

SUBMISSION

Submission to the Tasmanian Department of State Growth

Submission to the Advanced Technologies Industry Strategy

31 January 2025

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.

Science and technology are vital to Tasmania's economy, people and environment. The development of an Advanced Technology Industries Strategy will help to make the most of the outsized impact of Tasmania's research and development sector by catalysing the transformation of breakthroughs into real world applications that benefit Tasmanians and build the state's economic resilience. Establishing a strong advanced technology industry sector will require strengthening Tasmania's approach to research, development and commercialisation. It will be necessary to centralise coordination and invest in key enablers – innovation hubs, a skilled workforce and critical infrastructure. These investments will have multiplier benefits across the state's economy and local community.

ATSE recommends the following actions to develop Tasmania's advanced technology industries:

Recommendation 1: Appoint a Tasmanian Chief Scientist or establish an independent advisory Tasmanian Science and Technology Council to help support and coordinate research activities across government, industry and academic.

Recommendation 2: Work with the University of Tasmania to develop best practice frameworks to reduce administrative burdens for establishing and growing successful industry and government collaborations.

Recommendation 3: Establish innovation hubs for identified priority research areas that co-locate industry and academic researchers to accelerate development.

Recommendation 4: Improve digital connectivity and reliability in regional areas to support greater remote work and study options.

Recommendation 5: Invest in critical research infrastructure at innovation hubs and the University of Tasmania.

Recommendation 6: Actively recruit specialist teachers into the Tasmanian education system, and provide greater support and professional development to out-of-field teachers.

Better utilising Tasmania's strengths through a central office

Below is a summary of four core areas where Tasmania holds natural and competitive advantages in research and development, and that are likely to have a strong impact on the local economy.

Research priority area	Activity location (examples)	Research hubs in Tasmania
Forestry	Permanent timber production zone land	Australian Research Council Centre for Forest Value at the University of Tasmania
Mining & Critical Minerals	Extraction: Rosebery, Renison, Queenstown, Savage River, Corrina Processing: Port Latta, Burnie, Bell Bay, Risdon	Centre for Ore Deposit and Earth Sciences at the University of Tasmania
Agriculture and Aquaculture	Agriculture: Mersey-Lyell region, Huon Valley, Coal River Valley Aquaculture: Macquarie Harbour, Huon River	Tasmanian Institute of Agriculture at the University of Tasmania CSIRO Institute for Marine and Antarctic Studies at The University of Tasmania
Antarctic and Southern Ocean	Macquarie Point (planned), Macquarie Island	Institute for Marine and Antarctic Studies at the University of Tasmania CSIRO

These represent Tasmania's best opportunities to establish thriving advanced technology industries. For example, aging equipment in the mining sector will see a need for significant technological upgrades, including increased use of data-based AI technology for mineral exploration, remote and autonomous

vehicles, improved sorting through artificial intelligence and improved sensors. Agriculture is similarly likely to be increasing reliant on improved sensing technologies to monitor soil quality and plant and animal health, while Hobart's status as the gateway to Antarctica will also make Tasmania an ideal hub for autonomous ocean vessels.

To ensure that Tasmania is on the forefront of research and development in its existing areas of strength and opportunity, central coordination is required. Tasmania is the only state in Australia to not have a Chief or Lead Scientist to support the state government in connecting with, learning from, and securing its research, development and innovation sectors. The recent [Western Australian 10-Year Science and Technology Plan](#) has gone a step further, by establishing a Science and Technology Council to further support their Chief Scientist as they implement the plan. ATSE strongly encourages Tasmania to establish a Chief Scientist and/or independent Science and Technology Council, supported by appropriate resourcing in the Department of State Growth, to provide evidence-based advice to decision-makers, and take a strategic coordination role in guiding priority areas. ATSE is willing to assist the Tasmanian Government to establish this body.

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Improving collaboration and talent transfer between government, industry and academia.

Increasing collaboration and integration of advanced technology industries and researchers is a target across the nation. Greater coordination and collaboration between industry, government and academia increases the opportunities for research to be applied, adopted and improved. For example, the Centre for Ore Deposit and Earth Sciences (CODES) at the University of Tasmania places students and early career researchers on site with industry partners, building connections that provide researchers with industry insights and investment, and giving industry access to relevant world-class research and the next generation of skilled workers (CODES 2023). ATSE Fellows have noted that similar planned collaborations have been delayed significantly by administrative hurdles, such as intellectual property agreements. Working with the University of Tasmania to develop and incentivise frameworks for collaboration with industry and government may help to reduce these administrative hurdles and make beneficial R&D collaborations more accessible.

