the mining exploration activity has to weigh up both sides. Bulletin Resources is trying to get a permit to drill for lithium quite near the existing lithium mine, but at the same time there is a lot of concern about the black cockatoos and the proximity to a national park. I think the government can get better at managing and working with companies to make sure that approvals can be streamlined, while at the same time looking at the parts of the environment that we want to protect and making sure that that is communicated to mining companies up-front. The company has done a lot of work to minimise any sort of damage that could occur. I also acknowledge that it is quite a special area.

Ravensthorpe Nickel Operation also operates close to Esperance. The mining companies in Ravensthorpe are doing a lot to give back to the community. A new youth centre funded by Ravensthorpe Nickel and Allkem Ltd is opening in Hopetoun. I used to think of nickel as something that is used to coat knives and forks, but we have about one-quarter of the world's nickel reserves, so this is a really important metal in the move to a renewable economy.

IGO Ltd is another company that works north east of Esperance and I want to acknowledge it as well. It is concentrating on battery minerals—lithium and nickel. It has also made a commitment to the Esperance community and always comes to the Esperance Show. Joanne McDonald, the company secretary, was at the show. It put a lot of money into the Esperance community during the COVID pandemic to help with social and economic boosts to the community; for example, it helped build capacity with our tourism businesses through some of its economic stimulus funding.

Another mine site that is operating east of Narrogin, which Hon Steve Martin would know about, is owned by WA Kaolin, which mines for clay. It has historically been shipped offshore to use for paper and making china and things like that, but more and more work is being done to extract the high-purity alumina out of Kaolin's clay. This is becoming more and more important. I want to commend the government for its feasibility study on the rail line from Wickepin to Narrogin. It is looking at reopening that rail line to minimise the number of trucks that come from the mine site. It is a huge clay reserve that will be open for many generations.

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I have talked about a couple of the issues that some of the mining companies are facing. I want to briefly mention water, which I know Hon Kyle McGinn will probably talk about when he talks about the goldfields. It is great that Minister McGurk has agreed to set up a water forum that will look at addressing some of the water issues in the northern goldfields, and Esperance might be able to help with that. About 20 years ago, there was talk of a desalination plant being built in Esperance, but it never went ahead. Some rare earth mines might need a chlor-alkali process to extract the elements, so they need to either truck salt or use brine. Who knows what kinds of opportunities there might be down the track for some of these projects if we keep our eyes open.

I also commend some of these mines for their initiatives for renewable energy. A lot of this is happening out Hon Kyle McGinn's way at Gold Fields' Agnew mine. Over half of its electricity requirement is being generated from renewable sources. Quite a lot of mine sites are now taking on renewable energy and are transitioning to wind and solar energy. With favourable wind conditions, the Agnew mine site can get up to 85 per cent of its requirement from renewable energy. It has transitioned a lot of its other mine sites to renewable energy sources.

Obviously, another issue is housing. Again, I want to mention the issue of power connection and our need to work with some of the mining companies in the south. A lot of the mining companies that are looking to come on are in existing communities, not in the north, and are looking at opportunities to connect. Rather than building mining camps a few kilometres from town, these companies want to leave a legacy by having their housing in the towns.

I want to talk quickly about workers in the mining industry. I love talking to members about my Uber drivers. As our critical minerals sector expands, having skilled workers is becoming increasingly vital. This morning, I met my first Uber driver who is a fly-in, fly-out worker at the Gudai-Darri mine. He works as a chef at one of Rio Tinto's newest mines. He had to say the name so many times to me. He is from India and trained as a chef in Melbourne, but obviously has to work in regional areas under his visa requirements. I asked him whether he wanted to stay or go back to Melbourne when he had met his visa requirements and he said that at first he thought he did, but now that he has been in Perth for a while, he really wants to stay, although he said that it was a little boring for him. I want to commend the Rio Tinto site. It is a multibillion-dollar investment. It is the first greenfield iron ore mine in over a decade and is one of the most technically advanced mines. It is amazing. I was reading about it.

I commend the government for the respect in mining forum that it ran in August this year. Hon Peter Foster was there. There was a huge showing from the mining industry. It was a great initiative of the state government and I commend it for some of the other programs that it is doing to address the issue of sexual harassment in the mining industry.

We are doing a review of our battery and critical minerals strategy, which is open to 4 December. This is really important and a great way for mining and exploration companies to give feedback to help us understand what support we need to provide to help expedite the development of our critical mineral resources. As I said at the beginning, we are doing a lot of exploration, but the real issue is the transition to creating and operating mines and looking at some of the downstream stuff. I talked about International Graphite and the fantastic work it is doing in investing in downstream processing, which will allow that sort of processing to happen in Australia so that we can have a quality product that we can sell, as well as ship overseas.

I think that is pretty much all I wanted to say, apart from talking briefly in closing about just how well the mining companies are doing. Our resource sector had record sales of \$254 billion last year. Lithium became the second most valuable mineral in Western Australia behind iron ore, with sales of over \$21 billion. The industry employs over 126 000 workers, which is really amazing. Things like nickel are among the highest levels in the past 15 years, at \$5.7 billion.

In closing, I commend the Cook government on all it is doing to help support the mining industry in Western Australia to make it the best in the world for environmental responsibility, and also for the work it is doing for the transition to the renewable energy economy.

**HON DR STEVE THOMAS (South West — Leader of the Opposition)** [1.30 pm]: It is the last motion of the year for us, so I will try to be a bit upbeat and positive today. It is not often that I accept that we commend the Cook government for anything. I thought that was perhaps one step too far, so I tried to find something positive to say out of this. I will say this in a positive bent: the Cook government is doing a better job than the Albanese federal government in this regard, so well done everybody! I feel a bit cautious, because if you read *The West Australian*, we are surrounded in the chamber by people who are on their way out, either by choice or not, so we need to be a little bit sensitive today. As someone who has come and gone once before, I can tell members it is not the most pleasant exercise.

**Hon Lorna Harper:** They'll miss you here today.

**Hon Dr STEVE THOMAS:** That is right. Members should not necessarily let it get them down.

I suppose that the motion's intent is reasonable in that it is to support the mineral extraction industries, particularly those rare earth and critical minerals that the world will need to transition to a lower-carbon economy. That is

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a reasonable thing for us to talk about. These things are absolutely critical. As I have said—I do not know how many times in this chamber—I am a believer in a transition to a lower emissions future. I have explained numerous times how, in my view, I think the government could do that better and its failures with the generation, transmission and storage problems that it currently has. However, it is nice to see that the government does intend to promote critical mineral exploration and mining, so that is the highlight of the day so far. Every government does this, because it is critical for the future of every country and the world, so it is good to see the focus on that.

Critical minerals in Western Australia are some of the greatest resources in the world—it is absolutely true. The question will be how efficiently and to what level we can extract those and get them into the marketplace. One issue is that Western Australia's economy is not very diverse; it is very much a mining economy. A midyear report will come out fairly soon outlining exactly how big that mining economy is and how much money the government makes out of it. We are not necessarily diversifying the economy a lot into other areas, especially around manufacturing. It is going to be very mining based. The reality is that there is no alternative. We are a mining state and will remain one for decades to come. It will be the most significant industry in Western Australia and, with all the best intent in the world, we will not be able to change that. I am not blaming the current or former state governments for the position we find ourselves in. It is the natural response to the wealth of resources that we have.

What the government has to get right is the capacity to extract those resources in a fairly rapid manner. There are some incredibly ambitious targets for decarbonisation around the world, most of which will not be met and are impossible to achieve. One critical reason for that is the government cannot get enough critical minerals out of the ground in the time frame to be able to deliver the infrastructure required to meet those decarbonisation targets. Batteries are a very good example of that. If the world were to decarbonise through batteries, battery storage and electric vehicles to support renewable generation, we would probably have to increase a hundredfold the extraction of things like lithium around the world. We simply cannot get enough of it out of the ground in a time frame that allows us to meet the current set of targets. Lithium may ultimately not be the be-all and end-all for storage. The prospects of vanadium is probably leaving lithium behind. The problem is that the vanadium industry is in its infancy compared with the lithium industry. The lithium industry is in its infancy compared with iron ore, and iron ore is in its infancy compared with gold. Therefore, it takes time to deliver those industries and build them up to a point at which they deliver the required outcomes. It means that they will be developing industries in Western Australia. Those industries will grow, and to some extent, do so irrespective of government policy. There is such world demand for those things that it is going to happen. I think it would happen whether governments on either side of politics wanted it to or not. Those things are going to occur. One thing we get a bit stuck on, particularly when in Parliament and around government, is that we start to assume government policy drives things. In the end, despite what people here think, government policy does not drive the economy. Most of the time it does not do too much to impact on things like interest rates.

