

CARBON EMISSIONS

Motion

HON DR BRAD PETTITT (South Metropolitan) [10.12 am] — without notice: I move —

That this house notes —

- (a) the worthwhile work underway on Western Australia's Sectoral Emissions Reduction Strategies, expected to be released late 2023, and the longer term aspiration for net zero by 2050;
- (b) that Western Australia's current actions to reduce carbon emissions this decade are not consistent with the recommendations of the Intergovernmental Panel on Climate Change, the Paris Agreement and the latest climate science—all of which demonstrate emissions need to reduce by 50 per cent of 2005 levels by 2030;
- (c) that Western Australia has exceptional local and global economic opportunities that can be enabled by early actions to achieve a net zero economy; and

calls on this government to —

- (1) accelerate its ambition this decade on climate action so Western Australia's whole-of-economy carbon emissions reduction actions are consistent with the climate science;
- (2) as a priority, immediately increase investment in a range of climate actions at scale initiatives in renewable energy, clean energy storage, energy efficiency and electrified houses and transport that will reduce carbon emissions quickly and cost effectively in Western Australia;
- (3) identify funding opportunities to ensure that low and middle income households can access and benefit from these initiatives; and
- (4) commit to transparent and timely annual reporting on Western Australia's greenhouse gas emissions, including by sectors, consistent with IPCC reporting.

I have stood several times in this Parliament to talk about climate action and why we need to act with much greater ambition and urgency than we are. I will not repeat this because I have said it several times, but, without a doubt, as the motion says, WA's current actions on the climate are inconsistent with the science. In fact, as the only state with rising emissions and without either a 2030 emissions reduction target or a renewable energy target, we could say that WA is the worst performing state in a country that is the worst performing country on the planet on climate action. Whilst we do this, we continue to actively seek fossil fuel expansion, running directly against the climate science. Being the biggest fossil fuel exporter in the country is not something that we should aspire to, or be proud of, in light of the climate science.

This motion is about solutions and about how this state can do better. There are solutions that we can do now. There are solutions that can reduce emissions this year and every year this decade. There are solutions that will save Western Australians money and make our cities, suburbs and towns better and more livable. This is at the heart of the motion. Although WA is going to be one of the places hardest hit by climate change, it is one of the places that is best able to benefit from the low carbon transition before us. We are extraordinarily lucky. We have some of the best placed resources. We have land, sun, minerals and smart and skilled people—all which will help us make the transition that we need to make.

I bring this motion to the house in the context of an important report that came out this week. Members will be aware that the IPCC's working group III report focuses on mitigation and the solutions that we need to be in place if we are to have a safe climate and keep global warming as close as we can to 1.5 degrees or definitely under two degrees. The working group III report comes off the back of the working group I report that came out last year, which was about our current status. Last month, I talked about the working group II report, which was about climate impact, how bad it is, what we need to do to respond to it and what adaptation is required. This latest report is in many ways most interesting because it is about the solutions—the things we can do and the pace and scale at which those solutions need to happen. It is an amazing report and I encourage people to read it. It was developed by 278 authors in 65 countries. It has been called the last comprehensive assessment of climate science to be published while there is still time to avoid the worst ravages of climate breakdown. This report matters, and today I respond to the report and what it might mean for Western Australia.

The message at the heart of the report is that the world is not shifting quickly enough to a low carbon economy. However, it is also a report of optimism because it says that although we not shifting quickly enough, we finally have the technology and the tools that we need to do it, like we have never had before. In fact, responding to the

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climate challenge a decade ago was much harder than it is today because we have seen some incredible things happen over the last decade. We have seen the price of solar come down 85 per cent. The price of wind has come down 55 per cent. The price of batteries has come down 85 per cent. For the first time in human history, we have everything we need to move quickly to a sustainable economy that can give us a safe climate. But—and this is a very big but—we need to accelerate that action, and that is at the heart of this report. We need to accelerate that action, we need to do this at scale, and we need to invest now because this decade is the decade that matters.

Today I want to put in front of the house nine quick wins for our climate. They are quick wins for not only our climate, but also Western Australians because they will save Western Australians money and make Western Australia an even better place to live. It is a win-win. For me, the exciting thing this time is that we can do this. We are better placed than many to do it. We just have to get on and do it.

I will talk about transport, households and some of the infrastructure that sits in between them. I will start with transport with a good quote here from the IPCC. It states —

Electric vehicles powered by low-emissions electricity offer the largest decarbonisation potential for land-based transport.

Electric vehicles are where it is at. The first of nine quick ideas in nine minutes, is electric buses. I have talked about this several times before. Electric buses provide a huge opportunity. This state has moved slowly in this direction. We currently have one. I understand we will have four on trial by later this year, but at the same time the government has indicated we might order 900 diesel buses. We have to flip that, get on to ordering 900 electric buses and get them out there. We are seeing this happen all over the country. For example, Brisbane just got 60 new electric buses for its metropolitan network. Sydney has committed to replace all its buses—I think it has 8 000 in its fleet—with electric buses by 2030. It is not bothering with a trial, because it knows it works. That applies to cities from Madrid, to Mexico City, to Athens and beyond. This would save the state money. We currently spend \$40 million running 1 100 diesel buses and 500 gas buses. We could save that money by investing in the right technology, which, in this case, is electric buses.

The second idea is electric cars. I have talked about this a lot as well. Electric cars will play a key part in reducing emissions, especially for a car dependent city like Perth. We will need to transition our fleet as quickly as possible. WA is now the only jurisdiction in the country that is not offering any incentives for electric vehicles. There are a range of things we could do. Let me just pick the lowest hanging fruit possible, which is equalising stamp duty. Take a Hyundai Kona. If a person buys a petrol one, they will pay \$1 786 stamp duty. If they buy exactly the same car, with an electric drive train, they will pay \$4 420 stamp duty, because that car costs more up-front. The penalty for someone buying an identical car, a Hyundai Kona, is \$2 634 stamp duty, because they chose to do the right thing and start to transition. That has to be the lowest hanging fruit that this state could take right now. Of course I think we should go further. Most other states are offering incentives, around about \$3 000 incentives for the uptake of electric vehicles. It is proven globally as the best way to get that going. The Australian Capital Territory has gone further. In fact, the national Greens made a policy based on the ACT's incentives, because it was offering very low interest loans; it is about closing that gap. It has been pretty well documented now that owning an electric car is cheaper over the lifetime of that car than owning a petrol car. The problem is getting over the hurdle of that up-front cost. The role of the state is to help people get over that hurdle and make that transition quickly. I think we buy about 100 000 new cars a year here in Western Australia. Let us get on and help people buy an electric one. It is a huge opportunity.

