



CCIWA Response

Climate Change in Western Australia Issues Paper

6 December 2019

Introduction

The Chamber of Commerce and Industry of Western Australia (CCIWA) welcomes the opportunity to provide input to the State Government's climate change issues paper.

Addressing the serious matter of climate change requires a coordinated, national approach that appropriately considers social and environmental factors while preserving economic growth. Through its climate change policy, the State Government should clearly define how it sees its role in addressing climate change, and how this relates to other tiers of government. It is essential that the purpose of the policy is clearly defined, and the State Government articulates what it is setting out to achieve.

Due to the energy intense and export-oriented nature of WA's economy, the State's climate change policy must carefully consider the impacts on economic policy, investment and trade and energy policy. WA's economy has a strong export focus, contributing to nearly half (43 per cent) of Australia's merchandise exports in 2018-19.¹ As of September 2019, WA has an estimated \$108 billion worth of major resources projects in the pipeline, including \$25 billion in the construction or committed stage and \$82 billion in planned or possible new projects.² These projects will be a crucial source of future economic growth and job creation for WA. CCIWA supports cost-effective action to reduce Australia's greenhouse gas emissions, but it is important to also protect the competitiveness of our trade-exposed industries and provide investment certainty for businesses.

The State Government should not duplicate the regulation of emissions as this will impose additional cost on businesses. As it is the responsibility of the Federal Government to ensure Australia meets its international obligations under the Paris Agreement, the State Government's policy should reaffirm support for measures and targets that align with both the Paris Agreement and the Federal Government's emissions reduction targets.

Transforming energy generation

► What are the main challenges for decarbonising Western Australia's electricity supply while ensuring adequate generation capacity, security and reliability?

One of the main challenges for decarbonising WA's electricity supply is the integration of renewables into the State's main electricity grid, the South West Interconnected System (SWIS).

¹ Department of Jobs, Tourism, Science and Innovation, *Western Australia Economic Profile, October 2019*. Accessed from:

https://www.jtsi.wa.gov.au/docs/default-source/default-document-library/wa-economic-profile---october-2019.pdf?sfvrsn=7f13701c_4

² Department of Mines, Industry Regulation and Safety, *Industry Activity Indicators*. Accessed from: <http://www.dmp.wa.gov.au/About-Us-Careers/Latest-Resources-Investment-4083.aspx>

There has been exponential growth in the number of residential rooftop solar photovoltaic (PV) systems installed in the SWIS, with the installed capacity of these systems increasing from virtually zero ten years ago to over 1,000 megawatts (MW) in 2019. The combined capacity of rooftop solar PV is now three times greater than any other single generator connected to the SWIS. This is a substantial level of solar PV penetration in a system with a peak demand of around 4,000MW, average demand of 2,000MW and minimum demand of 1,200MW.³

The high level of solar PV installations is making management of the SWIS more challenging and is resulting in inefficiencies within the Wholesale Electricity Market (WEM), including:

- **Increased variability:** This necessitates the rapid ramping up and down of thermal generators to meet demand when solar output drops due to cloud cover or the sun setting in the afternoon. These fluctuations in output are increasing the maintenance costs and failure of conventional thermal generators, which are designed to run constantly at a relatively stable level of output.
- **Power quality:** High levels of uncontrolled solar PV being exported to the grid are making it increasingly difficult to maintain voltage and frequency across the system. This has implications for system security and cost.

The uptake of small and large-scale renewable energy sources is expected to continue for the foreseeable future. Under a 'business as usual' scenario, the Australian Energy Market Operator (AEMO) and the WA State Government's Public Utilities Office (now Energy Policy WA) expect the combined share of rooftop solar and large-scale renewable (wind and solar) of the SWIS generation mix to increase from just over 16 per cent in 2018-19 to about 35 per cent in 2030.

Conversely, the role of coal in the generation mix is anticipated to drop from its current share of 51 per cent to about 3 per cent in 2030, while gas is expected to remain relatively steady as its share moves from 33 per cent to 30 per cent over the forecast period.⁴

► What are the most effective ways to overcome these challenges by 2030?