**Hon Stephen Dawson:** That's far too cynical.

**Hon Dr STEVE THOMAS:** It does a little bit. It is not a fun Thursday yet; it is cynical Wednesday.

**Hon Stephen Dawson:** Government action can drive policy.

**Hon Dr STEVE THOMAS:** It has an effect. It does not necessarily drive outcomes, but it can have an effect. Normally, government policy is much better at having a negative effect on an industry than a positive one.

**Hon Stephen Dawson:** With the exception of COVID. If you think if it wasn't for government actions —

**Hon Dr STEVE THOMAS:** For COVID?

**Hon Stephen Dawson:** Yes. The actions that we took during COVID certainly drove the economy.

**Hon Dr STEVE THOMAS:** I suspect we would find that much of the mining sector would have managed its own risks irrespective of what government did. The government's job at the time was to work in conjunction —

**Hon Kyle McGinn** interjected.

**Hon Dr STEVE THOMAS:** Sorry?

**Hon Kyle McGinn:** The mining industry was under threat from the federal government at the time.

**Hon Dr STEVE THOMAS:** There was plenty of work being done to keep the mining sector.

**Hon Stephen Dawson:** Let's agree to disagree and I will get everybody to listen to you in silence.

**Hon Dr STEVE THOMAS:** I have said a few times that the government did not do a terrible job at managing COVID. It did a reasonably good job at implementing the health advice it was given. I have been fulsome in my praise of the government as much as I am prepared to be in that particular regard.

**Hon Kyle McGinn:** You were in Scotty's camp. Scotty's camp!

**The PRESIDENT:** Order! Enough.

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**Hon Dr STEVE THOMAS:** It is not quite a Thursday, President.

Government policy has some impact, generally more so on the negative side than on the positive side, but the industries are going to develop and it is critical that they do, particularly around the plethora of minerals that Western Australia has. Lithium has been our biggest success story. Lithium royalties were effectively almost non-existent a couple of decades ago and now it is on its way to \$2 billion—it is heading up there. It is going to be a significant contributor to the Western Australian economy and the wealth of the Cook Labor government going forward. The next \$6 billion to \$7 billion surplus will be partly on the back of iron ore and lithium. I will have to expand my Scrooge McDuck campaign because some of the critical minerals will be making a significant contribution, and lithium is.

Now let us have a bit of time to catch up. The private sector is driving this and it is doing a pretty reasonable job. I have to say that the government is doing a reasonable job at not getting in the way too much. I am full of praise for it today. A reasonable job of not getting in the way is good.

Again, I have to say that probably the biggest threat to exploration in mining development in this state comes from Labor's federal colleagues. I listened with great interest to the government's statements around streamlining the approvals process. It is always good to hear the government say that. I think the Premier—who is also the Minister for State and Industry Development, Jobs and Trade—was talking about those things in the not too distant past. He did it at an energy conference a week or so ago, and that is good to hear. I have been hearing that for the 20 years I have been in politics, but it is still good that it gets reinforced and put forward. It is harder to deliver than to say, so I hope that we will see some specifics going forward. I have taken this to heart. Members who were around a couple of years ago—the Minister for Emergency Services was—know that I tried to insert some statutory time lines into the approval process in the Environmental Protection Act. It was resisted by the government, so there is some onus on the government to try to make sure that the approvals process is streamlined as much as possible.

The issue the government faces in getting things out there is as much because of its federal colleagues as anything else. Right now, we have an Environmental Protection Authority in Western Australia. Over the years, it has not been perfect, but it has done a reasonable job. It assesses projects. We are also about to have a federal environmental protection authority. We went from a stage not too long ago when the state Labor government under Mark McGowan—gee, I have nearly forgotten his name already —

**Hon Stephen Dawson:** It is still Hon Mark McGowan.

**Hon Dr STEVE THOMAS:** Hon Mark McGowan—the minister is quite right; sorry. The state Labor government under Mark McGowan and the federal Liberal government under Scott Morrison were trying to streamline and coordinate the approvals process. I suspect that the Minister for Emergency Services, who was probably the Minister for Environment at the time, played a role in that.

**Hon Stephen Dawson:** With Hon Ben Morton.

**Hon Dr STEVE THOMAS:** Yes, with Hon Ben Morton, who was brought in to try to make it work. The problem, as I understand it, was largely the federal Department of Climate Change, Energy, the Environment and Water and its refusal to operate in a streamlined manner. This is not new. The proposal was simply that we would have concurrent approvals with sharing information; it would not necessarily be an automatic tick-off from one to the other, but at least things would operate in a concurrent and cooperative manner, but the federal department of environment was the problem. I know that Ben Morton was very keen to get that resolved, and then an election came along and he was no longer in Parliament. The problem is that Labor's federal colleagues under the Prime Minister have now gone completely in the other direction. They will now install a second EPA. In the not-too-distant future, a mining proposal in Western Australia will have to pass a state EPA and then, ultimately, under some sort of revamped Environment Protection and Biodiversity Conservation Act, will have to go through a federal EPA as well. The federal EPA process is likely to be longer and more troublesome than the state EPA process, so there is a problem here. Even with the best intent in the world to get critical resources and minerals out of the ground—which we all agree is important for not just us, but also the entire world and certainly the government's enormous budget surpluses—the reality is that the biggest issue facing the state government is its own federal Labor government.

It has two issues. The other one, of course, which it has managed to rectify to some degree but is still a problem, is the reversal of the Aboriginal Cultural Heritage Act. That probably took away a significant set of roadblocks for the next round of mineral development, but difficult negotiations are still to be had. Do not think for a minute that throwing out the Aboriginal Cultural Heritage Act after five weeks of operation has streamlined the approvals process, because heritage approvals have just gone back to an already very clumsy process. The government has those issues to deal with as well, and they will not get any easier. They will become even more difficult as time goes by. The best example of that is not critical minerals but an oil and gas project off the coast. Despite years of heritage consultation, apparently, one person was missed out and the courts decided that that person was not consulted

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adequately; therefore, the project is put back. Once the process of holding up projects through heritage is firmly established as a principle, it will go on ad nauseam. It would be ideal if the government addressed that in a fairly uniform manner. Something that government policy could genuinely do to have an impact on the extraction of critical minerals and an area that absolutely needs work is how to get past that level of the approvals process. It has to do that or somehow get the courts under control, and I am not sure how anybody does that, given the separation of powers principle. Some significant clouds out there need to be dealt with.

The government has done a bit in this direction, and the minister will probably stand and talk about some of the things the government has done. It has not all been bad; some of it has been reasonably good. We often support the good bits, which is good. As the opposition, we are here to help. In this era, we all accept that this must get better; we all accept that as we transition. I personally remain committed to the 2050 net carbon neutral target. I do not believe that it should be in legislation, because I think we will struggle to get there, but every now and then we get a step-change of technology and it becomes possible that we will achieve it. Let us be optimistic that we might get there and deliver it. That would be a good outcome. To deliver that, we will have to do a pile of things. We will have to create a pile of energy generation in higher technology and lower carbon futures. That is absolutely the case.

Unfortunately, as it currently exists, the state government's transition plan does not work, but I note that the government is slowly eking out and releasing little bits here and there. Its transition plan for the transmission of lower-carbon electricity was woefully underfunded. A probably \$3 billion, \$4 billion or possibly higher infrastructure requirement was completely unfunded. I note that the federal government has come in with \$750 million in the last couple of weeks as a result of that conference, so the government is probably 15 per cent or 20 per cent of the way there, but it is still unfunded.

As the coal-fired power stations are closed down, generation is completely unfunded. I have to say that the government's management of the coalfields is a disgrace and an embarrassment. As we discovered in the answer to a question yesterday, it has handed out \$40 million of free cash to a company that is insolvent and foreign owned and has no capacity to pay any of it back, just because the government has no idea how to manage the coalfields. Coal is a critical mineral that is in a disastrous state. It is in an absolute mess. The government has to invest significantly more to transition out of coal, and it probably will not. It has already extended the life of one of the coal units, funnily enough, to one month past the next state election so it can try to keep the lights on while we get to the transition point. If anything defines my cynical nature, it is my view of a government that extends an announced closure of a coal-fired generation unit to one month past the next election. It is not six or 12 months past or a couple of months before but one month past the next state election. I am absolutely guilty of some cynicism and sarcasm. It is one month past. As the government closes those down, it will not have enough generation, enough transmission and not even close to enough storage for that process. That plan needs a massive overhaul. It is dramatically underfunded and under-planned.