The third idea is e-bikes; it is not all about cars. I am a big fan of bikes. Electric mobility generally is an absolute game changer. Most trips we do are actually pretty short, fewer than five kilometres, and electric mobility and bikes are a good way of doing that. We should incentivise that and help people get over that hurdle. Maybe we could reimburse people based on how many kilometres they have done on their e-bikes. It helps congestion, it helps health and it helps lower carbon emissions. We are seeing this again all over the world, with proven results.

After transport, there are some key things we can do in the energy efficiency space. LED streetlights is a really good one that the Western Australian Local Government Association has been keen on for a long time. WA has 280 000-odd street lights. Over half of these are some of the most inefficient streetlights we could imagine: mercury vapour. It is old technology that does not work particularly well. It dims over time. If we were to swap those out for LEDs, we would save around 95 000 tonnes of CO₂ a year. We would halve CO₂ emissions and see about a 50 000 tonne saving across the 113 local governments on the south west interconnected system. Local government wants to do this, but we have a perverse tariff system that discourages local governments from investing and doing this. This is when the government could step in, enable it and make it happen. A cost reflective tariff would mean a pay back of three to four years on a light that lasts 20 years. Again, it makes so much sense. Let us get on and help local governments do this for a very, very low cost to the state.

Again on our streets is the issue of urban canopy. This government started on a really good initiative that needs to be scaled up, not scaled down. That is how we grow our urban forest and get trees out there on our streets. We have

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seen a major reduction in urban canopy in our area. I think 41 per cent of councils within Perth have seen major reductions in tree canopy. We need to reverse this if we are going to keep our suburbs cool, reverse the urban heat island effect and make our suburbs more livable. In fact, a great statistic shows that if a suburb has tree-lined streets, there is a \$17 000 uplift in property prices. There is a financial win here as well. It is a really important issue and state government can partner with local government to see that happen. A really good program was running, I think the Water Corporation was doing it, that I hear will be wound back. It should be going in the other direction; we need to be winding these programs up and helping local governments get out there, cool our cities, cool our suburbs and get street trees out there. It is a huge opportunity. I would not mind some clarification. I hope that program is not getting wound back.

On to houses, which are perhaps some of the best lowest hanging fruit to address carbon emissions and save households money. Take the simple example of heat pumps for hot water. They are amazing. It is one of the most extraordinary technologies. There is some good gas water heating at the moment, with efficiencies up to around 90 per cent, but an electric heat pump is extraordinarily up to 500 per cent efficient. That is five times more efficient than using gas to heat up water. Compare running a heat pump versus using gas to heat up water; it is about half the price running off mainstream electricity. If it is running off rooftop solar, it is pretty well free. In fact, it then operates as a giant battery during the day to soak up that excess solar. I know that some in this government are worried about the duck curve, the excess solar. Get heat pumps into houses, heating up water so that when people come home at night and have their showers, it is ready to go. There are so many wins in there and the best thing is that it saves households money. We need to encourage and incentivise getting them into households. It is an extraordinary thing to do.

Saul Griffith wrote one of the best books I have read around the process of how to start to electrify everything. He called electrification a vaccine for climate change. It occurred to me, just as with COVID, WA should go hard and go early around electrification. Our households are really good places to do this. That means it is time we stop putting gas into new buildings. Why are we putting gas into new buildings? If we are serious about net zero by 2050, we will just have to take it out. In fact, we are already seeing that in Esperance. It costs \$10 000-plus per household just to take gas out. This is a liability we will have across the state if we are serious about net zero. As I said before: we cannot make gas net zero. Let us electrify all new houses from now on. I think this is a huge win.

The City of Fremantle recently mandated no new gas in developments that use its sustainability density bonus. That is a really smart policy. Victoria is looking at this across the whole state, as is the ACT. It is happening around the world, from the Dutch government to New York. In fact, even our leading local developers, Hesperia, Yolk and even DevelopmentWA, the government's development agency, are doing no new gas. We need to mainstream this, scale it up and make it the new normal. This is a huge opportunity.

That leads me to the last point I want to talk about, which is about transitioning all our housing to net zero. The national construction code is under review. WA is part of that. It will go from six stars to seven stars. There is a huge opportunity to make sure WA is not the laggard on this. We have always been the state that wants to defer implementing this, and I hope we will not be doing that this time, because it comes in this year. When it comes in in September this year, we should grab it and grab those seven stars to push harder on the way to net zero. For every year we delay, WALGA has demonstrated it will lead to 84 000 tonnes of greenhouse gas emissions and cost residents an extra \$934 in energy bills for those new home owners who are not doing it. Again, let us get to net zero as quickly as we can. We build 20 000 homes a year. We want to make sure that they are net zero ready for 2050. The costs are minimal; the savings last a lifetime. This is the kind of action we should be doing.

The last point I want to talk about is housing retrofits because, of course, new homes are only a small part of the market. We need to start retrofitting old houses and retrofitting public housing stock is a really important way of doing this. I note that the Department of Communities is currently undertaking its Building Condition Assessment program of ageing public housing. I am told—this is a concern—that it is not doing energy assessments as part of that program, which is a wasted opportunity to draft-proof those houses and make them livable and lower the cost of energy for the people who live in those houses. It has been estimated that doing this would reduce household energy consumption by up to 80 per cent and save 277 000 tonnes a year, which is extraordinary. Importantly, that would save those income householders up to \$1 600 a year in their energy bills. This is a win-win if the government can get in front of it.