As the share of intermittent renewable generation on the SWIS continues to increase, so will the frequency and severity of the grid management challenges and market inefficiencies outlined above. A range of technological and market design solutions will need to be implemented by system planners, operators and other market participants to

³ A. Zibelman, 2019. *Managing the energy transition*. Accessed from: https://ceda.com.au/CEDA/media/Attachments/2019/PDF/03/W190308_Zibelman_Presentation.pdf.

⁴ Department of Treasury, 2019. *The Energy Transformation*. Accessed from: https://www.treasury.wa.gov.au/uploadedFiles/Site-content/Public_Utility_Office/Industry_reform/Energy_Transformation.pdf.

better integrate an increasing amount of intermittent renewable generation within the grid.

Technical solutions currently include but are not limited to battery storage systems (including electric vehicles), synchronous condensers, direct load control and demand response incentives. Fast-response gas generators will also be crucial to managing the variability of renewable energy generation.

Appropriate market design and pricing mechanisms are important enablers of these technical solutions as they will provide investment signals to market participants and ensure a return on investment. The private sector will have a key role in investing these technical solutions as it is a considerable source of knowledge, innovation and funding. This capability should be encouraged to contribute to the efficient transition of the electricity sector. Additionally, enabling private sector investment will shift financial risk away from government as the electricity sector continues its transition.

We note that the State Government's current electricity sector reform program is aiming to implement a market design and regulatory framework that will facilitate the integration and management of intermittent generation technologies. In pursuing this agenda, it is important that the State Government continues to undertake consultation with industry, particularly regarding ongoing arrangements for investments that have been made under pre-reform market and regulatory settings.

Industry innovation

► What measures have been implemented by your business to lower energy use or emissions?

Businesses with a Western Australian presence and operations actively developing technology and projects to lower energy use and emissions include (but are not limited to):

- ATCO Australia, with support from the Australian Renewable Energy Agency (ARENA), opened its Clean Energy Innovation Hub at Jandakot in July 2019. This project is testing hybrid energy solutions involving the integration of natural gas, solar photovoltaics, battery storage and hydrogen production.⁵
- The Asian Renewable Energy Hub project is led by a consortium that includes Macquarie Group and will involve the development of over 15,000MW of renewable generation capacity in the Pilbara region. 3,000MW of this capacity is to be directed to supplying electricity to large local energy users, with the remaining capacity to be directed to green hydrogen production for domestic and export markets. The project

⁵ ATCO, 2019. *Clean energy innovation hub*. Accessed from: <https://yourgas.com.au/energy-future/clean-energy-innovation-hub/>

has been granted 'Lead Agency' status by the WA Government and a final investment decision is scheduled for 2022-23.⁶

- Fortescue Metals Group recently announced an agreement with Alinta Energy to construct a 60MW solar PV generation facility to power Fortescue's iron ore operations at the Chichester Hub. This will supply 100 per cent of daytime stationary energy requirements, with the remaining power being met through integrated battery storage and gas power facilities. The project will receive Federal funding of \$24.2 million from the Australian Renewable Energy Agency (ARENA) and a \$90 million loan from the Northern Australia Infrastructure Facility (NAIF).
- Fortescue Metals Group has entered a \$20 million partnership with CSIRO to develop a metal membrane technology that will enable ammonia to be used as a carrier for hydrogen storage and transport.
- Woodside Energy is pursuing the development of export markets and hydrogen refuelling infrastructure based on hydrogen derived from natural gas with bio-sequestration and from renewable sources. Woodside recently signed an agreement with Korea Gas Corporation (KOGAS) to study green hydrogen and the feasibility of a green hydrogen pilot project.⁷
- Yara Pilbara is collaborating with ENGIE (another global energy player) on a feasibility study for a demonstration-scale (100MW solar, 66MW electrolyser) pilot project to produce renewable ammonia for export-based on hydrogen from solar electrolysis using the company's existing ammonia production and export infrastructure in the Pilbara.
- EDL and Gold Fields recently opened stage one of the Agnew Hybrid Renewables Project that includes a 23MW power station integrating PV solar with gas and diesel. Stage two, supported by \$13 million ARENA funding, will add 18MW of wind generation, a 13MW battery and an advanced micro-grid control system providing the mine with more than 50 per cent renewable energy in the next decade.⁸
- Australia's first thermal waste-to-energy plant is being built in Kwinana, co-developed by Macquarie Capital and Phoenix Energy Australia. It will divert 400,000 tonnes of waste from landfill each year and export up to 36MW of electricity into the SWIS, enough to power more than 50,000 households.⁹