What will happen? I have said in this place before that I have great respect for the Minister for Energy. He will trickle and dribble these things out. He also got a run in *The West Australian* today. We will see whether he is here in the longer term to trickle it out a bit further; time will tell. He will trickle out these announcements as best he can. It is a patched-together strategy, based on a plan that is currently undeliverable. I wish him luck with it because he does at least understand and have the energy for the energy portfolio. He has an almost impossible job because he has to deal with the ideologues of the Labor Party who demand things that cannot be delivered. That has to be the focus of the government at the same time as the government is, to give it its due, developing the exploration and extraction of critical minerals. Obviously, it has a vested interest to do so because of royalties, but it also recognises, as the opposition does, that we must have in place those critical minerals.

One thing, for example, is silicon. Hon Shelley Payne, who moved the motion, went through a range of critical minerals, and I agreed with pretty much all the critical minerals she identified. Silicon is one that is suffering from potentially two government policies impacting on it, as with most critical minerals. The American Inflation Reduction Act 2022 has made billions of dollars available for projects in places such as Australia, and we will see a massive increase of private investment in critical minerals. That is one positive government policy. The biggest silicon producer in Western Australia is the Silicon Metal Company of Australia, and it relies on timber harvest to deliver the high-quality product. I suspect it will no doubt benefit from the Inflation Reduction Act in the US because people will need silicon for the transition, but this has been decimated by the closure of the forest industry in Western Australia. It is in with one hand, out with the other.

**HON STEPHEN DAWSON (Mining and Pastoral — Minister for Emergency Services) [1.50 pm]:** I rise to indicate that the government is supporting this motion this afternoon, and I am very grateful to Hon Shelley Payne for bringing the motion before the house. It was nice of the Leader of the Opposition to say some nice things about the government and to acknowledge that we as a government are continuing to support our mining industry in the state, particularly to help it explore for critical minerals. Western Australia is in an amazing place in terms of the significant transition that needs to take place as the world races towards net zero by 2050. We, as a state, are

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making a significant transition to clean energy, and we are indeed well placed in this part of the world to not only support the work the state needs to do, but also help the country and indeed help some of our new neighbours. The challenge is to decarbonise our state to help confront climate change and with that brings the opportunity of not only creating new industries, but also leveraging our natural advantages that we already have to become what could be a global force in renewable energy.

Both batteries and critical minerals represent an immediate opportunity for the state to leverage Western Australia's key strengths and traditional strengths of mining and mineral processing. It will also establish a new highly skilled workforce and industry that is focused on chemical and component manufacturing. The size of this opportunity is far greater than first thought. In his contribution, Hon Dr Steve Thomas mentioned the Inflation Reduction Act 2022, and that has been a game changer—if I can use those words—because it finally has people in the US talking about climate change. I think there probably has been countries around the world that have wanted the US to take action in this area for high on 12 or 13 years. Finally, as a result of this policy and this legislation, the US has shifted a gear and have well and truly made a significant effort into reducing inflation—obviously, it is named Inflation Reduction Act—but the benefits of it will be new, clean industry trends that will help the US and the world decarbonise.

**Hon Dr Steve Thomas:** The only issue is it is entirely debt funded.

**Hon STEPHEN DAWSON:** The shadow Treasurer has spoken! I will not make comments on how other jurisdictions fund their policies or, indeed, get into their domestic politics, but I will say that that decision is a game changer. In fact, I think the US put \$400 billion on the table initially, and that \$400 billion has already been spent. We have seen companies from around the world change focus; where they may have had projects in a number of countries, they are now focusing their decision-making on their projects in the US. In that regard, it is potentially challenging for some of us, but I think it creates many, many opportunities for us all, Western Australia included, by virtue of what we have here already, and that includes the critical minerals motion before us. I will get on to that more in a second.

In Australia, a diversified battery industry comprising mining, processing, manufacturing and recycling industries is forecasted to contribute just under \$17 billion in gross value added, and about 61 500 jobs by 2030, which is only seven years away. There will be massive benefit to the state. We have the second-largest lithium deposit in the world, which in 2021 was 28 per cent of global reserves. We are also the largest lithium supplier in the world, and we supply about 52 per cent of the world's lithium, so we are in the right place and have the right resource available to us. In 2021, one quarter of the world's nickel reserves were also in Western Australia, and we have the second-largest cobalt reserves in the world. We have vast amounts of manganese, graphitic carbon, vanadium, high-purity alumina, copper and other minerals. I have heard Chief Scientist Peter Klinken, AC, talk about the periodic table, and we have many, if not all, elements available right here in Western Australia. Over the last few years, we have seen Western Australia welcome major industry advancements in the mining and the advance processing of critical minerals. This also includes the construction and commissioning of large-scale battery chemical facilities as well as major investment in rare earth element refineries onshore in WA. These projects are a first for Australia in many regards. This has put us, as a state, in an enviable position because we have a local industry and local workforce that have the skills and experience needed to build and operate what are essentially complex projects.

Exploration activity has increased significantly since 2019, and I want to acknowledge the Minister for Mines and Petroleum, Hon Bill Johnston, who has been an amazing minister for these portfolios and has certainly made sure that we are taking every opportunity that we can in the mining and resources space to capitalise on the resources that we have in the state. We have seen a significant investment in the exploration activity taking place, and the government has backed an exploration incentive scheme. The EIS has increasingly been used for critical minerals exploration, and that has been a good thing. The EIS, as I said, has been operating since 2019, and aims to simulate private sector resource exploration through regional geoscience data acquisition programs and drilling. Further initiatives include transforming the state's vast repository of geoscience data to facilitate data-driven exploration targeting and a statewide passive seismic survey, which is currently underway, to help unlock more of the state's resources. These programs are supported by the \$40 million sustainable geoscience investment package that was announced in the 2023–24 state budget, and that was to specifically target increasing critical minerals exploration. The 2024–2030 strategy will consider what continued support can be provided to increase and expedite the development of our critical minerals resources here in this state. Certainly, from our perspective, supporting the mining industry to mine for critical minerals is a cornerstone of not only WA's, but also the world's transition to clean energy.

A couple of weeks ago, the Premier, Hon Roger Cook, addressed the WA Energy Transition Summit, run by CEDA, and I think it is important to place on the record in *Hansard* some of the comments that he made in his speech. I quote —

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We're at the point in time where there has never been more urgency to act, and critically, there has never been more agreement to act now.

I'm not going to lie, getting to this point has not been easy.

For years, decades even, a distracting debate has engulfed conversations around climate change and renewable energy in Australia.

...

But in recent years, there's been a shift.

...

Increasingly, the nation has witnessed what has been achieved with renewable energy elsewhere, and gradually, the switch to renewable energy revealed itself as basic common sense, not only from an environmental perspective, but also an economic one.

At last there is a will from corporations, from governments, and critically, from the public.

We're now at a point where the energy transition has never made more sense.

...

Our state is the engine room of the national economy.

...

WA is in a truly unique position leading into the energy transition.

If we could, just for a moment, take stock of our states' key attributes, abundant land, sunshine and wind, one of the highest uptakes of rooftop solar in the nation.

Beneath our earth, all the ingredients required to make a lithium ion or vanadium flow battery, a mining and resources industry with world recognised expertise and a skilled workforce.

A proven history of success in delivering projects of epic proportions.

And an impeccable record as a reliable and responsible trading partner, a world leading exporter of iron ore, LNG and critical minerals.

When you consider all of these factors, it's plain to see WA is fundamental to the green energy transition and global fight against climate change.

Yes, we have a responsibility to decarbonise our state, but our resources are so great that arguably we have an even bigger responsibility to help our neighbours to decarbonise as well.

With an energy transformation of this magnitude, and as we transition to net zero emissions by 2050, of course there are significant energy challenges that we need —

**Hon Dr Steve Thomas:** Are we calling it a “transformation” now, not a transition?

**Hon STEPHEN DAWSON:** It is an energy transformation.

**Hon Dr Steve Thomas:** Is that the election campaign slogan now?

**Hon Kate Doust:** It's better than the one you guys ran, isn't it?

**Hon STEPHEN DAWSON:** Let us not take me off course because I would hate to go back to the Liberal Party's energy policy at the last election.

**Hon Kyle McGinn:** Please do!

**Hon STEPHEN DAWSON:** No, I will not, but I think that the Leader of the Opposition and me probably have similar views on the policy that was taken forward at that stage.