I have talked a lot about households because they are biggest chunk of our domestic emissions; indeed, 42 per cent of domestic emissions is linked to households. There are huge wins to be gained by saving households money and in how we do it. We have a really important role to play in terms of how we do this. As Saul Griffith said, we need to do the work now so that by 2025, the average Australian family can electrify its household with ease. This is a role for government to see the future and invest in it and it will be an investment because every one of the things that I have mentioned will result in lower emissions. The ideas that I have talked about are great ideas, but I cannot

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take credit for them. I want to thank the expert panel that assisted me and many of the key organisations, such as the Western Australian Local Government Association, Shelter WA, Clean State and others, which fed in their ideas. These are smart ideas from experts that we need to action today.

In closing, climate change is not a political problem that can be fixed with announcements, reports, studies or trials; it is simply a problem of physics. That problem can only be addressed by not burning fossil fuels in cars, houses and industry. Ultimately, we must leave fossil fuels in the ground—yes, this includes gas—and turn off our fossil fuel machines early. Leaving our fossil fuel machines on—I am talking about just the ones we currently have without buying or investing in new ones—results in 1.8 degrees of warming. The Intergovernmental Panel on Climate Change report is very clear that we need to get as close to 1.5 degrees as we can because every tenth of a degree above 1.5 has serious consequences for the planet, especially places like WA. We need to make sure that we get as close to 1.5 degrees as we can and that means that we very clearly need to act on these ideas now, not in two years' time when the sectoral emissions reduction strategies are finally done and released, and not in the vague future on our way to net zero, which we are scrambling to reach by 2050. We need to do it at ambition and at scale now in line with the IPCC report and what scientists are calling for. Anything less than that is a lost opportunity and we will not be doing our job.

I want to finish with a quote from Western Australian IPCC author Professor Peter Newman, who has done, along with many others, extraordinary work; indeed, he authored the “Transport” chapter in the last IPCC report. He said —

“We now have a cost effective set of solutions that can provide dramatic reductions. An exponential decline in fossil fuels is now on the cards because they are market ready, they are cost effective ...

We can make the changes now, working with the economy, and not against it. That's a dramatic shift in what we are seeing in this IPCC report.”

This is a pivotal moment in history and one in which WA has an extraordinarily huge role to play. I hope we can grab this opportunity, this moment, and make it happen.

HON DR BRIAN WALKER (East Metropolitan) [10.34 am]: Thank you, Hon Dr Brad Pettitt. It gives me great pleasure to rise in support of this admirable motion. Hon Dr Brad Pettitt and I are not only fellow crossbenchers; we are committed in our bones to a better environment for not only our city—we both live in Fremantle—but also our state and nation and, indeed, the world. As a world, we are standing on the tracks of a train line and we can see the train approaching—it is getting closer and closer. We are standing on the lines wondering whether the train could be any lighter or whether it could take a side track to avoid us. We are on that line, the train is coming and action is required—now. The idea of net zero by 2050—no! I think 2030 is appropriate, perhaps even 2025 would be ideal because we do not have a day to waste. We are seeking solutions, not making a problem, but complaining that the train is coming closer and closer. No—let us find solutions. I agree with every word that has been said in this motion; there are other things that we can do, other solutions.

It will be of no surprise to members at all to hear that I am going to speak about hemp as a solution, because the second limb of the motion calls for action and we have a remedial suite of actions that we can put in place. Hon Dr Brad Pettitt mentioned a number of wonderful solutions to not only reduce carbon emissions, but also embrace carbon capture. What we are looking for is restorative action—something that will bring our world back into some measure of equilibrium, the way it was created in the first place. To do this, Hon Dr Brad Pettitt mentioned housing—I was very pleased to hear this—and reducing costs. Are members aware that in a house built from hemp—there are a number of excellent examples, of which the Department of Primary Industries and Regional Development is very well aware—the cost of air conditioning is almost zero and the cost of heating is almost zero because insulation is a given, as is soundproofing. It is an excellent medium of which we are making little use. We would save an enormous amount of energy if we simply adopted a new approach to building houses rather than building them the old-fashioned way, which we have been doing for 100 or 200 years. We can also look at trees—this idea just came to me; I did not prepare it—and ask why we are not planting more trees in our suburbs. Why do we not plant fruit trees so that the homeless and hungry can access fruit? What about verge-side gardens where food is grown for the homeless; would this be of benefit to us? It certainly would, and I think we would all approve of that.

I had a wonderful discussion about carbon capture with the Forest Products Commission—we are yet to debate this issue—and its knowledge on carbon capture is immense. We ought to continue this, and we will continue this. Cambridge University research shows that industrial hemp can capture atmospheric carbon dioxide two times more effectively than forests. We can look at hemp as being an ideal carbon sink. One hectare of hemp will absorb 22 tonnes of CO₂ while two crops of hemp per year would double that. One tonne of harvested hemp contains 0.445 tonnes of carbon from the atmosphere; these are United Kingdom statistics. Hemp needs lower fertiliser quantities and zero pesticide and herbicide. Of course, research is needed and research is ongoing. I am very thankful to the organisations within WA that are conducting this research. We can look at putting this into practice. Water requirements are reduced with the use of hemp. Hemp also helps with diverse soil types and improves soil quality.

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When the roots bind the soil, there is less erosion. Anyone who has been in the wheatbelt during a dust storm will have seen the topsoil blowing off into the west and heading out to sea. We need to do something about this because the nutrients and crop yields are going down. No-one can dispute that we do, in fact, have climate change; we can discuss the cause, but the problem is that we have climate change so what are we doing about it? The answer is that at the moment, we are wringing our hands in self-pity and not doing as much as we could or indeed as fast as we could.

