



Curtin University

INSTITUTE FOR ENERGY
TRANSITION

Decarbonise WA

Summary of the decarbonisation
policy landscape in Western
Australia

Climate change, energy, industry and decarbonisation policy in Western Australia

The WA Government's Climate Adaptation Strategy (2023) recognises that WA is experiencing the impacts of climate change with heatwaves, bushfire risks, drying and extreme weather events. The WA Government has committed to achieving net zero emissions by 2050, with key priorities outlined in the Sectoral Emissions Reduction Strategy (2023). This includes to decarbonise the electricity sector, reduce industry and building emissions, decarbonise transport, reduce emissions from the agricultural sector and ensure a just transition for Aboriginal people, communities and the regions.

Projections indicate that significant reductions can occur from electrification of key industry sectors in the state that include, gas extraction, manufacturing, mining and chemical production (particularly fertiliser). These key industry sectors contribute approximately 50% of the state's emissions.¹ The unprecedented scale of change required to reach this target can be seen in Figure 1.

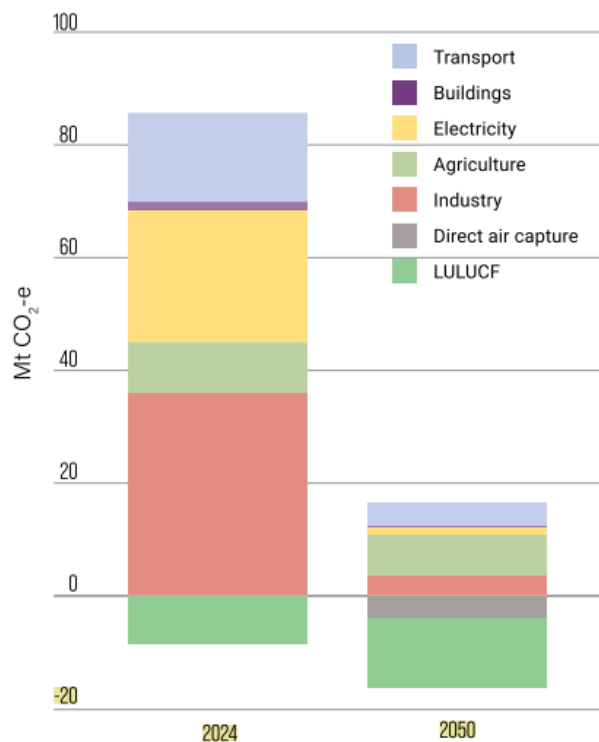


Figure 1. Source: SERS (2023, p.14) Modelled Western Australian emissions in 2024 and indicative net zero in 2050

Key themes across WA government policy

Analysis of seven key WA Government climate and industry policy documents² using NVIVO identified a number of key themes. The word cloud below illustrates the keywords that emerged from the initial analysis (Figure 2).

Owners in the Pilbara to protect cultural heritage and explore opportunities for benefits to be shared.⁷

7. Best practice engagement and collaboration were identified as being critical for ensuring Aboriginal communities and regional WA can realise benefits from state development plans while also being supported in climate adaptation efforts.