**Hon Dr Steve Thomas:** My comments are already public.

**Hon STEPHEN DAWSON:** Correct. The member's views on the policy have been made clear previously, so let us not dwell on those. Suffice to say that with the energy transformation that is before us, and as we transition to net zero by 2050, there are significant energy challenges that we need to overcome. There is no doubt about it but it does not mean we should stop doing it.

Our main electricity grid, the south west interconnected system, is leading the way on a global stage. Last year, about 34 per cent of the energy generated was from renewable energy. Households in this state have also been driving the transition. Almost one in three households in this state have rooftop solar and industry is now joining

the switch. A lot is happening in the solar space. Demand in our main electricity grid could increase fivefold by 2050 and this will require more than 50 gigawatts of generation capacity and up to 4 000 kilometres of new and upgraded transmission network could be required. That is the distance between Perth and Singapore. Of course, this will not be cheap. As we have heard and seen, the government is making an investment into this infrastructure. The Pilbara alone will likely need about 50 gigawatts of generation and storage capacity by 2050. That will require more than 3 000 kilometres of transmission network. It is not an easy task ahead of us but the work has commenced.

If we look beyond the two main grids—the NWIS and the SWIS—decarbonising standalone mining operations and microgrids in the off-grid sector is even more difficult. The off-grid sector is home to many critical minerals that are needed by the rest of the world to meet their emissions targets. We need unique solutions for our unique landscape. There are some significant projects in the approval pipeline at the moment, which, once they come to fruition, will substantially lower energy prices, bearing in mind that energy prices in this state are substantially lower than our eastern states counterparts. It will mean that some of the projects that have been long thought about and wanted in this state will be made easier.

As I said, we need unique solutions for our unique landscape. That is why the Cook Labor government is taking the actions it is taking and is responding so strongly to the challenges that we face but is also trying to grasp the opportunities that exist before us at the moment. We are investing about \$3.8 billion in renewable energy, and generation and storage infrastructure. That will replace the state-owned coal-fired power stations that are being retired by 2030. This investment is already on the books and is happening. We are also investing about \$700 million towards improving our energy infrastructure. This funding will allow Western Power to move more quickly and start building the network infrastructure that is needed to enable industry decarbonisation to take place. Increasing the capacity will also help increase output from existing wind farms in the central and midwest regions. Of course, the minister has also negotiated a \$3 billion concessional financing deal with the Albanese government called Rewiring the Nation. It will help to fund the transmission bills over the years to come.

I also congratulate the minister for his work on the Pilbara industry round table where he brought together the major players in the region, who, for the most part, generate their own power at this stage but do it individually. They have not connected together. The minister brought those players together to explore options for common-use electricity infrastructure. The vision the minister and the government have is that there will be a shared grid that all those companies could deliver into. That would deliver low carbon electricity to meet increasing industrial demand while also maintaining system security.

Powering WA was mentioned earlier. It is a new policy announcement because the transformation that needs to take place is both large and complex. It will require an expert team of specialists to help manage the transition and the extraordinary scale of electrification that needs to take place. The team also needs to help and manage the speed at which it needs to be delivered. It needs to be project managed and its scope reaches outside of Western Power's current skill level. A decision has been made to establish Powering WA, which will be a new specialised entity. It will help coordinate the actions that need to take place to deliver the electricity infrastructure that is required to decarbonise between now and 2050. The intention is Powering WA will help streamline the development of transmission and renewable electricity generation and battery storage projects, which will need to take place over the years ahead.

The intention is also for Powering WA to engage with First Nations peoples and regional communities. Already in Western Australia we are seeing a number of traditional owner groups or Aboriginal organisations become partners in these new, big generation projects across the state. Yindjibarndi is one that has made a decision to be involved in a project, as has MG Corporation and Lawford Benning in Kununurra. They are also involved in a partnership to get one of these new, big projects off the ground. This, too, is a new way of operating. The investors and the financiers of the world want projects to have good environmental, social and governance credentials. They would prefer that the traditional owners of the land where the projects might take place be shareholders rather than get a royalty from the project. Some Aboriginal organisations are making decisions that will have them at the decision-making tables for these projects. The other thing that Powering WA will do is ensure that robust foundations are in place for investment in electricity infrastructure. As I said previously, the projects that will be required to take place are significant both in size and cost. Significant investment will need to take place to make sure we have the infrastructure in place.

There are exciting times ahead. The race is on to get to net zero emissions by 2050. As I have said and the Premier has said, we have an opportunity but there is also an expectation that we do some of the heavy lifting for the state and also the country. While we do that, we want to make sure we have a stable, low-carbon energy supply so that we can reach net zero status by 2050. As a government, we are committed to supporting Western Australia's mining industry and we want them to keep exploring for critical minerals because they really are essential to a clean energy future. Again, I congratulate Hon Shelley Payne for bringing this motion before us. It is a good one. It is important to remind ourselves of the opportunities that exist in Western Australia and the fact we have the minerals here in

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Western Australia that are not found in many other places around the world. We have a significant and safe economy. As I have said previously, we have the skills and the workforce here already to take up the opportunities that will be provided over the time ahead. Of course, our miners are world leaders in many regards. They are world leaders in automation, robotics and remote operations of mine sites. They, too, offer opportunities in other sectors, including our burgeoning space sector in Western Australia.

It is exciting times in Western Australia. We are keen to diversify the economy. We are keen to get new industries on board in Western Australia and, more importantly, we are keen as a state government. The Cook Labor government is very keen for us to play our part and to ensure that the critical minerals that exist here are able to be accessed in a timely fashion; our approvals processes are rigorous, but not laborious; and we work with our various stakeholders to make sure that we can mine these critical minerals as quickly as possible. I think the world is relying on us and certainly the state government is very keen to rise to the challenge. We are keen to work with international stakeholders and national governments to make sure that we play our part and that is exciting.

I thank Hon Shelley Payne for bringing this motion before the house. It is always good to have a motion on which the opposition says positive things about the government for a change. I acknowledge the contribution—most of it, some of it—from Hon Dr Steve Thomas. I thank him for acknowledging the great work the government is doing in the critical minerals space and I commend the motion to the house.

**HON KYLE MCGINN (Mining and Pastoral — Parliamentary Secretary)** [2.10 pm]: I, too, would like to commend Hon Shelley Payne for bringing this motion to the chamber. I know Hon Shelley Payne is very passionate in the environmental and renewables space and has been looking forward to having this type of motion debated in the house for some time.

It is good to rise as a member for Mining and Pastoral Region as well because a lot of people would be aware that my electorate plays a big role in this space—just like the minister who was on his feet before me. I will also have to clarify something for Hon Dr Steve Thomas. I think it was interesting because I know the mining industry was very thankful for the government's performance and the role it played during COVID, and I think the critical minerals space is no exception to that. We all know—just to have it on the record once again—what the former federal government wanted to do to our resources industry. It wanted to close it.

Let us be very clear that we are in a very good position because the state government was well aware of what would have happened if our resource industry was to shut. I think the government should be commended for the steps it took to ensure that that industry continued to operate. I also commend industry for what it did throughout that period with heavily regulated testing and all the things it did to ensure that it was safe in their workplaces for their workforces. That was a very tumultuous period, but I think the industry was very thankful that the government did not follow what the former federal government was going to do at the time. I know that the minister, like me, in the Mining and Pastoral Region would be very happy that we did not do that.

I want to talk about the goldfields. Obviously, we might even call it the critical minerals fields nowadays. Zing! It has been an interesting space, and it has been really interesting to follow it in the goldfields. When I first got out there in 2017, gold was obviously the huge conversation point. It was seeing a bounce back at the time, which is still going now, but gold, gold, gold was all that was being discussed. I had come from the Pilbara before that where iron ore was everything and so it was interesting to see the difference when I got to the goldfields and gold was the major player. When I arrived, the Nickel West smelter in the goldfields looked like closing. It looked like it had only a year or two left and it was going to close down. That was about 300 local jobs. One of the issues that arose was that over in China they found a new way to produce stainless steel that was not utilising the resource, and the situation was looking quite dire.

I am really proud to say that since then, with the bounce of critical minerals, Nickel West did a massive upgrade of the nickel smelter and secured it for long into the future and it is now playing a critical role in the critical minerals boom. It is absolutely playing a massive role. I have been out there to open days. I am not allowed onsite because I would have to shave my beard to put on the gasmask. I will not do that because I want to spare members in this chamber from seeing this face without a beard. I definitely want to spare the Leader of the Opposition from seeing this face shaven. I have been out there and spoken with Nickel West and BHP and the turnaround of that facility has been amazing. That has happened only due to this massive craze that is going to be the critical minerals race.