One other aspect of hemp is that it can be used to remediate toxins from the soil. It is a hyper-accumulator because it soaks up large amounts of toxins. It has a fast-growth cycle and fast biomass with a high tolerance for heavy metals. Is this worthy of intensive research? Yes. Is research being done? Yes, it is, but we need it to happen faster because time is of a premium. Hemp was used in Russia to clean up radioactivity in the soil around Chernobyl. It has been used in Germany for managing heavy metal toxins and in Poland to fight or remediate copper in the soil. In New South Wales, it is being trialled to rehabilitate soil damaged by sewage. It helps to reverse acid changes in soil; it remediates the soil caused by acid rain. I believe that DPIRD is surely investigating this; I encourage it to do so. I give thanks to the experts we have here. I ask for more speed because we can reduce our pollution, conserve our water and improve our soil. I see no downside to that.

I have a number of papers here. One is from Poland. This Polish paper is by Jerzy Mańkowski and Jacek Kolodziej. My Russian is better! This paper was very interesting because of the possibility for phytoremediation, which brings me to the question: could we invest in a trial of hemp to remediate the soil in Wittenoom? I do not know. No-one knows. It is certainly something that we ought to be looking at. The University of Pennsylvania produced a paper that looks at revitalising the soil. I can only quote the source of that paper; I am obtaining it and I will present it. Again, that would be an intriguing thing for Wittenoom. The third paper here is by Placido and Lee. They are from the US Department of Agriculture's Agricultural Research Services in Albany, California. The paper looks at hemp as being a superior soil remediator. Those researchers are looking at genomic sequencing and bioengineering hemp to improve its already impressive capabilities for phytoremediation. We have in my office a repository of science research that I am very happy to share with members. At this moment, for the interest of members, I have two papers here, the one by Jerzy Mańkowski and the one by Dante Placido and Charles Lee, and I seek leave to table these papers.

[Leave granted. See paper [1218](#).]

Hon Dr BRIAN WALKER: This second paper from Placido and Lee goes a long way to pointing out the attractiveness of hemp as a substitute for a traditional form of soil remediation, which is costly and potentially damaging to land. This could remediate that soil much more efficiently. I would recommend that we do that. If we were to do that, we could look at Collie. I have personal experience with the regenerating of the mine site at Collie, which I believe is already being investigated. I would encourage people to go further into this—to restore the land to a sufficient quality to allow it to be given back to the Indigenous owners in a pristine condition. This is one of our obligations. It is the right thing to do and we can do this. It would help in so many ways. I do not have the time to talk about that, but there are so many ways to enhance Western Australia and Indigenous wellness.

Yesterday, I was talking with members from the Fitzroy water catchment area, who are active in encouraging us to think differently about water. We have a crop here that will require low irrigation, can be a financial bonanza for its owners and will result in carbon capture. Can we imagine what would happen in an area where, at the moment, cattle run riot? We all like to eat beef, unless we are vegan, but it causes damage to the land and takes an enormous amount of water to grow the fodder for the cattle. Even if we are not vegetarian, we know that the ecological cost of providing the fodder to feed the animals that we then eat is not economically or environmentally sustainable. We ought to think about this differently.

We have our obligations here under the Paris Agreement. I believe that we must have hemp to reach those goals. I put it to members that the scientific case is clear, and I suggest to my colleagues here that this would be a very important thing to do. We call on the government to redouble its already laudable efforts in investigating hemp as an industrial crop. We stress that it would not only help the environment, but also greatly increase the state's finances. As I said in my budget reply speech last year, it could provide a balance to our iron ore exports, which would greatly stabilise the security of Western Australia.

Members, there is no downside to this, there is only upside, and we need to grasp the opportunity now. I give thanks for this motion, to which I give my full support. Thanks for introducing it.

HON TJORN SIBMA (North Metropolitan) [10.43 am]: I think that this is an astoundingly comprehensive and ambitious motion. One might disagree with some of the assertions provided by both previous speakers, but I think what has been illustrated here is that the issue on which we are being asked to focus our minds is a comprehensive and intricate one—one that I think demands a degree of humility around the forces we are being enjoined to battle against and the urgency with which we are being asked to act.

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Putting the challenge of human-induced climate change into its proper perspective is a difficult one. I am about to turn 45, but I remember that as a young person growing up, the greatest existential threat was one of mutually assured nuclear destruction. That was probably in the last decade of the Cold War. Nevertheless, I had a very—I use this term advisedly—bolshie year 4 teacher named Mrs Dodd, who I think almost on a daily basis instilled great fear among the cohort of about 31 or 32 students that the world was going to end. I did not think that was particularly pleasant, nor did I think it was particularly plausible. I did not have the—I will not necessarily say sophisticated—more developed framework to consider the arguments then that I do now. But it has minded me to accept challenges when they arise but attempt to put them into some proper perspective, which is not to diminish them and not to explain them away, because when we talk about issues of climate change, we inadvertently sometimes run two things together. I will disagree with Hon Dr Brian Walker about one aspect, although I do not think it was intended: there has never been a homeostasis. There has never been a climate equilibrium. There has never been. We are dealing with a dynamic set of forces. We are only now attempting to understand what those natural forces are, what they mean, what their dynamics are and what the interplay is between those pre-existing forces and human-induced climate change.

I like debates like this because we step out of the rancour of Thursday morning, which is sometimes good for us. It is often good to be rancorous, but it is also very good to step back and keep a sense of proportion.

I came across a study from about a year ago in preparation for today, although I am not as prepared as I would like to be. I thought I would read it in. I think it is quite informative, and it is germane to the south west of Western Australia and its climate record. It is a paper published in a journal called “Climate Dynamics” in 2021, and it is called *Megadroughts and pluvials in southwest Australia: 1350–2017 CE*. I quote from the abstract —

Declining winter rainfall coupled with recent prolonged drought poses significant risks to water resources and agriculture across southern Australia. While rainfall declines over recent decades are largely consistent with modelled climate change scenarios, particularly for southwest Australia, the significance of these declines is yet to be assessed within the context of long-term hydroclimatic variability. Here, we present a new 668-year ... tree-ring reconstruction of autumn–winter rainfall over inland southwest Australia. This record reveals that a recent decline in rainfall over inland southwest Australia (since 2000 CE) is not unusual in terms of either magnitude or duration relative to rainfall variability over the last seven centuries. Drought periods of greater magnitude and duration than those in the instrumental record occurred prior to 1900 CE, including two ‘megadroughts’ of >30 years duration in the eighteenth and nineteenth centuries. By contrast, the wettest ... decadal periods of the last seven centuries occurred after 1900 CE, making the twentieth century the wettest of the last seven centuries.

