

SUBMISSION

Submission to the Economics and Industry Standing Committee

Submission to the inquiry into the role of Western Australia in the global effort on decarbonisation

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The Australian Academy of Technological Sciences and Engineering (ATSE) is a Learned Academy of independent, non-political experts helping Australians understand and use technology to solve complex problems. Bringing together Australia's leading thinkers in applied science, technology and engineering, ATSE provides impartial, practical and evidence-based advice on how to achieve sustainable solutions and advance prosperity.

Western Australia can support emissions reduction both nationally and globally by leveraging its abundant renewable energy resources and transitioning to green exports. This will require co-investment in infrastructure, exploration of emerging technologies, and building up the science, technology, engineering and mathematics (STEM) skilled workforce. ATSE recently released the report [*Decarbonisation Diesel Industries*](#) which looks at diesel decarbonisation of mining, freight and agriculture, fisheries and forestry in Australia. The report made recommendations to the Australian Government around removing barriers to adoption of low-emissions technologies in Australia's heavy industry and land freight and investing in R&D and early-stage deployment of low-emission technologies (ATSE, 2025a). In addition to the findings of that report, ATSE makes the following recommendations on Western Australia's role in global decarbonisation:

Recommendation 1: Invest in comprehensive infrastructure to support the clean energy transition including firmed renewable energy generation and shared transmission infrastructure.

Recommendation 2: Advocate for a review of the federal financial incentives supporting diesel use.

Recommendation 3: Conduct a review of the barriers to proposed renewable energy projects, considering simplification of approvals processes.

Recommendation 4: Leverage demand-side management technologies and policies to reduce electricity needs.

Recommendation 5: Support Western Australia's critical minerals industry to develop capabilities in value-added processing.

Recommendation 6: Ensure green exports align with international carbon certification schemes to help kickstart green export industries.

Recommendation 7: Consider the potential future role of carbon capture and storage to mitigate emissions from gas and hard-to-abate sectors, while exercising caution against over-reliance given the current lack of demonstrated long-term viability.

Recommendation 8: Expand ATSE's STELR program into more WA schools to build the future STEM-skilled workforce from the ground up.

Recommendation 9: Co-invest in delivering more Elevate scholarships for Western Australian women and non-binary people studying STEM degrees.

Recommendation 10: Facilitate cooperation between university and TAFE sector for upskilling via micro-credentials that are universally recognised.

Reducing emissions from diesel industries

Around one-third of heavy industry facilities regulated by the Safeguard Mechanism are based in Western Australia (WA Department of Water and Environmental Regulation, 2023). Decarbonising heavy industry and hard-to-abate sectors is vital to meeting both federal and state 2030 and 2050 emission reduction targets, and contributing to global efforts to decarbonise through participation in export markets.

ATSE's recent [*Decarbonisation Diesel Industries*](#) report highlights the need to accelerate renewable energy infrastructure to decarbonise, and review current diesel rebates. The report found that a significant barrier to low emissions technologies is cost and lack of infrastructure. Investment in charging infrastructure and firmed renewable power could enable electrification of diesel dependent sectors and investment in shared transition infrastructure could significantly reduce the cost of renewable electricity and support energy exports.

The report also found that the Fuel Tax Credit Scheme (FTCS) is a significant disincentive for diesel decarbonisation, as it allows the heavy industry sector to receive full or partial refunds on fuel excise paid on diesel. This hides the true cost of diesel fuel and contributes to the barriers preventing green alternatives being cost competitive. The Australian Government commissioning an independent review of existing financial incentives and support frameworks, such as the FTCS and other targeted financial support, could lead to reforms that accelerate the uptake of renewable fuel technologies and significantly reduce Australia's emissions. ATSE recommends that the Western Australian Government approaches the Australian Government to conduct such a review.