We are very well positioned in Western Australia and in the Mining and Pastoral Region and, listening to Minister Dawson, we are very well positioned as a government to ensure that we are ready for critical minerals. We are taking the appropriate steps to ensure that Western Australia benefits fully from what we are about to experience. Also, as always, we are very passionate about how we work closely with our First Nations people. I thank the minister for his words around taking that appropriate approach to working with traditional owners and

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putting them at the forefront of decision-making in that space. I think that is a very, very good and smart decision for us as a government to make.

When I hear about critical minerals, it rings so many bells for manufacturing opportunities. I would love to see Western Australia back in the spotlight and firing on all cylinders in the manufacturing space and having the opportunity to sell the goods as a finished product. I have seen so many industries in Australia that have turned back and gone basically to no manufacturing. It has been quite disappointing with the resources that we have in Australia. From a federal perspective I think there has been a bit of a change, but I think that manufacturing here in the state the best we can will only benefit Australia and Western Australian people.

If we look at the figures today on what is likely to be the gross value added per annum from critical minerals, we see that it is about \$16.9 billion and 61 000 jobs are forecast. In 2021, the prediction for that was half. We have seen growth double in the last two years just around what the world wants to see in that space. I know the minister touched briefly on the USA in respect of its hunger for critical minerals and rare earths now. I have had the opportunity to look into that and I had a discussion with the embassy in Washington DC about the legislative changes in America and how that affects my electorate because we have so many critical minerals.

There is some pretty heavy language when we start looking into American politics. I am not going to lie. It is interesting. But I did find just one excerpt that was from the Biden–Harris administration, which states —

*Companies Announce Major Investments to Expand Domestic Critical Minerals Supply Chain, Breaking Dependence on China and Boosting Sustainable Practices*

Like I said, it is colourful language. I just want to read out this section —

Executive Order 14017 ... *America's Supply Chains*, signed one year ago this week, ordered a review of vulnerabilities in our critical mineral and material supply chains within 100 days. In June, the Biden-Harris Administration released a first-of-its-kind supply chain assessment that found our over-reliance on foreign sources and adversarial nations for critical minerals and materials posed national and economic security threats.

In addition to working with partners and allies to diversify sustainable sources, the reports recommended expanding domestic mining, production ...

From talking to the embassy and listening to that language, I think there is a real hunger from the United States of America to find allies that are providing these critical minerals. The minister mentioned about \$400 billion, which is what they were talking about there. I heard that it could go up to \$1 trillion.

**Hon Stephen Dawson:** They have gone over that \$400 billion. It could go up to \$3 trillion.

**Hon KYLE MCGINN:** Not even six months ago, I was told that it was \$1 trillion and now it is up to \$3 trillion. The growth in this space is just unbelievable and Western Australia is at the forefront. We have cobalt, nickel, manganese and rare earths in the goldfields. We have almost all the critical minerals that the world is screaming for right now. As the minister alluded to, we have a mining industry that is proven, it knows what it is doing and it is a leader in the world in mining.

The minister mentioned automation. A lot of what has happened in that space was created in Western Australia. I just wish we built a lot of the automation systems here. It is absolutely great that Western Australians understand that companies and the government are focused on what they can do to be part of this global boom in the critical minerals space.

I am also a huge supporter, and have been learning about it since 2017, of the exploration incentive scheme. Again, the minister touched on it. It is fantastic. I want to go through some projects in my electorate, particularly those based in the goldfields. Some of these projects are in exploration, while some are in operation. The first project I will refer to, which I think a lot of members in this place will be well aware of, is Lynas Rare Earths Ltd. It is engaged in the exploration, development, mining, extraction and processing of rare-earth minerals. That project is worth about half a billion dollars. It set up a cracking and leaching plant just outside of Kalgoorlie. As far as projects go, working with the government and with the government acknowledging the seriousness of the situation, it flew off the shelf. Lynas engaged locally; it provided locals with jobs and engaged local First Nations organisations and businesses. The government absolutely understood the critical need for Lynas to get that facility up and running. It has been great for the local area.

I may have been saying in jest that the goldfields should be in the critical minerals field. It is diversifying from what was just a goldfield and just mining gold. I cannot stress enough that when I got out to the goldfields in 2017, I was told that gold was the reason everything was happening out there. Now I am hearing about cobalt, nickel, rare earths and cracking and leaching plants. There are projects everywhere in the goldfields. There are so many add-ons. Lynas has an interest in Mt Weld, a project in the electorate that develops and operates advanced materials

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processing and concentration plants. The Mt Weld deposit is one of the highest grade rare earth deposits in the world. Lynas processes the ore at the Mt Weld concentration plant to produce a rare earth concentrate that is sent for further processing at Lynas's Malaysian advanced material plant, which will be located in the goldfields. Getting to that next step in the supply chain locally is absolutely fantastic.

I have to give a massive shout-out to the member for Kalgoorlie, Ali Kent, who has worked tirelessly with industry and the government, pushing to ensure that we are front and centre. She has been working very hard with shires and industry around a goldfields industrial areas working group. At the end of the day, so many things need to be created so we can capture downstream processing and leaching and cracking. So many things need to be built up. She does a fantastic job fighting for it in that space, along with trying to get rid of hurdles that industry encounters so that it has the best opportunity to establish itself.

I will touch on Alkemy Capital Investments, owner of Tees Valley Lithium, up in Port Hedland, where the minister's office is located. It is a very good project. Again, it conducted a feasibility study to build a four-train lithium sulphate refinery utilising WA-produced spod-a-meen concentrate. I have heard —

**Hon Dr Steve Thomas:** Spodumene.

**Hon KYLE MCGINN:** I was going to say that I have heard Hon Dr Steve Thomas mention that. Alkemy plans to export the lithium sulphate for conversion at its lithium hydroxide plant in Wilton in the United Kingdom. It is fantastic to see more diversification in Port Hedland. No-one can ever judge Port Hedland for sitting on its hands!

Liontown Resources is located 300 kilometres north-west of Kalgoorlie. Liontown engages in the exploration, evaluation and development of mineral properties in Australia. The company explores for lithium, gold, vanadium, copper and nickel deposits as well as platinum group elements. Its flagship project is the Kathleen Valley lithium project, which is in the construction phase, with the company expecting its first production in 2024. Liontown is currently undertaking exploration and scoping works of the Buldania lithium project. Liontown is currently investigating opportunities to develop downstream processing capabilities. That is fantastic.

I touched on Nickel West. BHP Billiton, an Australian multinational mining company, has nickel operations in Western Australia. Its Nickel West operation includes Mt Keith nickel mine, Leinster nickel mine, Kambalda nickel concentrator, Kalgoorlie nickel smelter and Kwinana nickel refinery. As I said, when we got out to the goldfields in 2017, it was not looking very good but now it has been reinvigorated and things are looking better.

Alliance Nickel Limited is another company to note. So many projects are operating. They are just the ones that I have picked out. I do not think I will get through them all in the time I have left. If we do a bit of research, we see that critical minerals is front and centre, and that is just in the goldfields, in the Mining and Pastoral Region. Alliance Nickel engages in the exploration and development of mineral properties in Australia. It holds a 100 per cent interest in the NiWest nickel cobalt project located in Leonora. A pre-feasibility study has confirmed the technical and economic viability of heap leach and direct solvent extraction operations at NiWest out in Leonora.

Ardea Resources Limited is seeking to develop its 100 per cent owned Kalgoorlie nickel project. The KNP is located in the eastern goldfields and holds the largest nickel cobalt resource in Western Australia. The project has the potential to produce battery-grade nickel and cobalt sulphate. Ardea has signed a non-binding memorandum of understanding with a consortium of Japanese companies to conduct feasibility studies. It has feasibility studies underway now, which is really exciting.

Glencore engages in the production, refinement, processing, storage, transport and marketing of metals and minerals, and energy products worldwide. In WA, it owns and operates the Murrin Murrin project in the goldfields region through its subsidiary Minara Resources. The project consists of a major nickel-cobalt mining operation and includes a refinery.

I have just rattled off the names of a number of companies. The amount of industry that has been created through these companies, which is separate from the gold industry, which is still going strong in the goldfields, shows that so many smaller businesses can be started up or pre-existing businesses in the goldfields are benefiting from this boom. As Hon Shelley Payne said, it is good for the environment. It is the future and how we are going to see this world transition. WA is front and centre in that space.