Hon Alannah MacTiernan: Who’s your source there?

Hon TJORN SIBMA: I will seek leave to table it, because it is actually of use. It is published by two academics from the University of Western Australia as well as the Department of Biodiversity, Conservation and Attractions.

Hon Alannah MacTiernan: What are their names?

Hon TJORN SIBMA: O’Donnell, McCaw, Cook and Grierson.

[Leave granted. See paper [1219](#).]

Hon TJORN SIBMA: I think that is useful, because if we are going to talk about adaptation, we have to understand the parameter bounds. To do credit to the argument that was posed, I think the injunction here is to observe the precautionary principle that something anomalous is happening in addition to existing known climate dynamics that would seize the mind.

The issue then, of course, which I think was well put, is one of adaptation. Adaptation also infers a degree of disruption, including economic disruption, which I think is completely unavoidable, but Hon Dr Brad Pettitt put the argument that the economic cost of disruption is worth the benefit. In the main, I would probably concur with that, but I do not think that any means is as advantageous as any other means. We need to bear in mind the fact that uniformly across Western Australia and the Western Australian polity there is an understanding that climate change is real and that there is a personal and community desire to do something about it, but there are vast differences of opinion on how best to prosecute that and, frankly, there are great disparities in individual capacity to pay for that remediation.

My line of caution is that I am encouraged by the need to act swiftly, but I will not countenance, for example, the closure of the oil and gas industry in Western Australia. That is a red line I will absolutely not cross—ever. In fact, it is that abundance of energy and minerals that has created Western Australia as a viable socio-economic entity, and without it, there would be no community. Although I am not making the case necessarily for the glory of fossil fuels, we cannot but help observe the foundational quality of fossil fuels in human development because it is the only alternative that people, particularly in developing countries, have to make the social and economic

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advances that we take for granted in a community like Western Australia. Therefore, there needs to be a sense of proportion here.

The challenge posed by a motion like this, honourable member, is something on which we could spend weeks in a civilised and rational way. Although we do not have that opportunity very often, President, try as we might in this chamber, and certainly not on a Thursday morning, this is probably the exception that proves the rule.

I am interested, though, in paragraph (a) of the motion. I look forward genuinely to the response of the minister representing the Minister for Environment on this. I am keen to understand exactly how the sectorial emissions strategies being put together by the government will work and—I assume this is the case and I am here to ask the question—whether that logic and discipline will be applied to the government itself. I recall that in question time yesterday, Hon Dr Brad Pettitt asked for a point estimate of the government's carbon footprint as of yesterday. I asked a similar question last year and there was no answer to it. It would be good to understand what that is because if we are going to start to apply discipline to other sectors, the government should lead by example, and it would be easier for some parts of government to deliver on that than others, particularly when the Water Corporation intends to build a \$1 billion desalination plant in the northern suburbs, which is necessary but which will be exceptionally energy intensive. The capacity to run that on renewables is completely unproven so I look forward with interest to the minister providing the government's reply.

HON ALANNAH MacTIERNAN (South West — Minister for Regional Development) [10.54 pm]: I very genuinely commend Hon Dr Brad Pettitt for bringing this important motion to the house. He plays an important role in this house by continuing to ensure that these incredibly important issues are front and centre. He rightly has drawn our attention to the recent Intergovernmental Panel on Climate Change report. I assure the member that Minister Whitby and, indeed, all members of the ministerial task force on climate change are well aware of this report and absolutely understand the need to press forward on this matter.

I have to say that a lot of work is underway at the moment. The McGowan government recognises that it is not acceptable to have a target for just 2050, so it is working on establishing a realistic target for 2030. We note that the very unambitious target of the Morrison government is something between 28 to 30 per cent on 2005 emissions and we note with great enthusiasm that the likely people to replace the Morrison government, the federal Labor Party team, have committed to a 43 per cent target by 2030. We believe that it will be so much easier for us to work constructively and to be more ambitious if we have a change of federal government. I believe that very sincerely. Having a government of which half of its representatives do not believe in the whole issue of climate change challenges its engagement on climate projects. For example, the federal Minister for Industry, Energy and Emissions Reduction, Angus Taylor, and I have had some heavy conversations about the proposed Pilbara hydrogen hub. He wants the work of that hub to be diverted to look at opportunities for carbon capture and storage in blue hydrogen. We have made it very clear that although work has been done quite separately through the LNG task force on carbon capture and storage, we believe that when we talk about hydrogen, the government investment and focus has to be on renewable hydrogen. There are many other stories I could tell just from my experience, and the Minister for Energy and others, no doubt, have similar stories. If we are to get federal funding, all the funding that we want to put into climate change factors in building climate resilience must be seen through the lens of drought rather than through climate change resilience. Therefore, I think that we will be able to work more consistently and achieve much more with an aligned federal government.

As the member acknowledged, we are doing the sectorial emissions because we want a target that is ambitious, but with the real prospect to drive that. Minister Whitby is looking at not only targets but also reporting. Over the next six months, I think a number of issues that the member spoke about will be further addressed by our government. The member mentioned a lot of detailed mitigation measures, and most of them are worthy, but I think it is important—this did not necessarily seem to factor in the argument that the member put—to recognise the work this government is doing to transition out of coal. That will be a significant change as we replace coal with renewable energy projects.