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Realising Western Australia's renewable energy advantage

As well as extensive solar and wind resources, Western Australia has land availability and ready infrastructure for exports. This puts the state in an excellent position to develop new energy intensive export industries, such as onshore processing of metal ores, the production of zero carbon chemicals, and provision of synthetic aviation and bunkering fuels. There is a significant opportunity to replace WA's fossil fuel exports with exports based on renewable energy such as green hydrogen, ammonia and sustainable aviation fuels (SAF). A Trilateral Hydrogen Hub Feasibility Study in May found that the state's mid-west could export locally produced green hydrogen and ammonia to Europe (Government of WA, 2025). In addition, the Western Green Energy Hub is a project which aims to produce up to 3.5 million tonnes per year of hydrogen and synthetic fuels, leveraging solar and wind resources (Australian Trade and Investment Commission, 2025). Western Australia has the potential to contribute to global decarbonisation by developing its renewable energy export industry.

Improving the speed of deployment for new green energy projects will accelerate decarbonisation and the time it takes for Western Australia to be part of the global renewable energy exports market. Delays to renewable energy project proposals can increase costs significantly which are ultimately passed on to consumers (ATSE, 2025c). In Western Australia, barriers to project approvals include long government approval process and community objections. It was estimated in 2023 that \$318 billion of investment was tied up in projects waiting for environmental approvals (Gilbert & Tobin, 2025). Bottlenecks in approvals for new green energy projects can create uncertainty, deter investment and delay WA's decarbonisation efforts. A comprehensive review of the barriers to proposed projects including regulatory frameworks, timelines for planning and community engagement could ensure that projects are being delivered more quickly and at a lower cost.

There are opportunities to leverage demand-side management to reduce Western Australian electricity needs, lowering emissions and consumer energy costs. For example, virtual power plants (VPPs) could provide energy security in the South West Interconnected System (SWIS) by coordinating the generation and consumption of energy from widely distributed sources (ATSE, 2025b). 40% of houses in the SWIS are equipped with rooftop solar panels, and as roof top solar increases, grid stability can be destabilised when there is lower operational demand (AEMO, 2025). VPPs can provide stability by aggregating distributed energy resources.

Recommendation 3: Conduct a review of the barriers to proposed renewable energy projects, considering simplification of approvals processes.

Recommendation 4: Leverage demand-side management technologies and policies to reduce electricity needs.

Expanding Western Australia's critical minerals industry

Western Australia's critical minerals sector presents a major opportunity to reduce emissions nationally and globally through exports. Western Australia supplies 38% of global iron ore (Minerals Research Institute of Western Australia, 2023). The state can capture greater value from this industry by expanding beyond raw mineral exports to processing and adding value, leveraging renewable energy and hydrogen. Opportunities include direct reduced iron (DRI) and green steel production. Hydrogen's potential for use in green steelmaking presents an opportunity for WA in both domestic use and export, but the cost of green hydrogen is currently high and could require investment in infrastructure and research and development to make it cost-effective (ATSE, 2025a). There are opportunities for state and federal government support to develop the minerals processing industry in Western Australia. The Australian Government's industrial

policy, Future Made in Australia, already supports development of hydrogen and minerals processing through production tax credits. To leverage Western Australia's competitive advantages alongside this federal support, the Western Australian Government can provide additional support through targeted grants for facilities as well as leadership on carbon certification schemes.

Alignment with overseas carbon certification will be crucial for accessing and maintaining export markets. In 2023, the European Union (EU) adopted the implementation of a Carbon Border Adjustment Mechanism (CBAM) which applies to goods such as iron, steel and hydrogen (De Orte Julvez, 2023). Other countries, such as the UK and Canada, are in the process of developing similar emissions trading systems (Bonnet & Barsauskaite, 2025). Western Australia can capitalise on a first-mover advantage by rapidly decarbonising exports, however if decarbonisation of exports is delayed, this could result in competitive disadvantages.

Recommendation 5: Support Western Australia's critical minerals industry to develop capabilities in value-added processing.

Recommendation 6: Ensure green exports align with international carbon certification schemes to help kickstart green export industries.