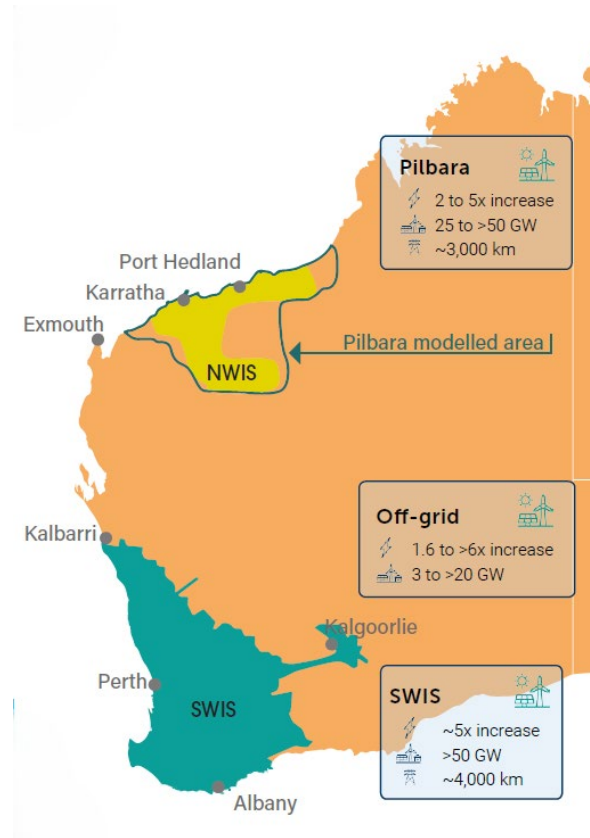


Figure 3. Source: DWER (2023). Electricity infrastructure growth in WA.

Significant investment in energy infrastructure is needed

Transforming the state’s electricity sector emerges as a key priority of government and industry to reach net zero. It is acknowledged by the WA Government that energy infrastructure will require an increased spatial footprint⁸, reinforcing that land access, and prioritising the needs and aspirations of Aboriginal and regional communities will be necessary to ensure benefit sharing.

Overall emissions on the SWIS are expected to decrease to 4Mt CO₂-e (from 10Mt CO₂-e) by 2030 to 2035. Emissions off grid and on the NWIS are also expected to decrease to 1Mt CO₂-e by 2035. This is based on the assumption that additional renewable energy capacity is added both on and off grid.⁹

With such significant state development, emission reductions are not guaranteed if renewable energy developments are not realised. Utilising data from seven hydrogen energy companies in Australia, empirical studies found that utilising fossil fuels to produce hydrogen has the

same impact as burning fossil fuels.¹⁰ To meet net zero, it will be important to ensure that hydrogen production occurs from renewable energy sources, rather than fossil fuels.

The WA Government have set up a Green Energy Approvals Directorate within the Department of Water and Environmental Regulation that aims to reduce approval times for “job creating green energy projects.”¹¹ However, there is a need to balance the significant urgency of renewable energy projects with coordinated planning across the state to protect environmental and cultural heritage, and to ensure community acceptance of projects. There is also a need for clear projections of the energy needs of industry, and new export markets to avoid speculative developments, which have the potential to create longer term impacts on the environmental, social, and cultural heritage of the state.

An objective of the Environmental Protection Authority (EPA) in WA is to reduce environmental harm due to climate change, by supporting the reduction of greenhouse gas emissions. The EPA have greenhouse gas guidelines in place to support project proponents to address the environmental impacts of renewable energy projects, such as land clearing, water quality impacts and waste management through the commissioning and decommissioning stages of projects.¹²

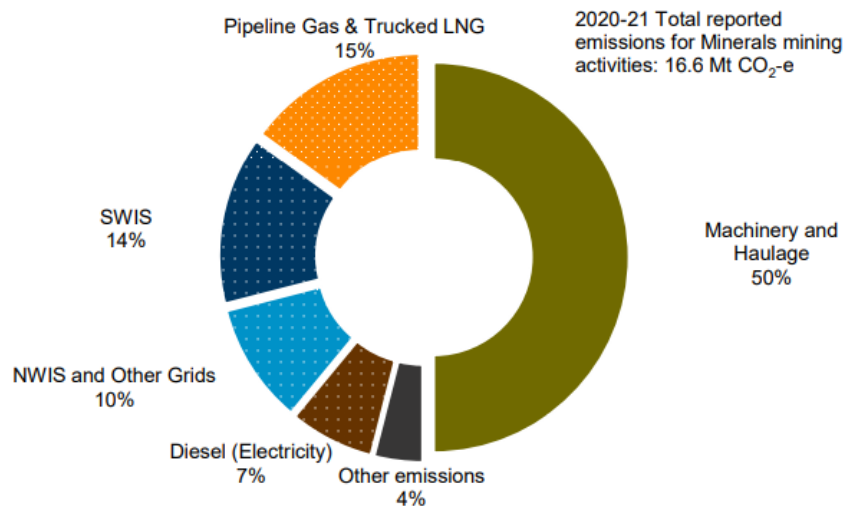
Household solar PV is a significant source of generation on the SWIS, which currently makes up approximately 2.5GW of generation capacity. Projections are that household solar will increase to 5GW capacity by 2035 on the Wholesale Electricity Market (WEM) constituting 23% of generation on the WEM by 2035.¹³ However, the level of household solar PV on the network, creates issues with voltage and frequency of the network. To manage solar PV on the network, the WA Government has introduced Emergency Solar Management to remotely turn off household solar PV (installed after February 2022) in emergency (minimum demand) situations.¹⁴

