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Climate Change in Western Australia

Issues Paper – September 2019

Submission to the Department of Water and Environmental Regulation

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About CME

The Chamber of Minerals and Energy of Western Australia (CME) is the peak resources sector representative body in Western Australia. CME is funded by member companies responsible for more than 90 per cent of the State's mineral and energy production and workforce employment.

In 2018-19, the Western Australia's mineral and petroleum industry reported a record sales value of $145 billion.[1] Iron ore is currently the State's most valuable commodity at $78 billion. Petroleum products (including crude oil, condensate, liquefied natural gas, liquefied petroleum gas and natural gas) followed at $38 billion, with gold third at $12 billion.

The value of royalties received from the sector totalled $6.5 billion in 2018-19, accounting for 20 per cent of Government revenue.[2] [3] [4] [5] In addition, contributing to 40 per cent of the State's total industry Gross Value Added,[6] the sector is a significant contributor to growth of the local, State and Australian economies.

Summary of recommendations

- CME recommends the WA Government remain strongly engaged through the COAG Energy Council and other relevant multi-jurisdictional processes and Commonwealth Schemes to ensure distortions do not emerge that disadvantage WA and to ensure that WA receives reasonable access to Commonwealth support for its electricity transformation.
- CME supports a national framework for emissions reductions which promotes lowest cost abatement and views any consideration of trade-exposed sectors as best addressed through a national market-based scheme – particularly noting the Commonwealth Government's primary responsibilities for international trade.
- The WA Government, with the Commonwealth Government and in coordination with the COAG Energy Council, should continue to support and enable the development of the hydrogen industry in WA.
- The WA Government and its regulatory processes should carefully consider both the incentives and disincentives it creates for industry innovation and entrepreneurial activities.
- CME encourages the WA Government to continue to commit to the South West Hub Project.
- WA Government to finalise its policy work to provide certainty on issues affecting carbon rights and eligible interest holder consent for human-induced regeneration (HIR) projects in a manner that appropriately balances and fosters multi-land use considerations.
- CME also encourages the WA Government to work collaboratively with the Commonwealth Government to further enhance other opportunities to deepen the WA offsets market.
- CME supports initiatives that will lead to a deepening of the available offsets market as part of ensuring sufficient access to low cost abatement options. This include ensuring connectivity to international markets.
- CME supports resolution of an international trading framework under Article 6 of the Paris Agreement.
- CME recommends the WA Government commence consultation regarding water legislation reform and prioritise the modernisation of WA's legislative framework.

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[1] Government of Western Australia, *Latest statistics release: Mineral sector highlights*, Department of Mines, Industry Regulation and Safety, September 2019: http://dmp.wa.gov.au/About-Us-Careers/Latest-Statistics-Release-4081.aspx

[2] Includes North West Shelf grants but excludes monetary contributions via State taxes, levies, fees and charges.

[3] Government of Western Australia, *Industry activity indicators: Royalties*, Department of Mines, Industry Regulation and Safety, September 2019: http://dmp.wa.gov.au/About-Us-Careers/Latest-Resources-Investment-4083.aspx

[4] Government of Western Australia, *Budget paper no. 3: 2019-20 Economic and fiscal outlook*, Western Australian State Budget 2019-20, Department of Treasury, May 2019, p. 68.

[5] Government refers to the Government of Western Australia unless otherwise indicated.

[6] Duncan, A. and Kiely, D., *BCEC Briefing note: WA Economic update*, Bankwest Curtin Economics Centre, November 2019, p. 4.

Context

On 4 September 2019, the Western Australian (WA) Department of Water and Environmental Regulation (DWER) on behalf of the Government of Western Australia released the "Climate Change in Western Australia: Issues Paper – September 2019"[7] (Issues Paper) and initiated a public consultation process.

The following submission provides CME's response to the Issues Paper and is structured to correspond to the numbered themes within the Issues Paper. CME's climate change policy principles, which have guided our response are also detailed.

Reflecting the complexity of climate change as a policy issue with broad impacts across the entire economy, the Issues Paper covers multiple different themes, not all of which have a specific linkage to the WA resources sector. Consequently, not all themes in the Issues paper are directly responded to in the following submission.

CME's Policy Principles

Climate change is a uniquely global challenge requiring a globally coordinated response, including implementation of the Paris Agreement. In CME's view, a sustainable development approach to climate change requires a framework that balances the social, economic and environmental aspects associated with emissions reduction. The ultimate goal, in balancing national aspirations within a global framework, must be to fulfil aspirations in all three areas rather than viewing them as at odds with each other. In the Australian context, this will best be achieved by an approach that ensures:

- The Australian Government has primary responsibility on emissions reduction policy and regulation;
- There is a national framework that seeks the most economically efficient and effective approach to reducing net emissions;
- Adopting a whole of economy (broad-base), market-based mechanism which promotes lowest cost abatement;
- Establishment of a mature, liquid and affordable offsets market that includes international trading for certified / credible offsets;
- A single, national reporting framework with relevant reported data publicly available;
- The international competitiveness of trade exposed industries is maintained. In particular, policies must do not distort global markets such that higher emissions intensive production outcompetes lower emissions intensive production due to climate change policies ("carbon leakage");
- To be successful, the policy framework will require State and Federal alignment, and bipartisan support; and;
- Consistent with the Paris Agreement accounting methods, national jurisdictions should be responsible for the emissions within their own borders[8].

The primacy of the Australian Government as the signatory to the Paris Agreement is key. This also recognises the Australian Government's primary role for managing fiscal matters, trade, revenue collection and infrastructure planning. A measured transition towards a lower emissions economy will require economic and structural adjustments, and long term investment that State budgets alone cannot provide. Consequently, this must be managed in a coordinated manner through the Australian Government rather than deteriorate in to sub-national schemes. The proliferation of sub-national schemes introduces inconsistency and distortion into planning and investment decisions resulting in sub-optimal and a potentially slower transition to a lower emissions economy.