Typically, industry-academia collaborations are built on existing relationships and the movement of skilled researchers and professionals between industry, government and academia. Co-locating industry and researchers in related fields can assist to both build vital industry connections that support commercialisation, support a two-way flow of ideas and skilled personnel between industry, government and academia, and reduce costs for all participants (PwC Australia 2019). This co-location needs to be targeted, bringing together similar interests so that collaboration can flourish. This can be achieved by establishing innovation hubs around themes or challenges relevant to the state priorities – possibly centred around a theme relevant Cooperative Research Centre (CRC), with critical infrastructure supported by the Tasmanian Government. Innovation hubs can also link start-ups with established industry players, helping them to establish their business, by helping start-ups to find potential markets and capital investment.

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Recommendation 3: Establish innovation hubs for identified priority research areas that co-locate industry and academic researchers to accelerate development

Improving Tasmania's technology capacity and connectivity

Internet connections have become the lifeblood of commerce, learning and research. Despite this, Tasmanian industries, researchers and students contend with unstable, slow internet connections – particularly in regional areas, as highlighted by Minister for Community Services the Hon. Roger Jaensch

(Jaensch 2024). Internet access and speeds will only become more critical as large multinationals (particularly in the technology sector) increase their remote workforce. With stable and high-speed internet connections, Tasmania will be well placed to attract and support these highly skilled remote workers with an enviable lifestyle. Investing in connectivity will also help to facilitate data sharing and productivity improvements for Tasmanian industries and researchers, while enabling greater distance education to help support the development of a future advanced technology workforce.

A co-location strategy for innovation hubs to bring together these future advanced technology workers will require an investment in shared infrastructure and specialised equipment to help facilitate industry investment in a research hub. While the exact infrastructure and equipment needed will depend heavily on the mission or theme of the hub, it is likely that investments in advanced measurement tools (e.g. crystallography, proton nuclear magnetic resonance and liquid-chromatography-mass spectrometry equipment) will be needed. This kind of imaging equipment can cost over \$1 million per machine¹, making it inaccessible for small-to-medium enterprise, start-ups and many research teams. Co-locating with industry allows for the costs of such equipment to be split multiple ways or recovered from usage fees, reducing the long-term costs of these investments.

Beyond innovation hubs, investment in infrastructure critical for research, education and business is essential to improving Tasmania's advanced technology industries. University of Tasmania Vice Chancellor Professor Rufus Black has acknowledged that there is an urgent need for improved science, technology, engineering and mathematics (STEM) facilities in southern Tasmania (Langenberg 5 November 2024). While plans for improvements are ongoing and upgrades have been made to facilities in Launceston (see: Infrastructure Australia 2019) government support for these facilities is likely to be needed if they are to be operational this decade.

Recommendation 4: Improve digital connectivity and reliability in regional areas to support greater remote work and study options.

Recommendation 5: Invest in critical research infrastructure at innovation hubs and the University of Tasmania.

Building a STEM skilled workforce

An expansion of Tasmania's advanced technology industry will require a highly skilled workforce to support these industries and drive their growth. Some of these skilled professionals can be attracted from elsewhere, but investing in Tasmania's own workforce will be vital to build the state's long-term capacity, capability and resilience. Engaging and inspiring students with new technologies like artificial intelligence and machine learning, as well as the basic practical skills and advanced trade skills needed to build Tasmania's advanced technology workforce.

Building the skilled workforce must start in Tasmanian schools. Tasmania consistently scores below the national average on measures of STEM education performance, with only 42% of Tasmanians reaching the National Proficient Standard in mathematics and only 51% reaching the standard in science – the lowest in the country (Willie 2023). Tasmania's NAPLAN numeracy scores in 2024 were lower at every year level than every other state and territory except the Northern Territory (ACARA 2024).

ATSE's [Our STEM Skilled Future – An education roadmap for an innovative workforce](#) report highlights many of the ways STEM education and training can be improved across the country. Of particular importance is working to employ enough teachers with a background in the STEM subject they teach. Out-of-field teaching may have negative impacts on student performance and subject confidence (Porsch and Whannell 2019) and occurs more regularly in regional and low socio-economic areas, compounding disadvantage. Out-of-field teaching should be avoided wherever possible. Where unavoidable, additional support and resources for the teacher can be the difference in building teacher and student capability and confidence. Investing in STEM resources for schools, particularly in areas that enable students to see the real-world applications of STEM principles, can also help to encourage the development next generation of STEM skilled workers. ATSE has a long history of supporting STEM education through our [STELR program](#), that supports more than 1000 schools and learning centres – including 49 in Tasmania – to get accessible, curriculum-linked hands-on learning about engineering principles with real world impact. ATSE

¹ Depending on machine and the exact specifications required.

looks forward to working with the Tasmanian Government to expand and improve support for STEM education across the state.

Recommendation 6: Actively recruit specialist teachers into the Tasmanian education system, and provide greater support and professional development to out-of-field teachers.

ATSE thanks the Department of State Growth for the opportunity to respond to the Advanced Technology Industries Strategy. For further information, please contact academypolicyteam@atse.org.au.

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