I need to give a shout-out to the Shire of Coolgardie. The president and the CEO of the shire have done a lot of work in the critical minerals space. They have tried to bring industry out and show that they want to get ahead of the game. The surrounding shires are also supportive, including the Shire of Dundas, the Shire of Esperance, the Shire of Leonora, the Shire of Laverton, the Shire of Wiluna and the City of Kalgoorlie-Boulder. There is a huge press on. I give special mention to the Shire of Coolgardie because I know that it has put in a lot of work to bring industry together. The member for Kalgoorlie, Ali Kent, has been standing side by side with the shire, bringing industry in and making sure, as I said before, that any hurdles that can be taken out of the way are taken out of the way.

I know plenty of members want to talk on today's motion. I could keep going through projects, but I just want to say to Hon Shelley Payne that this was a great motion to move. It is really good to know that over the last six years there has been this huge change and diversification in the mining industry in the goldfields. The change in attitude from being heavily reliant just on gold has been really refreshing. I am not saying that gold does not still play a massive role in the goldfields—do not get me wrong, misquote me or cut my *Hansard*, which somebody might do—but having this massive add-on in the goldfields is fantastic. The future gains of this do not seem to stop doubling every couple of years. As the minister said, the USA alone is expected to spend \$3 trillion in that space. We can only imagine what China and other countries will look to invest. I have been closely following the Quad, and trade with India from a federal perspective has been a little bit more investigated. We can only imagine the need that India will have for our critical resources and minerals. I thank Hon Shelley Payne. I absolutely and wholeheartedly, from my electorate to here, support this motion.

**HON SANDRA CARR (Agricultural) [2.30 pm]:** I rise in support of the motion moved by my colleague and friend Hon Shelley Payne. I thank her for moving it. It is important and worthy of discussion today, particularly as we make the transition to renewables and a clean energy future. It is important that the government put forward some considerable investment to develop these new industries as a means to encourage some of our more traditional industries and bigger polluters to look at ways to transition or reshape the way they do things to make sure we can achieve the goal of a clean energy future, as is mentioned in the motion.

As we know, WA is already a leading supplier of battery and critical minerals. In June last year our now Premier, Hon Roger Cook, was the Minister for Tourism; State Development, Jobs and Trade; Hydrogen Industry; Science. At the time the government released a prospectus focused on the battery and critical minerals industries, and it appealed to investors around the world. It outlined how WA was essentially establishing itself as the destination of choice across battery and critical minerals value chains. That prospectus featured one such industry, which I will focus on today because it happens to be in my favourite patch the world, the midwest. It is Australian vanadium and it plays a role in batteries. As part of the transition to renewables and a clean energy future, battery storage is an issue. Vanadium has a particularly interesting role to play. It is perhaps one of the lesser known battery storage options at our disposal. It is a rapidly developing industry. I will talk a little bit about vanadium and explain its role for those who may not be aware, but also because retelling always helps me understand it a bit better. Australian-born vanadium redox flow technology is a homegrown electrolyte source. I will explain what I mean by “homegrown” in a minute. It is a product that is definitely set to bulk up our renewable storage options and may address some of the gaps left by lithium supply chains. We tend to focus a lot on lithium and batteries, but the role of vanadium is increasingly exciting. I say it is Australian-born because the inventor of the vanadium redox flow battery is an Australian chemical engineer, Emeritus Professor Maria Skyllas-Kazacos. In 1999, she was appointed a Member of the Order of Australia for service to science and technology, particularly in the development of the vanadium redox battery as an alternative power source. As an aside, she is a fascinating and incredible woman. If members have a chance, they should read through some of her published work and research. She has done some incredible things. I felt a little bit sad that the first time I heard about her was just after I had been elected. I was to meet with Australian Vanadium Ltd, so I started to do a bit of research about vanadium because at the time I did not know much at all. That is when I started to learn about the amazing Maria Skyllas-Kazacos. She is an incredible lady and an incredible Australian scientist.

I will talk a bit more now about the emerging role of vanadium in the energy transition and, in particular, in long-duration energy storage. That is an exciting thing about the role of vanadium. In September this year, our Minister for Mines and Petroleum; Energy, Hon Bill Johnston, presented a speech at the Future of Mining in Australia conference in which he highlighted Australian vanadium production and the investment by the Australian government to the tune of \$49 million. Additionally, VSUN energy, a wholly-owned subsidiary of Australian Vanadium Ltd, has vanadium flow battery market development. Western Australian regional energy provider Horizon Power has now signed a contract for the purchase, installation and commissioning of a redox flow battery in Kununurra. Vanadium batteries are very exciting because their temperature is resilient in harsh conditions, which Kununurra certainly experiences. They have long duration capacity and provide a stable energy source. The use of that long-duration energy storage in the form of VFBs—I will say “VFBs” instead of saying “vanadium redox flow batteries” because it starts to become a tongue twister—will be critical in accelerating decarbonisation, particularly for Horizon Power as it works to provide energy needs for those living in the north of Western Australia while decarbonising its network. That network covers some 2.3 million square kilometres.

I will talk a little bit about where AVL is at. It has a deposit near Meekatharra. It is a high-grade deposit. It has also purchased an option for a processing facility at a property called Tenindewa just outside Mullewa, which is quite close to Geraldton, conveniently located along the track. Anyone who has ever travelled along the east–west road from Geraldton right through to Meekatharra will know it is a very busy and productive route, with quads and trucks transporting all sorts of things to our incredibly busy and efficient midwest port in Geraldton. AVL has chosen its site very well in terms of where it can process for a number of reasons, which I will touch on in minute. Vanadium

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could be the answer, given that it has a long storage life and is a stable source of energy. It could be quite useful in terms of resolving some of the solar and wind production issues. When the sun is not shining and the wind is not blowing, there will be long-term storage that vanadium batteries can provide. We have some quite vast vanadium reserves, but most of the vanadium in the world is sourced through China, Russia and South Africa, and goes into making steel alloys. This is a rapidly changing environment and we can start to see the potential end-to-end chain from mine to electricity grid in Australia in particular. AVL is emerging as a really important piece in the renewable energy puzzle, and that really well placed project in the midwest is well established to meet our growing demand. The site is located at a tier 1, so low-risk, mining jurisdiction. As I said, it has a high-grade vanadium resource amenable to an industry-standard processing route.

I will talk a little bit more about the mine. It has the potential to produce 11 200 tonnes of vanadium pentoxide over its life, which is predicted to be about 25 years but with the potential to expand beyond that. The company describes the project as a pit-to-battery storage offering, with downstream processing and manufacturing potential. There is also the associated job creation that comes with it. As I mentioned, it will provide long-duration energy storage. Alongside that, vanadium is robust, nonflammable and scalable. Those things make it a really attractive option for an energy storage solution in our transition to renewables. The location of the processing facility just outside of Mullewa is particularly useful in that it provides easy access to the port for moving things in and out of the region. It is a well-established freight route. What the plant was established for is well known, and that makes it ideally located.

I will also mention that the construction of the company's first vanadium electrolyte facility in Perth is almost complete. In the last report I saw, which was last week, it predicted that it was about a week away from being commissioned. It is an any-day-now project. As I have talked about the location of the project being very close to the port, which allows for efficiency, it is probably worth noting the Cook government's \$350 million investment in the port to allow for the development and scale-up of projects like Australian Vanadium's. I know that Australian Vanadium was very excited by, and supportive and appreciative of, the announcement about the port by the Cook government and also the support and advocacy of the member for Geraldton, Lara Dalton, in ensuring that the port is scaled up and gets the funding that it needs so that we can meet the ever-growing demand in the emerging industries and the add-ons that are happening in some of the industries. For example, down towards Eneabba, Iluka Resources is about to step into reprocessing some of its slurry to access some rare earths. Again, this will be really important in servicing the need for components for renewable products.

I would also like to talk about some of the benefits of vanadium. I have five benefits; I like my fun facts. Vanadium redox flow batteries use a water-based, nonflammable liquid electrolyte. There is no risk of cross-contamination. Vanadium electrolytes in vanadium redox flow batteries offer a high degree of safety and reliability, which is particularly important in large-scale energy storage. If we are talking about large-scale energy storage and powering things, safety and reliability must really start to pick up particularly for regional customers. It is starting to promise some really exciting developments. We see that Horizon has taken up that option around Kununurra. The third fun fact is that recycling and re-using vanadium electrolytes directly contributes to the economic viability of vanadium redox flow batteries. This allows for lower level costs of energy over the lifetime of a battery, making vanadium batteries a more competitive option for grid-scale energy storage. We cannot say that that recycling and re-using aspect applies to lithium batteries. This is an exciting alternative. I know that the honourable Leader of the Opposition mentioned the progression and development of that material being far along the chain, and lithium is certainly on the front foot, hence the importance of people like me standing here and mentioning it. It is an industry that I am pleased to see both the federal and state governments supporting, because it offers some really exciting solutions. Western Australia is a vast state and it offers some great opportunities here.