A measured, coordinated approach through the Australian Government decreases the likelihood of policy shocks such as that experienced by release of the EPA's March 2019 Guidance. The Reserve Bank of

[7] https://consult.dwer.wa.gov.au/climatechange/issues-paper/user_uploads/climate-change-in-wa_2019.pdf

[8] This approach is consistent with the UNFCCC's production based emissions accounting rule whereby emissions are only counted in the country which produces them. This approach has been in place since the Framework Convention was adopted in 1992, it was restated under Kyoto Protocol in 1997 and restated again under the Paris Agreement in 2016.

Australia[9] and Professor Ross Garnaut[10], amongst others, have highlighted the hazards of policy shocks and the need for measured transition. Stable policy promotes the innovation, research and investment required to achieve a measured transition.

The State's primary focus should be to support a national framework, taking responsibility for those aspects that are the sole responsibility of the State working in lock step with the wider Australian policy framework. At all points of the policy and decision-making process, it ought to be considered whether a particular course of action best supports and strengthens Australia's framework and responses to climate change or, conversely, if it introduces a distortion that will ultimately be to the detriment of WA, Australia or the global response as a whole. For example, policies that restrict production in WA of minerals and materials critical for a lower emissions future may simply shift production to other jurisdictions, potentially in nations with lower environmental standards or more emissions intensive production processes or worse, slow the global transition to a lower emissions economy by restricting supply and increasing transition costs.

CME's policy principles for greenhouse gas emissions are broadly consistent with other industry organisations including Australian Industry Greenhouse Network (AIGN)[11], the Australian Petroleum Production & Exploration Association (APPEA)[12], the Association of Mining and Exploration Companies (AMEC), the Chamber of Commerce and Industry WA (CCI WA) and the Australian Aluminium Council (AAC)[13] – all of whom seek a national framework that is transparent, stable and predictable, establish a price signal across the whole economy and considers import and export competing industries.

The Global Response to Climate Change – The Paris Agreement

Addressing climate change and greenhouse gas emissions is a uniquely global challenge and therefore an issue most appropriately managed through global agreement by nation states co-ordinated through bodies such as the United Nations.

The Paris Agreement[14] is the global agreement that exists to bring together (the majority of) Nation States to address the global response to climate change. CME supports implementation of the Paris Agreement. This Agreement entered in to force on 4 November 2016. As of August 2019, 185 (of the 197 Parties to the Convention) had ratified the Agreement[15]. The Australian Government ratified the Paris Agreement in November 2016[16] making the Paris Agreement a cornerstone of the Australian Policy Framework.

The Agreement's central aim is "(h)olding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels"[17].

Importantly, the Paris Agreement includes a mechanism to ensure over time that each Nation State reviews and increases its ambition for lowering emissions taking in to account their national context and sustainable development goals.

> *"Each Party's successive nationally determined contribution will represent a progression beyond the Party's then current nationally determined contribution and reflect its highest possible ambition, reflecting its common but differentiated responsibilities and respective capabilities, in the light of different national circumstances."*

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[9] Deputy Governor Guy Debelle, Reserve Bank of Australia, 12 March 2019, "Climate Change and the Economy" https://www.rba.gov.au/speeches/2019/sp-dg-2019-03-12.html

[10] Available at: https://webarchive.nla.gov.au/awa/20091016011511/http://www.garnautreview.org.au/pdf/Garnaut_prelims.pdf

[11] AIGN Climate Change Policy Principles https://www.aign.net.au/documents/AIGN%20Climate%20Change%20Policy%20Principles.pdf

[12] APPEA Climate Change Policy Principles https://www.appea.com.au/wp-content/uploads/2016/02/Climate-Change-Policy-Principles-APPEA-final.pdf

[13] Available at: https://aluminium.org.au/climate-change/aac-position-on-climate-change-policy/

[14] Paris Agreement, Article 2, 1(a). Available at https://unfccc.int/sites/default/files/english_paris_agreement.pdf

[15] United Nations, Paris Agreement - Status of Ratification, viewed 9 August 2019. https://unfccc.int/process/the-paris-agreement/status-of-ratification

[16] Refer to United Nations Treaty Collection Paris Agreement https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-7-d&chapter=27&clang=_en

[17] Paris Agreement, Article 2, 1(a). Available at https://unfccc.int/sites/default/files/english_paris_agreement.pdf

Australia's current commitment to the Paris Agreement includes our Nationally Determined Contribution (NDC) of 26 to 28 per cent reduction on 2005 levels by 2030[18], which will over time progressively become more ambitious.

Regarding the transition to what is commonly known as "net zero emissions", the Paris Agreement states in Article 4:

> *"Parties aim to reach global peaking of greenhouse gas emissions as soon as possible, … so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty."*

CME supports this stated objective.

Western Australia's Context

Western Australia is an export-orientated economy with the resources sector in particular making a large economic contribution to state, and national, prosperity. Minerals and energy resources are not uniformly distributed across national boundaries, nor do they exist within these national boundaries in proportion to population size or resource needs of each nation. It is logical therefore that WA (and consequently Australia), with its above average mineral wealth and below average population[19] should be a net exporter of mineral and energy products. In fact, according the US Geological Survey's most recent commodity summaries on global commodity production[20], Australia is:

- The largest producer of iron ore (36%), lithium (60%) and bauxite (25%);
- The second largest producer of gold (9.5%), alumina (14.6%), diamonds (27%) and rare earths (12%);
- The third largest producer of ilmenite (13%) and zinc (7.2%);
- The fifth largest producer of cobalt (3.4%);
- The sixth largest producer of copper (4.5%) and nickel (7.4%);
- The seventh largest producer of silver (4.4%).