I note that the member was talking about electrification. I was a bit surprised that he did not focus on discussing hydrogen and the role that it can play in transport. We currently have \$10 million on the table for expressions of interest for a hydrogen-fuelled transport program. We are looking at heavy haulage commercial vehicles because we think that hydrogen will potentially be more efficient in those vehicles than electricity as some very significant batteries would need to be carried, particularly for long distance travel. I urge the member to look more at the prospect of hydrogen. I know that he is a great fan of electrification. Some extraordinarily interesting work is being done on how hydrogen can replace natural gas. Things are changing but at the moment, for example, certain manufacturing processes cannot be accommodated with electricity. If the member is looking at manufacturing processes requiring energy in excess of 1 500 degrees Celsius, a thermal process is needed. Obviously, the government sees hydrogen as an important part of the process to ensure that even those processes can be turned into a used renewably generated product.

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I would love to talk for a long time about the prospects of hydrogen but it is also important to understand that we are making progress on this front. Unfortunately, I do not have the data but we are working hard to accommodate this growth of renewable energy. Our investment in the big battery in Kwinana is important in making that transition to renewable energy. I note that just last week we announced a partnership with Sunshot Industries, the company led by Ross Garnaut. We are jointly investing \$1 million to investigate the development of a second large battery, this time down in Collie. Associated with that is the potential for a plant to develop renewable urea, so that the ammonia component of urea products can be generated from renewable hydrogen. This stuff is not all pie in the sky. I know that the member for Fremantle has a view about the Woodside H2 project in Kwinana. As I have said to him, the most interesting stage of that project is Woodside's commitment to a 250-megawatt electrolyser that will take renewable energy off the grid and generate renewable hydrogen that can feed into our transport aspirations.

When I was a mayor, I was personally involved with the move towards LED street lighting. Urban canopy is certainly a great interest of mine and Minister Whitby. We have a native vegetation policy. We will certainly be doing more work on this. I am investigating heat pumps for my own use in Albany. It is quite amazing technology, particularly those that capture energy from the air. A real education process can occur in Western Australia.

I say to Hon Dr Brian Walker that I have strongly supported the hemp industry by making legislative changes. I have invested in research and used regional economic development grants to fund two processing plants—one in Bridgetown and one in Margaret River. I say to the member that hemp is not a miracle crop but it certainly has value. The member does not want to sound like one of those potheads who are taking the industry backwards by sounding completely unrealistic. It is great that cannabis can be supplied by way of a plant, and it has a lot more potential. But it is not a miracle plant; it will not give us world peace, nuclear disarmament and all of that. It is a crop that takes a lot of nitrogen out of the soil. There seems to be the view that it is a nitrogen fixer. We do not have evidence of that. It is a positive plant. It has a contribution to make. I urge the member to be a little more measured during his presentations. We believe that cannabis crops can be used for fibres and in building materials. I have been into those hemp homes but it is not a miracle solution. As I think we all know, there will never be one single solution.

I was interested in the comments of Hon Tjorn Sibma, someone who grew up in the thrall of the possibility of nuclear war. I think Hon Tjorn Sibma's point was that it has not happened, so there was a lot of exaggeration. I suspect that over the last couple of months he might have been a bit premature in suggesting that is not a real and present danger to our community. I would not use that as an example to suggest that the sense of the need for climate action and the talk about a climate emergency is not real.

I probably part company from Hon Dr Brad Pettitt when I say that we need more ambition. We have to drive hard. These issues involve making that transformation. Although at one level we can say, for example, that we have battery technology and we know how to make renewable hydrogen, to do it on a large scale to see change in our manufacturing capability in the world, we would need to increase production by such a large quantum. Even with all the projects occurring in Western Australia over the next 10 years, our manufacturing capacity to build electrolysers to service Western Australia does not exist in the entire world. Similarly, with battery production using critical minerals; we need to scale up but we have to be realistic about the transition time that that is going to take. That is why we have that difference of view. I think we can get there, unlike Hon Tjorn Sibma. I think we can have a gas industry that might not use fossil fuels. But we are not ready now. We will not be ready in 2025. It will probably be more like 2040 to 2045 before we can actually scale this up. I agree that it is important and our government agrees that it is important that we start that process, and we start it with a great deal of ambition and drive.

HON WILSON TUCKER (Mining and Pastoral) [11.08 am]: I rise to support this excellent motion. I thank Hon Dr Brad Pettitt for raising it today. I have not spoken often on the issue of climate change but it is a topic that I am passionate about. It is sometimes quite difficult to outgreen the Greens on the issue of climate change. In my inaugural speech, I was going to talk about climate change and quote the words of former Prime Minister Kevin Rudd that climate change is the greatest moral challenge facing our generation. I addressed a lot of other issues in my inaugural speech and decided to cut it a little short. It is an issue that I care about.

I was certainly compelled to speak today on my views on climate change and in support of the crossbench, but also the fact that it is quite pertinent that the Intergovernmental Panel on Climate Change's sixth assessment and third working group report has just come out. It has coincided quite nicely with the honourable member's non-government business motion. I want to acknowledge the Minister for Regional Development's comments about a potential 2030 target. In the words of my mother, and I am sure other mothers around the country, I was going to say that I am not angry but just disappointed about the silence from the government on this issue and its acknowledgement of the latest assessment report. But it was good to hear the Minister for Regional Development acknowledge that the report exists. To acknowledge this report is to acknowledge what it is saying. As the honourable member said, we need action now. This is the last major report that will come out before it is too late to make any decisions to limit global warming to below 1.5 degrees compared with preindustrial levels.

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To put this report into real terms, chapter 11 talks about Australasia. In summary, it mentions that bushfires and flooding events will become more frequent. We have seen significant flooding events in Queensland and all of us in this room know that Western Australia is still susceptible to flooding and bushfires. We had some very tragic bushfires over the last summer period. We have also seen some of the highest temperatures on record during the summer period in Perth and up in the Kimberley and the Pilbara. Many temperature records were broken and for few days we had the hottest place on the planet. This report basically says that those temperatures and the severity and frequency of the significant weather events will continue into the future. The report also mentions the potential for crops to be impacted, certainly in the Esperance area and the south west. By 2050, crop yield in those areas will potentially reduce by 30 per cent, which should fill the agricultural members here with dread. Until today, the silence from this government has been heard federally as well. There has not been much acknowledgement —

Hon Alannah MacTiernan interjected.