The WA Government has also invested in piloting Virtual Power Plants (VPPs) in the state to aggregate and orchestrate household consumer energy resources (CER). The most recent distributed energy resources (DER) roadmap notes several technical, social, policy and economic (value) recommendations to enable further aggregation and orchestration of CER in the state.¹⁵

Emissions from the mining sector

The Pilbara region contributes almost 40% of WA emissions. There are commitments from mining and energy companies to achieve net zero by 2050, with interim targets between 3–80% of scope 1 and 2 emission reductions by 2030 from several companies.

Data from 2021–2022 shows that the resource sector in WA is responsible for 49.1 Mt CO₂-e, which is more than half of the State’s greenhouse gas emissions (excluding land use, land use change and forestry). Nearly half of these emissions are from the electricity sector (SWIS, NWIS, pipeline gas & trucked LNG, diesel and other emissions). The remaining 50% of emissions are from machinery and haulage (Figure 4), and companies are also looking for ways to reduce these emissions.¹⁶



Most of the remaining emissions are from fuels used in trucks and other heavy mining equipment used onsite; companies are also looking at ways to reduce these emissions.

Figure 4: Source: WA Government (2022). Sources of WA minerals mining greenhouse gas emissions

Out of the 50% of emissions in the electricity sector, gold and iron ore mining account for around 86% of WA’s mining emissions with a small percentage for critical minerals (Figure 5). Remote, isolated mine operations contribute approximately 8% of total mine emissions as they are not connected to either the SWIS or the NWIS, and they rely mostly on diesel (79%), with a smaller percentage (19%) relying on trucked LNG for power generation.¹⁷

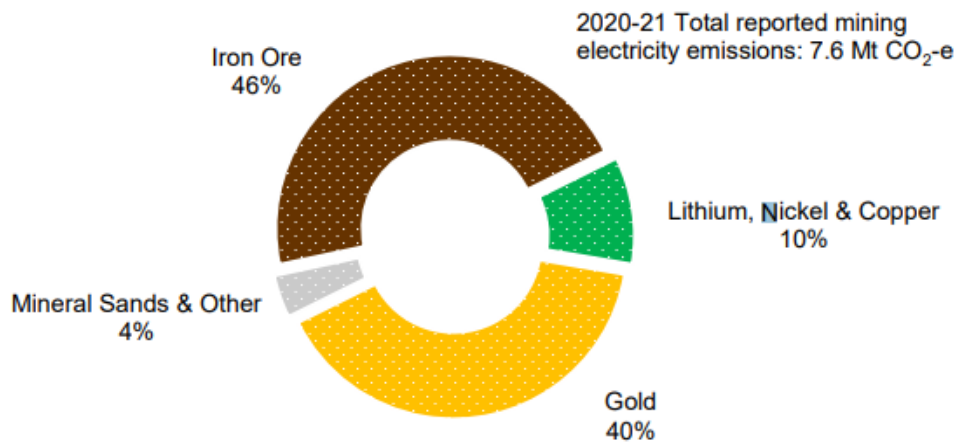


Figure 5. Source WA Government (2022). WA electricity emissions by primary material.

Growth in the mining sector is projected

Two key WA Government policies, the Battery and Critical Minerals Strategy 2024-2030, and the Renewable Hydrogen Strategy 2024-2030 provide a focus on investment in enabling infrastructure and project-ready land, workforce skills, research and development, advanced processing of critical minerals, environmental, social governance frameworks, and Aboriginal and community engagement and empowerment.

With the global demand for battery chemicals and other critical minerals, a key priority for WA is the development of advanced processing of critical minerals (midstream industries) and the use of industrial hubs to reduce the costs and risks of manufacturing while promoting innovation and synergies, such as by-product re-use. Common user infrastructure has been identified as a key enabler for this.