Production of mineral resources and downstream processing (such as alumina production, lithium hydroxide refining, silicon smelting) can be energy and emissions intensive however given the abundance of natural gas, use of technology and automation, and a highly skilled labour force, WA is well placed to be a lower emissions intensive producing jurisdiction for these products compared to many other global locations. WA is also globally recognised as an innovation leader for resources, so would be reasonably expected to continue to further improve efficiencies and reduce emissions in order to maintain a competitive advantage over other jurisdictions. It is important that the efficiency and productivity of WA's industrial activities are recognised in any State policy to ensure these necessary activities are not off-shored to higher emitting jurisdictions, resulting in a worse global emissions outcome (commonly known as "carbon leakage").

According to the most recent State and Territories Greenhouse Gas Inventory report published by the Australian Government, Western Australia's combined greenhouse gas emissions for 2017 were 88.5Mt $CO_{2\text{-}}{}^{e}$, accounting for 16.6 per cent of Australia's total emissions[21] (see Figure 1). As emissions occurring in Commonwealth waters are allocated to a state or territory, the Western Australian accounts include offshore emissions associated with gas projects. Western Australia's emergence as a globally

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[18] Australia's Nationally Determined Contribution (Dated August 2015) available at https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Australia%20First/Australias%20Intended%20Nationally%20Determined%20Contribution%20to%20a%20new%20Climate%20Change%20Agreement%20-%20August%202015.pdf

[19] The ABS estimates Australia has a population of 25.5 million (https://www.abs.gov.au/ausstats/abs%40.nsf/94713ad445ff1425ca25682000192af2/1647509ef7e25faaca2568a900154b63?OpenDocument), representing approximately 0.33% of the world's population

[20] US Geological Survey Commodity Summaries 2019 available at: https://www.usgs.gov/centers/nmic/commodity-statistics-and-information#L.
All percentages shown are the Australian production in 2018 as a percentage of global production in 2018.

[21] The Department of Environment and Energy is responsible for publishing Australia's national account of greenhouse gas emissions and has been tracking Australia's greenhouse gas emissions since 1990. This information is provided annually with quarterly updates and is made publicly available via the Department's website including details by state/territory and by sector of the economy. Data used is from Department of Environment and Energy, State and Territory Greenhouse Gas Inventories 2017, June 2019, https://www.environment.gov.au/system/files/resources/917a98ab-85cd-45e4-ae7a-bcd1b914cfb2/files/state-territory-inventories-2017.pdf

significant exporter of liquefied natural gas (LNG) in recent years has contributed to an increase in Scope 1 and Scope 2 emissions attributed to the Western Australian state account (see figures below). This same time period (over which National Accounts are available) has also coincided with an unprecedented "mining and construction boom" in Western Australia, driven primarily by the growth of China which is attributed to have raised 600 million people out of poverty. Thus, although Western Australia's emissions have risen moderately over this period (including proceeding the emergence of the natural gas sector), the rate of production output has substantially outstripped this increase in emissions. The demonstrated efficiency with which the Western Australian resources sector has responded to meet global demand should be celebrated. (See Figure 2).

At the same time, it is recognised that this growth presents a unique challenge for Western Australia (and Australia) in ensuring global demand for critical minerals is met through economically and emissions efficient means. This balancing act, and the linkage to intensified global trade competitiveness, further highlights the importance of a globally coordinated approach to emissions reduction (through the Paris Agreement) and the risk of perverse outcomes and distortions from sub-national schemes.

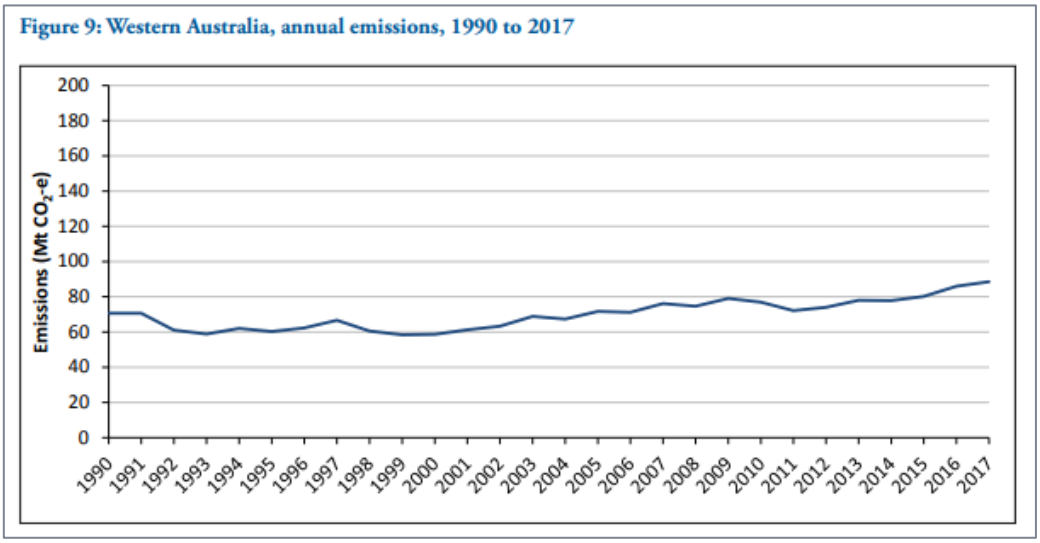

Figure 1 WA Emissions Data
(Image Source: Department of Environment and Energy, 2019)