**Hon Dr Steve Thomas:** I agree.

**Hon SANDRA CARR:** Thank you. It is lovely to have the honourable member's agreement. I think that might be a first for us. It is my lucky day!

**Hon Wilson Tucker:** It must be getting close to Christmas!

**Hon SANDRA CARR:** It must be getting close to Christmas—good point!

I have lost my way now. I was so excited to be agreed with across the floor.

The fourth fun fact is that recycling vanadium electrolytes in batteries can lead to a remarkable reduction in carbon emissions, and that is certainly something that we are all striving to achieve across the globe. They have a great application there. It has been estimated that the practice can result in a reduction of up to 78 per cent in emissions per megawatt hour of energy stored. That is a fantastic indication that shows us the potential of vanadium batteries.

The fifth fun fact is that unlike many other battery technologies, vanadium batteries exhibit a unique feature: their efficiency remains relatively stable regardless of the number of charge and discharge cycles they undergo. That is because the electrochemical reaction that occurs in vanadium electrolytes is highly reversible, so there is stability.

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Everyone knows that old diminishing return story. After a while, the battery does not charge as fast and it does not last as long. It is an issue that is less problematic with vanadium batteries.

As I wind up my discussion, I thought I would talk about some of the other applications that vanadium offers, because there are some interesting developments around vanadium. Vanadium redox flow batteries have been successfully used to power charging stations for electric vehicles. That is certainly an exciting development in the way that we transition and how we look at our fuel needs and the way that we get around. The quite substantive batteries for electric vehicles are highly disposable, so it makes it difficult to transition to clean energy solutions when we are creating another waste product in another area. That is an exciting development for vanadium.

This is more a fun fact kind of thing. Adding vanadium to steel makes it extremely strong and lightweight. It has been used in military applications, but it also allows for greater resistance in blasts and seismic shocks. It is good for vehicles and high-speed aircraft. I think it has been used in spacecraft and things like that. If a product is resilient and durable, it is going to last longer. If vanadium is added to or blended with things, it can create a product that can be built to last or to last longer, unlike many things that we encounter these days. Panasonic North America already uses vanadium in some of its coin batteries—those terrible batteries that we do not want our kids to get their hands on because they can cause all sorts of issues if swallowed. It is already using them, so if people have a Panasonic product, it may already be in the remote control or an electronic device. Vanadium may be closer to people than they think.

This is another fascinating potential application for vanadium that I was reading about. It has been explored for its potential antimicrobial properties. When it is blended or combined with fabrics, its compounds can help inhibit the growth of bacteria, fungi and other micro-organisms, which is quite fascinating. I appreciate that I am fully nerding out here. I have gone right down the vanadium rabbit hole! I put my hand up and I am willing to admit it.

**Hon Darren West** interjected.

**Hon SANDRA CARR:** I am going to start the vanadium party next week!

**Hon Wilson Tucker** interjected.

**Hon SANDRA CARR:** I believe the honourable member is looking for a party, so we will talk later!

The fascinating thing about its capacity to inhibit the growth of bacteria, fungi and other micro-organisms is that it has some amazing potential applications in the health field. If it is in clothing, curtains and those kinds of things, there is a huge potential to decrease infection risk in a hospital or health context, which is a really exciting development for vanadium.

I thank the honourable member for bringing forward this motion today. I am in fierce agreement that our investment in critical minerals, particularly for batteries and storage, will allow us to address some of the large polluting and more complex fuel sources that we are using at the moment and some of the more complex practices that we use those fuel sources for. Hopefully, it will help us to exponentially develop those industries and see a significant change, and we will have this nice compounding effect once all these industries find their feet and technology catches up with us. I would like to have talked about hydrogen, but time has not allowed for that. Those industries will allow us to rapidly transition once we hit our straps with those kinds of things.

I thank Hon Shelley Payne for bringing forward this motion. It was a really nice opportunity to recognise the Cook government's endeavours to make sure that WA plays its part not only within the state, but also in the global transition to a clean energy future—I emphasise the word “future”—for all people. I think we are playing our role and are recognising and understanding what our role is as a state not only in looking after ourselves and our state, but also in a global collaboration to ensure that we all work together so that there is a clean, optimistic future for our young people and future global citizens. I thank Hon Shelley Payne.

**HON DAN CADDY (North Metropolitan)** [2.49 pm]: I will go for 10 minutes. I will do my best, anyway.

This is a fantastic motion brought by Hon Shelley Payne, and although it hones in on rare earths specifically, I will concentrate on the last four words of the motion and pick up on a couple of things that Hon Sandra Carr said. The last four words are: “a clean energy future”. I will talk broadly to this theme, because it is the crux of everything. It is a clean energy future not only for WA and Australia, but also the globe, as pointed out by Hon Sandra Carr. Within this framework, it is important for Australia, and Western Australia more specifically, to also help our neighbours in India, China and Indonesia—to name a few, but there are many others—in their endeavours towards a lasting solution through a transition of their energy and sometimes their manufacturing sectors as well.

I have spoken in this place before about the wind turbine industry, its history and how it happened in Denmark. When we talk about hydrogen in Western Australia, or the value chains of critical minerals, we can really be in at the front end and keep that knowledge here. I have spoken about hydrogen on more than one occasion. I am a firm

advocate for establishing a green hydrogen industry in Western Australia. Indeed, my highly esteemed former colleague, Hon Alannah MacTiernan, often spoke about hydrogen in this place and continues to be one of the biggest advocates in the state. She would be very glad that this motion has been brought today by Hon Shelley Payne.

I will talk a bit about hydrogen and pick up on that, because just as rare earths are essential to a clean energy future, hydrogen technology, supported by renewable energy at the front end, also presents a really clean energy source for the future of Western Australia and the world. We have been a world leader for the best part of 50 years in the export of resources and minerals around the world. Hon Alannah MacTiernan pointed out that if we get this right on hydrogen, there is a huge economic benefit to Australia as well. The value of Australia's low emission hydrogen exports could be over \$2 billion by 2030 and nearly \$6 billion by 2040. Compare that \$6 billion with our wool exports a few years ago, which were only \$3 billion, and our wheat exports at the time, which were \$5 billion. As well as hydrogen heading and helping transition Western Australia, Australia and the globe towards a clean energy future, its market in an economic sense would not be insignificant.

Right at the start, I touched on one of the more compelling reasons to keep going down the hydrogen path, which is the opportunity to become a world leader in this industry. I have spoken in this place before and say again about what happened with Denmark's wind industry and how it now pretty much controls the wind turbine production industry, and its intellectual property, around the world. This is relevant to us here with hydrogen. Like I said, it is also relevant to rare earths, especially if we get the value chain right. I was recently speaking to Hon Bill Johnston about opportunities for gold hydrogen, which is interesting in itself. There are many shades of hydrogen: green, gold and white. However, I found gold hydrogen especially interesting.

Members will also be aware of the many professionals in their field who come in to this place and provide briefing for members who either have the time or the desire to go. This group is led by Geoff Baker, MLA, the member for South Perth, and Hon Dr Steve Thomas. In recent weeks, we have had many opportunities to hear from industry leaders. One was on using hydrogen to support the green steel industry. In that briefing, I note that of the 10 steps outlined to us, from the initial drilling through to the shipping, the iron-making step is responsible for almost all the carbon emissions in that value chain. It was an extraordinary presentation that very quickly showed where and what we can concentrate on to bring down emissions.

We also heard from a company called Carbon280. An issue Hon Dr Steve Thomas often discusses when we talk about hydrogen is that it is limited to being an energy storing mechanism. I disagree. I do not think it is limited to that, but to a certain degree, I see the point that the honourable member makes. We were briefed on a new product, and I think the name of it was Hydrilyte. In my opinion, it has taken hydrogen storage to a new level both in capacity and safe means of transport. More importantly, at the end of the transport process, the extraction of pure hydrogen is what I would describe as best practice. It does not require further purifications like some storage mechanisms do. That is a significant issue and cost as well. In its early days, this product has attracted investment from Woodside. The technology and knowledge around this at the moment sits with a small Western Australian company, which is super exciting.

I will finish off and leave some time for my good friend Hon Wilson Tucker to have a chat. I will talk about Victory Metals and return to rare earth. Victory Metals is a small mining company based in Western Australia. I am sure most members have probably not heard of it. It is now Australian Securities Exchange listed. The CEO is a bloke called Brendan Clarke. I do not know him, nor do I have any connection to the company, but it is exciting to look at what it has. It currently has Australia's largest heavy rare earth clay deposits. This is impressive because members know heavy rare earths are by far the most valuable. This deposit on its own has metals required for a whole range of things, such as lasers; X-rays; metals required for electric vehicles; semi-conductors; nuclear reactors—Hon Louise Kingston would be pleased to know—wind turbines, and many other defence applications.