⁶ Asian Renewable Energy Hub, 2019. *The Asian Renewable Energy Hub*. Accessed from: <https://asianrehub.com/>

⁷ H2-View, 2019. *Woodside and KOGAS sign agreement for green hydrogen pilot project*. Accessed from: <https://www.h2-view.com/story/woodside-and-kogas-sign-agreement-for-green-hydrogen-pilot-project/>

⁸ EDL and Gold Fields, 2019. *First stage of landmark Agnew hybrid renewable project powers up*. Accessed from: <http://www.overend.co.za/download/1120nov2019gfiledjointmediareleaseagnewmicrogrid.pdf>

⁹ Australian Renewable Energy Agency, 2018. *Kwinana Waste to Energy Project*. Accessed from: <https://arena.gov.au/projects/kwinana-waste-to-energy-project/>

- GMA Garnet with Advanced Energy Resources has invested \$8 million into a wind and solar farm to meet 60 per cent of power requirements at the Port Gregory garnet sand mine. The facility will have peak output of 2.8MW.¹⁰

► How can the Government of Western Australia foster clean industries and technologies?

The State Government has an important role in supporting WA's industry in enabling the world to transition toward net zero emissions. WA produced 14 per cent of the global LNG supply in 2018.¹¹ A quarter of this supply was exported to China and India, providing a lower emissions energy source to displace domestic coal.¹² The Federal Government estimates that Australia's LNG exports have the potential to lower emissions in importing countries by approximately 148 Mt CO²-e in 2018.¹³ Furthermore, gas-fired generation has a crucial role in providing a flexible and responsive source of electricity supply in support of intermittent renewable energy generation.

The increased penetration of renewable energy in global electricity systems and decarbonisation of our transport systems will be largely enabled by battery technology. With an abundance of natural gas and an innovative resources sector, WA has the potential to produce materials used in batteries for electric vehicles and battery storage systems at lower emissions intensity than its global competitors. WA already has a crucial position in the global battery supply chain as a major exporter of battery minerals such as lithium, cobalt, nickel and alumina and is set to capitalise on opportunities for lithium hydroxide and nickel sulphate production, and potentially cobalt sulphate production.

CCIWA is supportive of the State Government's work promoting and growing WA industry through initiatives such as the Department of Jobs, Tourism, Science and Innovation's Future Battery Industry Strategy; and the Department of Primary Industries and Regional Development's Renewable Hydrogen Strategy. The State Government should ensure that its climate change policy does not result in increased production costs for commodities and technologies that are ultimately being used to support global efforts to reduce emissions across the global economy.

In addition to the measures outlined throughout this submission, CCIWA considers the role of the State Government in fostering clean industries and technologies is to support WA industry to innovate by minimising regulatory barriers to innovation. This could

¹⁰ Australian Renewable Energy Agency, 2019. *Port Gregory wind, solar and battery hybrid plant to power mine*. Accessed from: https://arena.gov.au/assets/2019/06/ARENA-Media-Release_AER-Port-Gregory-wind-solar-battery-hybrid-project-to-power-GMA-Garnet-mine-in-WA-190619.pdf

¹¹ Department of Jobs, Tourism, Science and Innovation. *Western Australia LNG Profile*. August 2019. <https://www.jtsi.wa.gov.au/about-the-state/major-resource-producer/lng-profile> [accessed 16 August 2019].