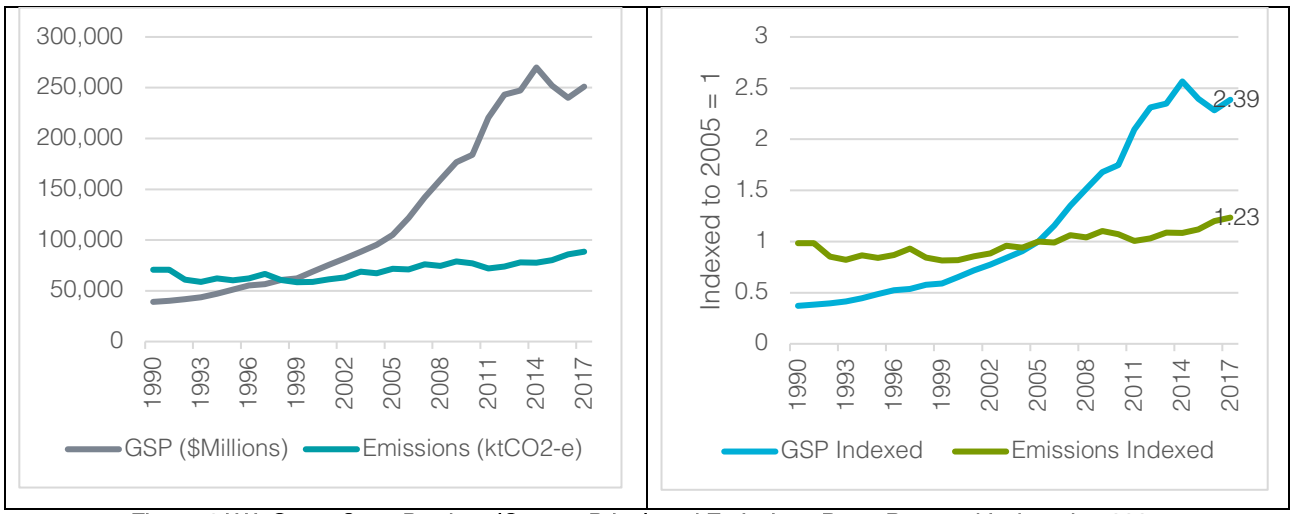

Figure 2 WA Gross State Product (Current Price) and Emissions Data: Raw and Indexed to 2005
(Emissions Data Source: Department of Environment and Energy, 2019[22].
Gross State Product Data Source: Australian Bureau of Statistics, 2019, Data Series 5220.0 Australian National Accounts: State Accounts Table 6. Expenditure, Income and Industry Components of Gross State Product, Western Australia, Chain volume measures and current prices)[23]

[22] Department of Environment and Energy, State and Territory Greenhouse Gas Inventories 2017, June 2019, https://www.environment.gov.au/system/files/resources/917a98ab-85cd-45e4-ae7a-bcd1b914cfb2/files/state-territory-inventories-2017.pdf

[23] Data series available at https://www.abs.gov.au/Ausstats/abs@.nsf/exnote/5220.0

The following sections respond specifically to relevant themes within the Issues Paper.

1 Transforming Energy Generation

A key means through which the WA resources sector (like the transport and other sectors) will transition towards a lower emissions future is through increased electrification. Like any transition, this will take time to allow for equipment upgrades, changes in heavy equipment, grid re-design, firming and capacity changes and other necessary enablers of increased electrification. Combined with reduced emissions intensity for state-owned network electricity generation, this transformation will over time reduce the emissions intensity of WA.

CME notes that WA's electricity supply is of lower emissions intensity than is available in much of Australia, largely due to the high proportion of natural gas usage. The emissions intensity of the SWIS has decreased in recent years due to the addition of renewables, contributing to the WA Government's recent announcement of the earlier closure of the coal fired Muja C plant[24]. The SWIS, its power generation and fuel sources are largely controlled by the WA State Government through Government Trading Enterprises (GTEs). As many resource sector projects source their electricity from the SWIS, the emissions intensity of their electricity usage (Scope 2 emissions) is largely driven by decisions made by the WA Government. CME supports a measured transition of the SWIS to a lower emissions intensity in a manner that preserves its reliability and affordability. The need for a measured transition, recognises that a balance is needed between the speed of transitioning to lowering emissions generation sources alongside the implementation of complimentary measures to balance network reliability and supply stability. An arbitrary timeframe for emissions reduction may be unrealistic and counter-productive if not pursued in lock step with other necessary adjustments. CME notes surety, reliability, affordability and sustainability are equal cornerstones of the recently released WA Government's "Energy Transformation Strategy"[25] and strongly supports this aspect.

The use of lower emissions fuel combined with increased storage and integration of renewables is increasingly occurring, particularly in fridge of grid and off-grid situations where resource sector projects are often located. Several recent examples help illustrate this transformation within the WA resources sector:

- In October 2019, FMG announced a partnership with Alinta Energy for the "Chichester Solar Gas Hybrid project" which will see the construction of a 60MW solar photovoltaic generation facility providing electricity for FMG's Christmas Creek and Cloudbreak mining operations. In addition, an approximately 60-kilometre transmission line will link the Christmas Creek and Cloudbreak mining operations with Alinta Energy's Newman gas-fired power station and a 35MW battery facility will be constructed. Once completed (due mid-2021), up to 100 per cent of daytime stationary energy requirements for the two FMG mining operations will be provided by solar generation, with the remaining power requirements to be met through the integrated battery storage and intermittent gas fired power, displacing as estimated 100 million litres annually of diesel currently used for on-site power generation[26].
- Gold Fields' Agnew Gold Mine, located in the northern goldfields approximately 390km from Kalgoorlie, has installed a renewable microgrid which consists of five wind turbines delivering an 18 MW wind farm, a 10,000 panel 4 MW solar farm and a 13 MW / 4 MWh Battery Energy Storage System with security and reliability of a micro-grid underpinned with a 16 MW gas engine power station[27]. At the time of writing, the gas and solar components of this integrated system have been commissioned, with the wind and battery components to be commissioned by mid-2020.
- Roy Hill Holdings has implemented several initiatives to reduce the emissions intensity of its electricity usage including removing remote site diesel generator usage through installation of a 33KV overhead distribution power line to connect to the mine site grid, replacement of the port's on-site diesel generation with grid connection to the north west integrated system (NWIS) which generates electricity from natural

[24] Premier McGowan Media Release, 5 August 2019, https://www.mediastatements.wa.gov.au/Pages/McGowan/2019/08/Muja-Power-Station-in-Collie-to-be-scaled-back-from-2022.aspx

[25] Energy Transformation Strategy: A Brighter Energy Future (August 2019) https://www.wa.gov.au/sites/default/files/2019-08/Energy-Transformation-Strategy.pdf

[26] FMG Media Release, 18 October 2019 https://www.fmgl.com.au/docs/default-source/announcements/1986209.pdf

[27] ARENA Media Release https://arena.gov.au/assets/2019/06/ARENA-Media-Release_-Gold-Fields-Renewable-Hybrid-Powers-Mine190619.pdf

gas, and installation of small-scale solar in combination with batteries to displace diesel generation. Roy Hill are investigating other initiatives to incorporate renewable energy and increase overall sustainability.