Exploring the role of carbon capture and storage

Western Australia is a major international supplier of liquefied natural gas (LNG). Natural gas is used as a lower-emissions alternative, particularly for peaking power, to balance the variability of renewable energy, enabling the deployment of an increasing proportion of renewables in the energy networks. In addition to power generation, LNG can be used in blue hydrogen production, which can also be used in green steel production. Green hydrogen is likely to outcompete blue hydrogen due to costs in the medium to long term and has stronger emissions reduction potential (White et al., 2023), however blue hydrogen could be suitable in the short to medium term as the state's existing gas infrastructure gives it the ability to scale up production quickly.

Carbon capture and storage (CCS) is currently being used to offset emissions from natural gas in blue hydrogen production as well as emissions from hard-to-abate sectors such as heavy industry in Western Australia. In the transition to green steelmaking for example, conventional steelmaking uses machinery that has a long-life span, so decarbonisation means either retiring the machinery early or using CCS to reduce onsite emissions (Minerals Research Institute of Western Australia, 2023). While CCS could have potential to remove emissions, particularly in hard-to-abate industries, Australia only has one facility operating at scale with a limited number of successful and long-term operations (Geoscience Australia, 2024). Further technological advancements will be needed to make CCS scalable and economically viable. In planning for new facilities, caution is urged in accounting for CCS to reliably reduce onsite emissions, given these technological and economic challenges.

Recommendation 7: Consider the potential future role of carbon capture and storage to mitigate emissions from gas and hard-to-abate sectors, while exercising caution against over-reliance given the current lack of demonstrated long-term viability.

Boosting the renewable energy skilled workforce

In the coming years, there will be workforce gaps in renewable energy generation industries in solar, wind, transmission and storage for green fuel production as is the globally. It is projected that Western Australia's workforce in the electricity sector could triple by 2031, particularly if there is significant industrial growth in hydrogen and ammonia (Langdon et al., 2025). A significant proportion of jobs produced from new renewable energy projects are expected to be in regional and remote areas. ATSE urges a whole-of-lifecycle approach to boost STEM skills, beginning from the earliest levels of education, to deliver the skilled workforce needed for the energy transition.

At a school level, ATSE's [STELR](#) program pairs engaging hands-on classroom resources with teacher curriculum materials, linking the science curriculum to sustainable engineering and energy principles. STELR supports out-of-field teachers in STEM classrooms, empowering them through a community of practice and peer support. In Western Australia, there are 71 schools participating in the STELR program – representing about 6% of Western Australian schools. Expanding this into more schools would expose more

students to STEM concepts and careers, and support teachers to confidently deliver hands-on STEM education.

At a tertiary education level, focusing on attracting and retaining historically underrepresented cohorts (such as women) to STEM disciplines can be a lever for increasing the size of the STEM-skilled workforce. Targeted programs such as ATSE's [Elevate: Boosting Diversity in STEM](#) can be used to support priority areas and reduce inequities in access to education. Elevate provides comprehensive scholarships and wrap-around support for up to 500 undergraduate and postgraduate women and non-binary people studying STEM degrees. Elevate currently has 39 participating scholars in Western Australia. State government and industry co-investment would increase the number of Western Australian scholars benefitting from this program, who will go on to become part of the STEM-skilled workforce.

Upskilling, including through vocational training and microcredentials, can enable established professionals (including displaced workers) to transition their careers into the clean energy sector. Australia's National Microcredentials Framework provides credit recognition guidelines to ensure consistency in recognition across the tertiary education sector (Department of Education, 2024). This framework could be leveraged in a consortium between WA's universities and TAFEs. With a potential merging of WA universities currently under review by the state government, WA has an opportunity to build closer integration with vocational education providers into the merged university. This would support student mobility between vocational and higher education and enable more people to access short form credentials to support rapid career transitions.

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ATSE thanks the Parliament of Western Australia's Legislative Assembly Economics and Industry Standing Committee for the opportunity to respond to the inquiry into the role of Western Australia in the global effort on decarbonisation. For further information, please contact academypolicyteam@atse.org.au.

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