Hon WILSON TUCKER: To clarify, minister, up until this point there has been silence from this government.

Hon Alannah MacTiernan interjected.

Hon WILSON TUCKER: I have not heard anything, member.

Hon Alannah MacTiernan interjected.

Hon WILSON TUCKER: From the Labor government; no, nothing.

Hon Alannah MacTiernan interjected.

Hon WILSON TUCKER: Where? From this report, member.

Hon Alannah MacTiernan: You mean in the last week.

Hon WILSON TUCKER: In the last week, since this report came out —

Hon Alannah MacTiernan interjected.

Hon WILSON TUCKER: Since this report came out on 4 April there has been no response from this government—that is my point—or federally. I will talk about the Libs —

Hon Alannah MacTiernan: What is the date today? So that's three or four days. Our minister has been in isolation with COVID and so —

Hon WILSON TUCKER: Minister, it would take five minutes for the climate minister to tweet. All I want from him is an acknowledgement of this report and to say that we are working on a target. I know that the Premier has acknowledged a previous sixth assessment report and that he was looking at a potential target, and I know that the honourable member tried to push a private member's bill to regulate a target, but that it was knocked back. I know that the Premier has made some concessions in that area and I also acknowledge the concessions made by the regional minister as well. I was going to say that until this point, the federal Liberal government has also been silent on this. When Scott Morrison was recently on Perth radio, he was asked about the report. He acknowledged cyclone Seroja that devastated Kalbarri. He acknowledged the report and the science conducted by the Bureau of Meteorology, which basically says that we will experience more frequent severe weather events and higher temperatures. He did not go so far as to say that the frequency would be likely to increase as a result of climate change, which was a little unfortunate. We will potentially see a change of government federally and hopefully the new federal government will work more closely with the state government on this issue. There has not been much federal commentary. Some acknowledgement was given by Labor members and the Greens, as would one fully expect. To date, WA has an aspirational target. To work towards a 2030 target, or any target, would be beneficial.

The silence in WA on this issue and for us to continue with the status quo contradicts the science in this report. The silence says to me that we care about climate in WA but not at the expense of profits for resource companies. It will be a long transition, but it needs to move quickly and I encourage this government to work on a target. The minister mentioned a climate workforce. Hopefully, we can see some output from that workforce sooner rather than later. I take this opportunity to remind the government that it certainly has the money and the means, with a double majority in this place, to push this issue of climate change and to make it less political and take some decisive action.

HON NEIL THOMSON (Mining and Pastoral) [11.16 am]: I approach this debate today in the spirit of the comments made by my colleagues on both sides of the house. Hon Dr Brad Pettitt has brought forward an excellent motion, I must say, in terms of its focus on solutions. I commend the honourable member. I like the way that the motion has been structured and those last four point are very useful, informative and helpful. I understand the politics of climate change. I have been in the public service for some time, and now in this place. I recall when I was in Treasury in the 1990s and early 2000s, when the debates were underway internally within the public service about the economics of mitigation measures and policies, carbon taxes, trading schemes and what was the most efficient

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and so forth. My personal observation has seen a level of disappointment over time. It does not really matter what side of politics one has come from as prime ministers of both colours have been shipwrecked, one could say, on the altar of trying to drive some meaningful policies on climate change. That is my personal view. I do not think that the Greens are particularly blameless in this space in terms of some of the federal movements when certain incremental changes could have been achieved. I understand, again, that the politics of it has meant that it is game that has been played politically in Australia for at least 20 years where we have —

Hon Alannah MacTiernan: This is quite amazing that you're raising this because I deliberately didn't raise this out of deference to Hon Dr Brad Pettitt, but I'd have to agree with you.

Hon NEIL THOMSON: Thank you, minister. As I said, I will approach this debate today in the spirit in which the motion has been put because when things could have been locked in we did not do that and Australia has been the worse for it. But in saying that, I think one of the big changes that has occurred in recent times—I also commend Hon Alannah MacTiernan for her interest in and for driving the hydrogen space—is the massive change in technology. We are now seeing a real opportunity in Australia to reduce carbon emissions much more rapidly over time simply because of the investment in technology that has been occurring over the last 20 years. Rather than an artifice by some economist working out how to create a market for carbon and driving additional costs to the consumers and industry and so forth to provide an incentive to change, technology is now enabling change simply because it will be cheaper to achieve a carbon-free economy in the future. I think that is very exciting and encouraging.

I was also very excited and encouraged when I was in Leinster for the official opening of a new project at the Agnew mine that was supported by the federal government. It is easy to pile on the federal government, and people like to do that, but the fact is that the Australian Renewable Energy Agency supported that tremendous project because it provides a technological opportunity to deliver 50 megawatts of mainly renewable energy into a sector that is probably quite difficult to break into. That brings me to the point about Western Australia being seen as the only jurisdiction in which carbon emissions have increased. I understand why and that our reliance on our resources sector has created that problem. In reference to the third parties, I assume that Gareth Parker is not politically motivated. On 17 November, he wrote in *WAtoday* —

Given the opprobrium that has been heaped on the Morrison government's record on and commitment to cutting carbon emissions both in the lead up to and aftermath of COP26 in Glasgow, it is noteworthy that criticism of the West Australian government has been comparatively mute.

They are not my words but the words of Gareth Parker.

Hon Alannah MacTiernan: Okay, so that was five years ago.

Hon NEIL THOMSON: No, this was on 17 November 2021, only a few months back. We can see the record and we can see that Western Australia is lagging behind. That is why I am here to commend the calls for this government to look at building a greater adaptive capacity and to accelerate the inclusion of adaptive planning, for example.