- During the 2019 Financial Year, Mineral Resources Limited (MRL) invested in several different activities that reduced the greenhouse gas emissions intensity of their operations. These included:
    - Expansion of the Mt Marion Power Station, which involved installation of a new gas fuelled generator to increase installed power generation capacity to 11MW, additional LNG storage tanks to increase onsite fuel supply, additional vaporisation capacity, and the Battery Energy Storage System (BESS). Combined, the upgraded Mt Marion Power Station emitted approximately 6,500 tCO_2^{-e} less during the 2019 FY compared to a diesel power station whilst the BESS is estimated to achieve a 12% reduction in fuel usage moving forward, resulting in a reduction of approximately 2,500 tCO_2^{-e} compared to performance prior to battery installation;
    - New Wodgina natural gas fuelled power station, which has an installed capacity of 64MW and the new Wodgina 10-inch pipeline to supply natural gas to the Wodgina power station. This project is expected to result in emissions approximately 20,000 tCO_2^{-e} less compared to a diesel power station.
    - Installation of solar photovoltaic (PV) at MRL Perth offices and workshops which during the 2019 financial year avoided 635 tCO_2^{-e} of Scope 2 emissions.
- As part of CITIC Pacific Mining's continued commitment to sustainability, the Balmoral Gatehouse is powered by a renewable energy using solar hybrid power. The system uses 96 solar panels with a battery bank to store the energy, using a diesel generator as backup.

As these examples outline, the WA resources sector is already undertaking significant steps to lower emissions associated with electricity supply and usage, and is proactively investigating innovative and viable options to further drive efficiencies and reduce emissions. Multiple factors will however affect the viability and specific options available for a resource sector project including: remaining operational life, proximity of the grid and capacity, proximity of the Dampier to Bunbury Gas Pipeline, reliability requirements (particularly for downstream processing and refining applications), existing purchase and supply agreements, cyclone activity and resulting impacts on asset design requirements and the need to "island" or protect a facility from grid interruptions.

In some instances, Commonwealth Government schemes (most notably Australian Renewable Energy Agency funding) support implementation of lower emissions electricity generation for the WA Resources Sector. CME supports the continue access of eligible WA resources sector projects to these schemes.

A remaining challenge for the WA Government will be how to ensure the State is not deprioritised or neglected as part of the wider Australian transition of electricity generation. The National Energy Market (NEM), which does not include WA, is a dominant focus of the Commonwealth Government in terms of both cost and reliability with several noteworthy supply interruptions in recent times. As WA has to date not suffered the severity of issues being experienced by States on the NEM, WA has not required the same level of Federal Government attention. Additionally, as previously mentioned, WA's electricity supply is currently a lower emissions intensity supply compared to most other parts of Australia and therefore a lower focus for emissions reduction. This is evident in the outcomes of the most recent (as well as prior) COAG Energy Council Meetings where consideration of the NEM dominates as well as being reflected in the high level of investment through the Climate Solutions Package in to the key NEM-associated projects "Battery of the Nation" and "Snowy 2.0". There is also a risk that current and future Commonwealth Government energy and emissions policies will create distortions which will incentivise investment in the NEM displacing investments in to WA where those investments (in the absence of Commonwealth Government incentives) would have otherwise progressed. This may be further exacerbated by the heavy involvement of GTEs in the WA electricity market. **CME recommends the WA Government remain strongly engaged through the COAG Energy Council and other relevant multi-jurisdictional processes and Commonwealth Schemes to ensure distortions do not emerge that disadvantage WA and to ensure that WA receives reasonable access to Commonwealth support for its electricity transformation.**

2 Industry Innovation

As shown in Figure 1, WA is already demonstrating clear leadership in increasing the economic value derived from our energy use (emissions), by the strong growth in gross state product (GSP) compared to the growth

in emissions. The WA resources sector has contributed to this improvement in efficiency including the following examples:

- In August, Chevron Australia announced the safe start up and commencement of operations for its Gorgon Carbon Dioxide Injection Project. This is believed to be the largest greenhouse gas mitigation project to be undertaken by industry globally and positions Western Australia as a global leader in this technology. Once fully operational it is anticipated to reduce greenhouse emissions from the Gorgon Project and Western Australia by between 3.6 and 4.0 million tonnes CO_2^{-e} per year or by over 100 million tonnes CO_2^{-e} over the life of the project.
- BHP Western Australia Iron Ore has reduced the greenhouse gas emission intensity of iron ore production by 11 per cent over the past five years. This has been achieved in-part through the integration of technology to recover waste heat from electricity generation, enabling the generation of additional power, increasing energy efficiency and reducing carbon emission intensity[28].
- Between 2016 and 2018, Woodside improved its energy efficiency by 3.4% against baseline performance is on track to achieve a 5% efficiency improvement by 2020. Energy efficiency improvements implemented in 2018 included increasing the operating pressure of the Pluto LNG processing train, to facilitate an increase in annual LNG production for no extra energy input, turning off a compressor at Karratha Gas Plant's domestic gas facilities when energy demand is low to save more than 1,000 tonnes of fuel per month when applied[29].
- CITIC Pacific Mining has invested in a 51 gigalitre per year desalination plant to meet the water requirements. By choosing to include energy recovery units, the desalination plant is able to use the residual pressure in the reject water stream to boost the pressure of about 50 per cent of the incoming seawater feed. This significantly reduces the amount of energy required for the process, by recycling energy that would otherwise be lost and is expected to reduce emissions approximately 27,500 tonnes of CO_2^{-e} per year. Additionally, at the Sino Iron project, CITIC Pacific Mining constructed a 480 megawatt gas fired combined-cycle power station. The combined cycle mode uses the waste heat to generate further electrical energy through reuse of the steam power energy. The alternative design, an open-cycle plant, would lose nearly half of its energy produced in heat demonstrating the benefit of heat recovery and reuse processes with a combined cycle plant. The combined-cycle power station was recognised by the Energy Efficiency Council as 'Best Industrial Energy Efficiency Project' in 2012[30] and it is expected to reduce emissions by approximately 440,000 tonnes of CO_2^{-e} per year.
- Rio Tinto Iron Ore (RTIO) operates a fleet of more than 200 Komatsu 830E/930E haul trucks in the Pilbara region. In 2017, RTIO commenced a six year programme to replace the engines in these trucks at scheduled overhaul with upgraded engines in conjunction with fuel saver control technology. When the project is completed for the entire fleet in 2022, the total fuel savings will be in excess of 20 million litres of diesel per year, with an equivalent annual emissions reduction of around 60,000 tCO_2^{-e}.

CME noted the WA Government's release of its "Greenhouse Gas Emissions Policy for Major Projects"[31] in August 2019 a first step in providing investment certainty for industry. This Policy acknowledged the important role of the Commonwealth Government for management of emissions and existing national frameworks relevant to the WA resources sector. CME is therefore concerned by inclusion in the Issues Paper of a specific question "what exemptions should apply to trade-exposed sectors in reducing our emissions" as this question implies state-based restrictions will be applied. As detailed earlier, **CME supports a national framework for emissions reductions that promotes lowest cost abatement, and views any consideration of trade-exposed sectors as best addressed through a national market-based scheme – particularly noting the Commonwealth Government's primary responsibilities for international trade**. Any introduction of sub-jurisdictional restrictions will introduce the risk, particularly for downstream processing, of loss of industry to other Australian States and Territories as well as overseas where those industries would have otherwise have been competitive based in WA.

A key opportunity for WA in the lower emissions global economy is the potential to become a dominant supplier in a future hydrogen market. WA has several important comparative advantages that highlight the

[28] BHP, 2019, https://www.bhp.com/community/case-studies/2019/09/keeping-greenhouse-gas-emissions-reductions-rolling

[29] Woodside 2018 Sustainable Development Report https://files.woodside/docs/default-source/sustainability-documents/sustainabledevelopment-report-2018-related-documents/sustainable-development-report-2018.pdf?sfvrsn=95b0db3_0

[30] Annual Award Winners http://www.eec.org.au/events/national-energy-efficiency-awards/2012-award-winners#/2012-award-winners

[31] https://www.der.wa.gov.au/images/documents/your-environment/climate-change/Greenhouse%20Gas%20Emissions%20Policy%20for%20Major%20Projects.pdf

tremendous opportunity for the State including proximity to key markets, existing infrastructure, relevant industry knowledge and experience largely driven through our existing globally significant LNG sector, skilled and highly educated workforce, land area and potential for renewable electricity generation. These comparative advantages are outlined in detail in the WA Government's "Renewable Hydrogen Strategy"[32]. CME supports the adoption of this Strategy and further notes that the COAG Energy Council has now released Australia's "National Hydrogen Strategy"[33].

The WA Government, with the Commonwealth Government and in coordination with the COAG Energy Council, should continue to support and enable the development of the hydrogen industry in WA.

Given the State's mineral wealth, WA also has a significant opportunity to increase its involvement in the battery supply chain, including in downstream processing. This has been illustrated recently by the several significant investments by companies into local lithium hydroxide (chemical grade) manufacturing and further nickel processing. Additionally, expanded opportunities in rare earths are also being pursued and of increased strategic importance to Western Australia and the nation. Critically, these 'battery minerals' compete in globally competitive markets and should WA wish to further develop a future battery industry, including elements of downstream processing, it is essential that these industries are supported with continued access to affordable electricity, highly skilled workforces, competitive royalty schemes, all within an efficient and transparent assessment and approval processes. CME supports the ongoing work of the Future Batteries Industry CRC in its efforts to further a productive, local battery minerals industry.

Poorly considered climate policy could significantly erode the potential of these new energy industries.

The WA Government must also recognised there is an element of risk with industry innovation and not all attempts to innovate in emissions reduction will necessarily produce the desired results and, in turn, reduction in emissions to the desired levels. It has recently been industry's experience that attempts by companies to voluntarily invest in innovation and other proactive measures to progress emissions reduction have become regulatory requirements then used to penalise innovative and progressive companies that have sought to innovate. Punishment for poorer than hoped outcomes creates a significant disincentive for industry to innovate and reduces entrepreneurial activity in WA. **The WA Government and its regulatory processes should carefully consider both the incentives and disincentives it creates for industry innovation and entrepreneurial activities**.

CME encourages the WA Government to continue to commit to the South West Hub Project[34], administered by Department of Mines, Industry Regulation and Safety (with assistance from the Commonwealth Government). If this opportunity is successfully proved up, it could potentially provide for a multi-industry facility for carbon capture and storage ideally located in the South West alongside some of the State's key industrial regions. If successful, the WA Government could in future offer industrial lands fully serviced for water, electricity, gas and carbon sequestration – which would constitute a unique and sought after service provision for future industry. It is CME's understanding that further progress on the South West Hub could be supported through further Government investment.