Another key priority is the production and export of renewable hydrogen products such as ammonia and green metals. The production of green steel is expected to reduce global emissions, but local processing is likely to increase emissions within WA¹⁸, thus posing immediate challenges for decarbonising WA.

Several policy documents identify the same key enablers to achieve the vision of growth set out in the policy documents. These include the need for:

- a skilled workforce
- environmental, social and governance frameworks
- a collaborative whole of government and industry approach for investment and trade¹⁹ (investment and trade ecosystem)
- advanced manufacturing capabilities
- key infrastructure
- project ready land
- policy and regulatory frameworks, and
- Aboriginal empowerment.²⁰

Endnotes

- ¹ Department of Water and Environmental Regulation (2023) Sectoral emissions reduction strategy for WA. p.7 & 19.
- ² DWER (2023) Climate adaptation strategy; DWER (2023) Sectoral Emissions Reduction Strategy; EPWA (2023) Southwest Interconnected System (SWIS) Demand Assessment; EPWA (2024) Distributed Energy Resources Roadmap – Third Progress Report; JTSI (2024) Battery and critical mineral strategy; JTSI (2024) Hydrogen strategy; Government of WA (2023) Diversify WA.
- ³ DWER (2023) Sectoral emissions reduction strategy for WA & EPWA (2023) Southwest Interconnected System (SWIS) Demand Assessment.
- ⁴ Energy Policy WA (2023) SWIS Demand Assessment 2023 – 2042. A future ready grid. Note: The SWISDA acknowledges that the Oakajee Strategic Industrial Area would contribute to significant load growth on the SWIS if realised.
- ⁵ Ibid, p.8
- ⁶ Government of WA (2023) Diversify WA. p.12 & 17
- ⁷ Energy Policy WA (2024) Traditional Owners and the Pilbara Energy Transition. <https://www.wa.gov.au/organisation/energy-policy-wa/traditional-owners-and-the-pilbara-energy-transition>
- ⁸ DWER (2023) Sectoral emissions reduction strategy for WA, p.19
- ⁹ Department of Climate Change, Energy, the Environment and Water (2023) Australia’s Emissions Projections 2023. <https://www.dcceew.gov.au/sites/default/files/documents/australias-emissions-projections-2023.pdf>. p.40.
- ¹⁰ Qadeer, A., Hussan, M.W., Aziz, G. *et al.* Emerging trends of green hydrogen and sustainable environment in the case of Australia. *Environ Sci Pollut Res* **30**, 115788–115804 (2023). <https://doi.org/10.1007/s11356-023-30560-2>
- ¹¹ WA Government (2024) Green Energy Approvals Initiative. <https://www.wa.gov.au/service/environment/green-energy-approvals-initiative>
- ¹² Environmental Protection Agency (2023) Annual Report 2023 – 24. [EPA Annual Report 2023-24.pdf.pdf](https://www.epa.gov.au/annual-report-2023-24)
- ¹³ Department of Climate Change, Energy, the Environment and Water (2023) Australia’s Emissions Projections 2023. <https://www.dcceew.gov.au/sites/default/files/documents/australias-emissions-projections-2023.pdf>. pp.40-41.
- ¹⁴ AEMO (no date) Emergency Solar Management. <https://aemo.com.au/initiatives/major-programs/wa-der-program/emergency-solar-management>
- ¹⁵ EPWA (2024) Distributed Energy Resources Roadmap – Third Progress Report.
- ¹⁶ Government of WA (2022) Fact Sheet. Western Australia minerals sector greenhouse gas emissions and energy use. <https://www.wa.gov.au/system/files/2022-08/EPWA.pdf>.
- ¹⁷ Ibid
- ¹⁸ DWER (2023) Sectoral emissions reduction strategy for WA, p.10
- ¹⁹ Government of WA (2022) Western Australian Investment and Trade Plan 2022 – 2024. https://www.wa.gov.au/system/files/2023-03/Western_Australian_Investment_and_Trade_Plan_2022-24.pdf
- ²⁰ JTSI (2024) Hydrogen strategy & Government of WA (2023) Diversify WA.