We can come in here and rage about other aspects of Australia and not take responsibility for the things that we can do here in this place, but I wrote an article in January presenting information on the issue of apartments not having charging stations for electric vehicles. That is a growing problem, particularly in older apartments. I will provide some advice to the government. I am always happy to provide advice. There is an opportunity for the Department of Jobs, Tourism, Science and Innovation to provide better information to strata bodies. I did some searching online and found that at the local level there are things we can do to improve and accelerate this. We can talk about the grand visions for hydrogen, and we know they are important, but let us not forget to focus on the things that the state is responsible for, particularly in the planning space, which is my shadow portfolio. We know there are real opportunities. The retrofitting of charging stations is going to be a big issue. Sometimes strata bodies include apartment owners who may not necessarily have expertise in the types of business decisions that need to be made on those types of investments. As part of a review into the planning sector, I encourage looking at how to provide better information. When we compare Western Australia with New South Wales, we can see that there is no comparison because New South Wales is providing better information to its strata bodies. That is my piece of advice to members opposite. There are things that we can do. Rather than grandstanding, get down to brass tacks.

I commend Hon Dr Brad Pettitt for his comments about gas in new homes. To be honest, I had not thought too hard about that issue but I think he made a worthy comment about how to deal with that issue going forward, because we do not want to have stranded assets. I think the Minister for Planning should ask the Western Australian Planning Commission to review the residential design codes and look at how we can embed some of these new technologies in the future. It is not just in planning; there are also real opportunities in transport. We can do a lot of things to achieve the outcomes we want to achieve. I certainly commend the motion today because we do not want to get into the argy-bargy, although we do expect some argy-bargy to continue.

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HON DR BRAD PETTITT (South Metropolitan) [11.26 am] — in reply: I thank each member for their contribution. It has been a very constructive and civil conversation on an issue that, as Hon Neil Thomson indicated, has historically been quite partisan. I hope the takeaway from today is that this issue does not need to be partisan. We can all agree that there are solutions, and the Intergovernmental Panel on Climate Change report is at the heart of it. We have the solutions and can implement them now, but we need to scale up. I want to respond to a comment the Minister for Hydrogen Industry made about the issue of scale. Now is the time to scale up in a lot of areas. We are seeing extremely good work in the hydrogen space. I did not mention hydrogen, partly because I know that in many ways this government is onto it, and I congratulate it for that work. But all the evidence—again, there is some good work in the IPCC report—indicates that hydrogen is probably 20 per cent of the solution.

I know that the minister thinks I go on about electrification, but all the evidence I have seen is that electrification is the other 80 per cent in terms of getting fossil fuel use down. Electrification will be at the heart of it, but that is not what we are scaling up. It is time for the minister to change her job title to “Minister for Hydrogen and Electrification” and to be given more work in that space, because that is where a lot of the quick wins are. At the heart of this motion, the IPCC report and the examples I have given today are the quick wins. Hydrogen is not a quick win; it is for those areas that are hard to electrify. We would use hydrogen only for those things that we cannot electrify because it will never be as cheap or as efficient. I was pleased that there was a sense of agreement. I think that the science is very important and I do not feel—I know—that the science is extremely clear on what we need to do.

I remind members of the IPCC report, the earlier report and the work that has flowed since on the importance of an increase in the global temperature of between 1.5 degrees and two degrees. To give members an example, if the temperature kept warming as close as it could to 1.5 degrees, we would see a decline of about 70 per cent of our coral reefs. If we let it increase by two degrees, 99 per cent of our coral reefs will decline. In terms of extreme heat days, if we keep the global temperature to 1.5 degrees, 14 per cent of the global population will be exposed to severe heat. At two degrees that becomes 37 per cent, which is 2.5 times worse. That half a degree is important. That half a degree is at the heart of the action that needs to happen this decade, and is why we need to go hard and go early. I have a sense that there is agreement that we need to do this. What I think there is no agreement on—therefore, there will be no action—is that we need to go much harder right now. I am not saying that; the IPCC is saying that. This is about scaling up immediately. The IPCC uses the word “accelerating” again and again. I hope we can accelerate in all the quick wins, be it, as Hon Dr Brian Walker talked about, in the space of hemp.

Another member’s point was that poorer countries need fossil fuels—sometimes they do. However, there is technology to leapfrog fossil fuels. We are at an amazing point, but we have to let our own communities invest in the right solutions that leapfrog fossil fuels. In many ways, the heart of this motion is that there is so much opportunity to do things differently and quickly. There is growing consensus globally, but we are missing the urgency and the funding to do it. In the budget that will come down in a month from now, I hope that we will see some major new funding to scale up and get us moving. If we do not see that, I offer one of my favourite quotes: it is not in the policies or aspirations that we see what a government stands for; it is in its budget. In this budget, we have to see real action and real commitment to scaling up low carbon solutions that we can do now and over the next couple of years. It is not about plans. It is not about vague targets. It is about budget projects right now.

I want to end by thanking the people who helped me write this motion. There was a second motion on adaptation that we did not get to, and I will leave it for another day. Of course, adaptation is an important pair to mitigation. We have to bring down emissions, but, regardless of that, there will be some adaptation to climate change that is already happening that we need to address. I want to thank the working group and expert panel that I had. It included multiple IPCC authors and many other experts from universities and industry, and I would like to acknowledge them in closing. That included Professor Bill Hare, Professor Peter Newman, Professor Petra Tschakert, Dr Martin Anda, Dr Hugh Finn, Dr Brad Hiller, Larissa Taylor, Tamara Smith, Chantal Caruso, Johanna Mitchell—all wonderfully facilitated by Meri Fatin—and my staff as well who worked really hard on this. We considered a lot of really great work that was done by the sector. I talked about examples from Shelter WA and the Western Australian Local Government Association. Even the Greens climate crisis working group did some really good work in this space. I have to acknowledge Clean State and the jobs report that it did a few years ago. It continues to do good work in this space.

In this chamber, I try to talk about evidence-based issues and issues based on best expert advice, and not just put up political partisan positions. I am always pleased that the Greens’ position on climate science is very much one that is aligned with the evidence, and, in this case, we worked very hard with these experts to ensure that we had the best possible motion before the house. With that, it was pleasing to hear such positive feedback and positive contributions from you all. Thank you, and I hope this leads to renewed energy and focus on, and less silence in, the climate space.

Motion lapsed, pursuant to standing orders.