¹² International Energy Agency. *The Role of Gas on Today's Energy Transitions*. July 2019. https://www.iea.org/publications/roleofgas/?utm_content=buffer2f1d6&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer [accessed 29 July 2019].

¹³ Department of the Environment and Energy. *Media Release: Australia's National Greenhouse Gas Inventory December 2018 Quarterly Report released*. June 2019. <https://minister.environment.gov.au/taylor/news/2019/australias-national-greenhouse-gas-inventory-december-2018-quarterly-report> [accessed 19 August 2019].

include adopting a 'regulatory sandbox' approach. There is also an opportunity for the State Government to take the lead when it comes to planning for a transition to electric vehicles.

Removing regulatory barriers through regulatory sandbox arrangements

The State Government could adopt a regulatory sandbox approach when regulating and licencing projects with innovative technologies. Regulatory sandbox arrangements allow businesses to raise regulatory barriers with regulators and negotiate testing environments for technologies that are constrained by or outside of existing regulations.¹⁴

In the energy sector, it can lead to better services and lower costs for consumers.¹⁵ The Australian Energy Market Commission (AEMC) recently reported to the Council of Australian Governments (COAG) Energy Council on the use of regulatory sandbox arrangements in the national energy markets to better facilitate proof of concept trials.¹⁶

AEMC proposed three new tools in a regulatory sandbox toolkit to assist innovative trials including:

- an innovation enquiry service to provide guidance and help businesses get trials up and running quickly;
- a new regulatory waiver power for the Australian Energy Regulator (AER) so they can temporarily exempt trials from existing rules; and
- a new AEMC trial rule change process that can temporarily change existing rules.¹⁷

In the resources sector, technologies that would benefit from regulatory sandbox arrangements include carbon capture and storage or geo-sequestration (the process of trapping CO₂ in deep underground formations) and mineral carbonation (the process of transforming CO₂ emissions into products for use in building products such as cements and plasterboards or directly into mine waste and tailings storage facilities).¹⁸ This could be combined with continued government support to enable the development of carbon capture and storage expertise and capacity in WA.

¹⁴ NSW Government, 2019. *Innovation New South Wales, Regulatory Sandboxes*. Accessed here: <https://www.innovation.nsw.gov.au/regulatorysandboxes>

¹⁵ Australian Energy Market Commission, 2019. *AEMC recommends new regulatory sandbox to support innovation*. Accessed here: <https://www.aemc.gov.au/news-centre/media-releases/aemc-recommends-new-regulatory-sandbox-support-innovation>

¹⁶ Australian Energy Market Commission, 2019. *Regulatory sandbox arrangements to support proof-of-concept trials*. Accessed here: <https://www.aemc.gov.au/sites/default/files/2019-09/Regulatory%20sandbox%20toolkit%20-%20Final%20Report.pdf>

¹⁷ Australian Energy Market Commission, 2019. *Regulatory sandbox arrangements to support proof-of-concept trials*. Accessed here: <https://www.aemc.gov.au/sites/default/files/2019-09/Regulatory%20sandbox%20toolkit%20-%20Final%20Report.pdf>

¹⁸ Mineral Carbonation International, 2019. Accessed here: <https://www.mineralcarbonation.com/>

Preparing for a switch to electric vehicles

The State Government, through the Department of Finance, may be well placed to lead the transition by investigating the potential cost and suitability of switching the State Government fleet to electric vehicles. This type of study was undertaken by Synergy with FleetCarma earlier this year. The study found that switching Synergy's fleet to plug-in electric vehicles would potentially:

- Reduce the total cost of vehicle ownership by 26 per cent; and
- Reduce annual gasoline and diesel fuel consumption and related emissions by 72 per cent.¹⁹

Synergy has since completed similar studies with the City of Vincent and the City of Fremantle and is in the process of conducting studies with the Town of Cambridge and the City of Mandurah. Studies across government agencies and organisations could be used to build the business case for investing in electric vehicles.

¹⁹ Synergy, 2019. *Summary: Electric Vehicle Suitability Assessment* (unpublished)