I am watching the clock, but in the short time I have left, I pick up what Hon Stephen Dawson said about how WA has the second-largest cobalt deposits in the world. This is another issue with critical minerals, and Hon Sandra Carr talked as well about WA being a global leader in this space, because we do have the second-largest deposits of cobalt in the world. The largest deposits in the world are found in the Democratic Republic of Congo, and they are nearly three times as large as the deposits we have here. In fact, its deposits are larger than the next 10 countries, including Australia, put together. I highlight the real issue I have—I hope I get this right—which is that I believe the Democratic Republic of Congo, on certain poverty scales, is considered the second-poorest country in the world. This is a real issue because there are massive mines there. There are massive problems with what I would refer to—and probably not technically correct—as slave labour or cheap labour. There are a lot of people who live on the edges of these mines, and of the 19 large cobalt mines in the Democratic Republic of Congo, 15 of them are owned by China. This is an issue because of the way workers are treated there. We need to be a world leader in this way. We need to not only make the most of our own reserves, especially through improving the value chain, but also use all the diplomatic mechanisms and everything we have to seek to change this outcome for the people of the Democratic Republic of the Congo. My great fear is that once all the cobalt is mined, the people will be left

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simply with a lot of giant holes in the ground—these things are like the Super Pit—and nothing to show for it. We need to not only do our part as a nation and as a state in dealing with our carbon emissions, but also be a leader on the world stage and help others, which in turn helps everybody, by bringing that economy up through working with diplomatic allies. Every economy as it advances is more and more on the road to a clean energy future. That is what this is all about, so we absolutely need to be a world leader on that stage as well.

**HON WILSON TUCKER (Mining and Pastoral)** [3.00 pm]: In the short time I have, I will sidestep the praise of the Cook government element of this motion, as I would like to share some thoughts and experiences about the resource sector and critical minerals in Western Australia. We know that the resource sector is a massive contributor in WA. When we talk about the Mining and Pastoral Region, the name is really on the tin for what goes on there, with mining being far and away the largest industry and contributor to gross domestic product. I believe that the resource sector in WA contributes about \$99 billion to the Australian economy, but I am happy to be corrected by the Leader of the Opposition if he has some more up-to-date figures. Perhaps he has a chart or a graph that he would like to table.

**Hon Dr Steve Thomas:** If you are talking about the entire economy, it is a bigger number than that. The \$99 billion is probably to the federal economy.

**Hon WILSON TUCKER:** Okay. It is a very big number. We have over 100 active mines. If we talk about critical minerals and rare earths, the goldfields is obviously a very important player. In 2021, I was fortunate enough to visit the Lynas Rare Earths processing facility that is based out of Kalgoorlie. I have to thank Lynas for its hospitality. It picked up the top gong at the Diggers and Dealers Mining Forum awards in 2021 when I attended. I have to give myself kudos; I think I was the only member of Parliament who stuck around for the entire conference and listened to a lot of the speeches. A lot of members just swanned in for the evening drinks at the end of the day. Lynas has given me an invitation to visit the Mt Weld mine, and it is something I hope to take up in 2024.

I have admittedly been critical of the resource sector in the past. That is more about oil and gas, but I think that gas has a role to play in the transition to a green energy future. I also think that the resource sector has a larger role to play in giving some of the wealth and profit back to WA through federal taxation and state royalty regimes. Previously, I talked about a super profit or windfall profit tax that would come into effect only for high profits beyond operating costs. Especially in the gas industry, a lot of profits go overseas. In comparison with other industries, it is not a big industry in WA as a bottom-line contributor, but it gets a lot of tax breaks and concessions in WA, and that completely and constantly surprises me.

We know that it is important to diversify our economy, and critical minerals help to diversify our export portfolio. That is good. When we talk about diversifying our economy as a whole and really leveraging what we are good at in the mining sector, there is a real opportunity. WA is a leader in automation, robotics and remote operations capabilities. The adage is that if a mine site in the Pilbara can be controlled from the Perth CBD, which is a couple of thousand kilometres away, it can basically be done anywhere. It can be scaled up to any distance on the planet and sometimes off the planet. We know that NASA is interested in our low-latency, high-availability capabilities and infrastructure that is produced here in Western Australia.

Throughout the pandemic, a lot of mining companies invested very heavily in automation, and some mining companies saw a productivity increase of about 20 per cent by investing in automated haulage and drilling. Through that investment, they are increasing the digital footprint of their operational technology network, which is separate from their corporate network. There is a conversation about the cyberthreat that that poses, but a lot of homegrown capability has been created and could be leveraged in WA and taken out of the resource sector. The resource sector sometimes falls into the category of just digging things up and putting them on ships, but we all know that a lot more happens behind the scenes and beneath the surface and could be leveraged in other areas.

I am very conscious of the time, so I will leave my remarks there and let Hon Shelley Payne have the right of reply.

**HON SHELLEY PAYNE (Agricultural)** [3.04 pm] — in reply: I thank Hon Wilson Tucker for allowing me a bit of time for my response.

I thank members for their contributions today. I particularly thank Hon Dr Steve Thomas for his support of what the government is doing. We are working very hard, so it is great that he acknowledges that. I know that a lot of his colleagues talk a lot of crap, but I want to acknowledge the way he commends us when we do things. He speaks in a very constructive way, and I commend him for that. I have been wanting to do that all year, in fact.

Moving on from that, I thank Hon Stephen Dawson for his response on behalf of the government. He mentioned the Energy Transition Summit, our need to act and how there has not been a time until now when there has been an agreement to act. Particularly, we have a role to play in helping our neighbours to decarbonise. I heard comments from Roger Cook about China wanting to move away from coal, but that will not happen without us being able to provide it with our gas. We need to work on a global scale and have the potential to help the global economy

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decarbonise. Hon Stephen Dawson talked about PoweringWA. Setting up PoweringWA was a great initiative to help transition our energy infrastructure for the future as we move to renewables. A huge amount of money has gone into that—for example, the \$708 million that has gone into the south west interconnected system network—as we transition to net zero by 2050. Hon Stephen Dawson also talked about us being world leaders in automation and remote mine sites. A lot of members talked about the global example we can be for the mining industry. Hon Dan Caddy talked about the Democratic Republic of the Congo and our potential to lead in the way we do things.

Hon Stephen Dawson wrapped up by talking about how we are really keen to diversify the economy to get new industries on board, to assist mining companies to extract the minerals, to make sure that our approvals are rigorous but not laborious, and to get mines going as quickly as possible. The government is really keen to rise to the challenge of working with our international stakeholders.

I pick up on the good comments made by Hon Kyle McGinn, particularly about COVID and the huge amount of work we did to keep our mining industry going. It ran our whole country and kept us and our economy going. I commend the former McGowan government for that. He also talked about working with traditional owners and putting them at the forefront. I am really proud of a lot of the work that we and the mining companies are doing with traditional owners. He talked about the goldfields industrial area working group and the work that Ali Kent is doing. I mention the Goldfields–Esperance Development Commission and its support because it is helping Esperance to look at more industrial land. I did not mention or pick up on this, but it is important to make sure that we have industrial areas so when we want to do further downstream processing, we have areas to do it in and we can promote that.

I thank Hon Sandra Carr for educating me about vanadium because that was not something that I had looked at. I thank her for telling the house about vanadium redox batteries and their importance for long-term energy storage. Horizon Power has committed to an energy storage pilot in Kununurra using vanadium batteries. The first commercial one is in South Australia, and I think that is cranking up pretty soon. It is a stable energy source. She talked about going down the rabbit hole of its antibacterial properties, but it is interesting. The running shirt that I wear has silver in it. When my son burnt his foot, the silver in the bandage helped healing, so I think it is important to research this area. She also talked about Iluka Resources' reprocessing, which is happening. It is great when technology improves and we can do a lot more of the downstream processing and waste processing. A lot of that is happening in some of the newer mine sites; they are looking at processing the tailings, and that is really something we can work on.

Finally, I want to thank Hon Dan Caddy. He is always passionate about a clean energy future, and I knew he was going to mention windmills in there somewhere! He also talked about us having the second-largest cobalt deposit. Interestingly, the Ravensthorpe Nickel Mine, near Esperance, produces nickel–cobalt hydroxide.

Question put and passed.