There is also potential for WA to pursue opportunities in mineral carbonation, a chemical pathway to capture and geologically store atmospheric carbon dioxide through the formation of stable mineral carbonates. Tailings materials from certain resource sector projects may be rich in potential carbonate forming materials. Previous studies[35] have highlighted Australia's potential for carbon sequestration in tailings residues, which if enhanced could create a significant additional source of abatement. Given the ongoing production of tailings in WA associated with the resources sector, the WA Government should pursue opportunities to facilitate further research and investment in mineral carbonation.

4 Regional Prosperity

The resources sector is a key contributor and in many instances, primary employer, in regional communities across WA. In some regional areas where the resources sector operates however, there is an absence of diversity in the economic base which can leave regional communities more vulnerable to inevitable

[32] http://www.drd.wa.gov.au/Publications/Documents/wa_renewable_hydrogen_strategy.pdf

[33] https://www.industry.gov.au/sites/default/files/2019-11/australias-national-hydrogen-strategy.pdf

[34] South West Hub Project information is available at: https://www.dmp.wa.gov.au/South-West-Hub-CCS-1489.aspx

[35] See summary "Opportunities for Mineral Carbonation in Australia's Mining Industry https://www.mdpi.com/2071-1050/11/5/1250

commodity price cycles. CME supports increased economic diversification of regional communities as an obvious means through which to improve their resilience.

Carbon farming presents one diversification opportunity that may be of relevance to multiple WA regional economies. CME has been actively engaging with the WA Government to support policy development necessary for the establishment of carbon farming in specified rangeland areas in WA. In particular, CME is keen for the **WA Government to finalise its policy work to provide certainty on issues affecting carbon rights and eligible interest holder consent for human-induced regeneration (HIR) projects in a manner that appropriately balances and fosters multi-land use considerations**. Once formalised, this should enable greater uptake by WA of the Commonwealth Government's Emissions Reduction Fund (transitioning to the Climate Solutions Fund). To date, WA has rarely participated in this multi-billion dollar Commonwealth scheme, with Queensland and New South Wales receiving most of the funds.

CME also encourages the WA Government to work collaboratively with the Commonwealth Government to further enhance other opportunities to deepen the WA offsets market. This may require the WA Government to assist the Commonwealth in establishing new or amended methodologies. In general, **CME supports initiatives that will lead to a deepening of the available offsets market as part of ensuring sufficient access to low cost abatement options. This include ensuring connectivity to international markets**.

Some carbon farming projects may also generate "co-benefits" such as improved biodiversity outcomes or remote Aboriginal employment on-country. The WA Government should ensure any co-benefits from carbon farming projects can be explored and recognised, but CME does not support the inflating or arbitrary biasing of particular carbon offsets with regard to co-benefits as this would be contrary to pursuit of lowest cost abatement and may corrupt the fungibility of offsets (as Australian Carbon Credit Units) in to and out of WA. Where applicable, the producers should be allowed to pursue their own price premiums for these co-benefits within contracts arrangements so long as Government regulations does not penalise or interfere with recognition of these co-benefits.

CME supports resolution of an international trading framework under Article 6 of the Paris Agreement.

5 Waste Reduction

CME supports efficient and sustainable natural resource usage including appropriate reuse of mineral by-products, leading to reduced natural resource consumption and supporting a circular economy. At present, the WA legislative framework inhibits safe and environmentally sustainable reuse of several key mineral materials and instead promotes greater use of natural resources including requiring additional native vegetation clearing to access these new raw materials. CME is aware of the WA Governments intentions to resolve these framework and policy issues within the coming 18-24 months and is actively engaged as a member of the WA Government's Waste Reform Advisory Group to assist this process.

CME would support the extension and expansion of the Main Roads WA's "Road to Reuse" programme including allowing other input materials to be considered where these material meet the requirements already specified by Main Roads WA. Reuse of materials for road construction is an obvious means through which to decrease raw natural resource consumption, new native vegetation clearing and improve waste management and land outcomes that should be actively pursued by the WA Government.

7 Water Security

Water security and adaptation to a drying climate are particularly important issues for the WA Government, with several factors in the South West of WA making water security in this region a particular adaptation priority. The South West has been experiencing decreasing rainfall which compounds to create an even greater decrease in runoff. With respect to demand, most of WA's population growth is in the South West as is most of the heavy industry as well as large areas of water intensive agriculture. This creates a demand pressure and potential for increased water competition or conflict.

A further source of water competition may also be generated by the hydrogen industry as, for the industry to emerge strongly in WA, a secure, clean water source will be essential. Additionally, WA is actively attracting further downstream processing activities (particularly related to battery minerals) in to industrial estates in the South West - such as Kwinana and Kemerton - and all these processing facilities will require secure, affordable water supplies.

Despite announcing water reform as a priority in August 2018, there appears to have been no meaningful progress on reform water legislation in WA with the primary legislation - the *Rights in Water and Irrigation Act*

1914 - is now well over 100 years old. The water reform was at least in part, to ensure WA had a water allocation system that was fit for purpose in to the future, capable of managing the altered water availability, adaptation needs and changes in economic circumstances that have emerged since the turn of the last century. **CME recommends the WA Government commence consultation regarding water legislation reform and prioritise the modernisation of WA's legislative framework**.

It is also important for the WA Government to be mindful that in industrial applications, there is often a trade-off between water efficiency and energy efficiency as after a point, increasing water capture requires significantly more energy and further processing so there will be a tension balancing water and energy efficiency (for example, dry-stacking tailings). This additional investment can also material affect the viability of some projects.

9 Resilient Infrastructure and Businesses

Infrastructure asset owners will typically be best placed to design and maintain equipment to be resilient through certain climatic conditions, however ensuring asset owners have access to accurate information and forecasts will greatly assist with this design and maintenance work. For example, it will likely be unrealistic for any one mine in a region to develop a detailed climatic model or install an extensive weather monitoring network, whereas the WA Government, in cooperation with the Bureau of Meteorology and other Commonwealth agencies (such as CSIRO) would be well placed to do so. This information should be made publicly available to ensure increased use by the greatest number of people and companies, thereby supporting the State's overall resilience. The Indian Ocean Climate Initiative[36], a partnership between the WA Government, the Bureau of Meteorology and the CSIRO, is seen as a good example of how the WA Government could complete make available further information and data needed to assist businesses with their resilience and planning.

To support this, it may be necessary for additional radar and other monitoring capabilities to be installed at key locations in WA. At present, there are no high resolution Doppler radars in WA north of Geraldton[37].

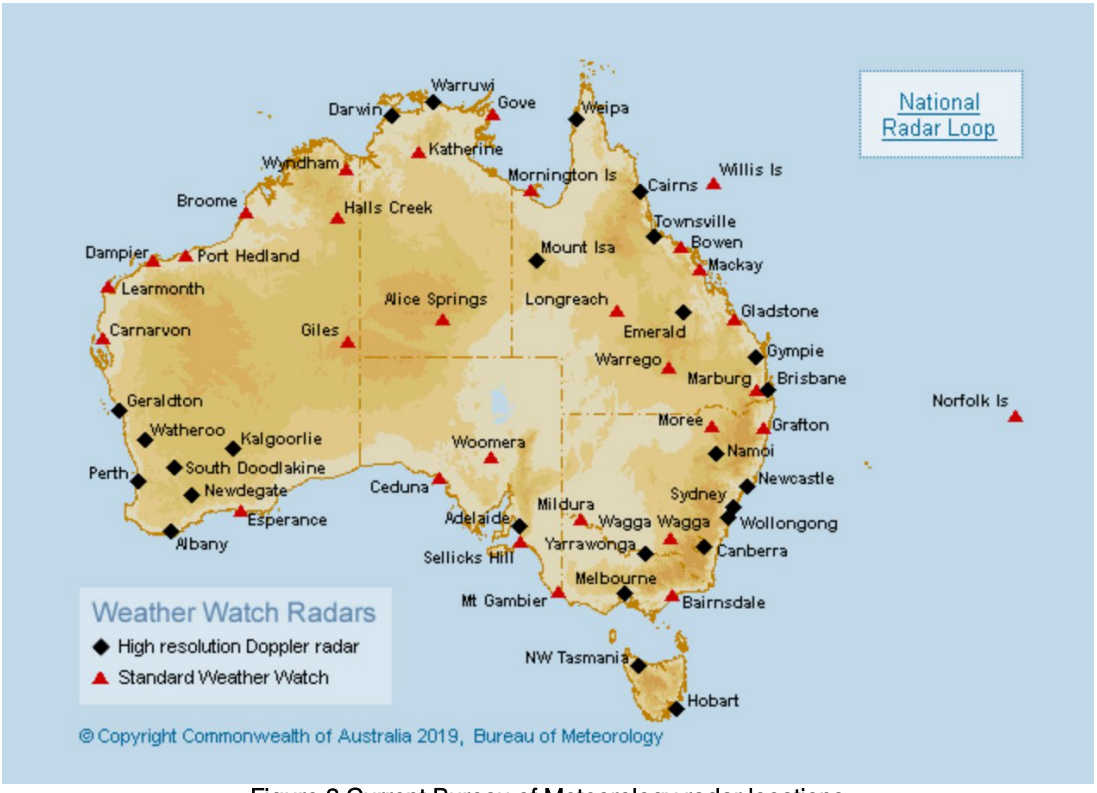

Figure 3 Current Bureau of Meteorology radar locations
(Image source: http://www.bom.gov.au/australia/radar/)

[36] For further information: http://www.ioci.org.au/

[37] List of WA-based Bureau of Meteorology facilities available at http://www.bom.gov.au/australia/radar/wa_radar_sites_table.shtml

10 Protecting Biodiversity

As previously mentioned[38], where there are legitimate co-benefits associated with greenhouse gas emissions offsets (such as for human-induced regeneration and some other forms of carbon farming), the WA Government should ensure that these co-benefits can be recognised in a manner that does not detract from or inhibit pursuit of lowest cost abatement.

Of relevance to the resources sector, altered fire regimes may over time affect the success of rehabilitation efforts or may require that native vegetation returned is different (eg: in terms of species or abundance) to that which pre-existed, due to the need to adapt to altered fire regimes or rainfall patterns in some areas.

There may also be a need for the WA Government to increase focus on feral animal control (and other threatening processes) in order to reduce the overall burden and threat to WA's own biodiversity. For example, feral animals may out compete native animals for access to scarce water or food sources which may be exacerbated if there is a drying climate and altered fire regime. Better management of feral animals will likely also create benefits for increased carbon sequestration (carbon credits) so it may be appropriate for the State Government to work with the Commonwealth to quantify the value of this and if appropriate, develop an applicable methodology.

Other

CME is concerned the WA Government may seek to establish a state-based accounting and reporting system separate to the national reporting framework for greenhouse gas emissions. Relevantly the WA Government, through a data sharing agreement with the Commonwealth Government, already has access to the information already collected and reported (in addition to and beyond that which is publicly available). Should the WA Government desire additional analysis of this data or have other requirements, it should work collaboratively with the Department of Environment and Energy and the Clean Energy Regulator to implement further improvements rather than seek to create a separate or additional reporting burden on WA businesses.

CME notes, the Clean Energy Regulator and the Department of Environment and Energy both make data and reports publicly available via their websites.

Conclusion

CME welcomes the opportunity to provide comment on the Climate Change in Western Australia Issues Paper and looks forward to ongoing engagement with the WA State Government during its finalisation and subsequent implementation.

If you have any further queries regarding the above matters, please contact Bronwyn Bell, Manager Policy – Natural Resources.

Authorised by	Position	Date	Signed
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[38] See section 4 Regional Prosperity and the discussion on carbon farming