SUBMISSION

Submission to the Queensland Department of Environment, Tourism, Science and Innovation

Submission to Queensland's Science and Innovation Strategy

31 March 2026

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.

Queensland has an opportunity to build a science and innovation system that is not only globally competitive, but uniquely suited to the state's geography, industries and communities. ATSE envisions that the central goal of Queensland's Science and Innovation Strategy is to develop a distributed innovation system that drives productivity across the whole state. The state has a natural advantage in its primary industries, resources and tourism which can be leveraged to strengthen its economy, expand job opportunities and contribute to carbon emissions reduction (ATSE, 2025a). The 2032 Olympic and Paralympic Games could be used as a catalyst to enhance, showcase and attract global investment in innovation in sustainability, resilience and regional inclusion.

The state has an appetite to grow the talent and diversity of its Science Technology, Engineering and Mathematics (STEM) workforce, expand research infrastructure in relevant areas, increase partnerships across sectors, support research translation and commercialisation, uplift digital and AI and empower community awareness and engagement with science (Queensland Government, 2024). This submission builds upon ATSE's Boosting Australia's Innovation report, which presents recommendations to improve Australia's innovation ecosystem, drawing from roundtables with over 150 senior representatives across industry, academia and the public sector. Many of these recommendations are highly relevant to Queensland's Science and Innovation strategy and can be implemented without significant additional research and development (R&D) investment (ATSE, 2025b).

ATSE makes the following recommendations for Queensland's Science and Innovation Plan:

Recommendation 1: Recognise quantum technology as a priority emerging technology in the strategy.

Recommendation 2: Use government procurement policies to encourage commercialisation of locally developed innovations, prioritising Queensland's priority deep technology sectors including health and biotechnology, quantum technology and batteries and critical minerals.

Recommendation 3: Support the development of infrastructure for advanced and digital technologies including regional AI factories in Queensland.

Recommendation 4: Invest in digital and research infrastructure in South East Queensland and regional areas to support collaboration and research translation and commercialisation links state-wide.

Recommendation 5: Strengthen industry collaboration in universities by supporting proven programs such as the IMNIS: Industry Mentoring Network in STEM program.

Recommendation 6: Prioritise elevating Aboriginal and Torres Strait Islander peoples and the application of Traditional Knowledge to innovation.

Recommendation 7: Integrate priority areas such as engineering, digital and AI into school curriculums through delivery or support of proven programs.

Recommendation 8: Address the workforce gap through delivery or support of proven programs that could expand Queensland's STEM workforce.

Supporting research commercialisation

Queensland is globally competitive in biomedical technology, primary industries, digital and AI, and mining equipment, technology and services (METS) (Queensland Government, 2025). The state is endowed with significant reserves of the critical minerals that underpin the global energy transition, including vanadium, cobalt, graphite, manganese and rare-earth elements, as well as the extractive industry expertise and physical infrastructure needed to develop them. This positions Queensland to capture value not just from raw mineral extraction but also from downstream processing, battery materials manufacturing, and energy storage system development. The state also has a world-class biomedical sector which brings in $361 million from private manufacturing and R&D investment each year (Queensland Government, 2025), as well as an advanced digital technologies sector that includes artificial intelligence (AI) and quantum technologies. Queensland is home to internationally recognised quantum computing and quantum sensing research capability, anchored at the University of Queensland and supported by significant federal and state investment through the Australian Research Council's Centres of Excellence program. Quantum technology

represents a generational opportunity: quantum computing has the potential to transform optimisation problems in logistics, resources scheduling, drug discovery and financial modelling, while quantum sensing offers transformative applications in precision agriculture, subsurface resources mapping and navigation. A 15-year science and innovation strategy is the appropriate horizon for building Queensland's quantum advantage.

The Queensland Government has a critical role as a first customer and demand-side driver, particularly through procurement to create early demand for Queensland-developed technologies. Demand-side signals are often more powerful than grants alone, helping validate products and attract investment and scale into national and global markets. Governments can create a market and drive private-sector adoption of Australian inventions by acting as early adopters and purchasing innovative goods and services (ATSE, 2025b). This includes continuing to support and leverage the Queensland Venture Capital Development Fund (VCDF). The VCDF delivers accelerator programs that expand the pool of investment-ready businesses in Queensland, thereby increasing investment opportunities for venture capital investors in innovative early-stage Queensland companies. Committing a proportion of this procurement to Queensland-developed solutions would validate local innovations, attract private co-investment and create a replicable model for other states. Priority should be given to technologies where the state has strong capability such as health and medical technology, advanced and digital technology, and critical minerals. ATSE's Boosting Australia's Innovation report identified this demand-side mechanism as one of the most powerful and underutilised levers available to state governments (ATSE, 2025b).

Queensland's priority industries face a mix of technical, regulatory, and scale-up barriers that slow or prevent commercialisation. Autonomous machinery, robotics and AI-enabled decision tools require large-scale, real-world testing which is difficult without coordinated demonstration farms. ATSE's recent report Unleashing growth: Australia's AI Investment Blueprint identifies how regional AI factories could enable commercialisation and growth of start-ups. Regional AI factories are collaboration hubs for universities, industry, investors, start-ups and the public that can support commercial application and broader uptake through compute capacity, training and capital (ATSE, 2025c). The report recommends the develop of up to seven of these facilities in Australia and as a leader in digital and AI, Queensland could home one of these facilities as part of a network across the country. Regional AI factories will be an important enabler for Australia's AI capability and strategy.

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Enhancing collaboration between industry and academia

Queensland is a highly dispersed state, and small industry clusters and distance from investors creates structural barriers to innovation. Challenges such as access to capital and fragmented commercialisation pathways are amplified in regional settings where operating costs can be higher and markets are sparser. Queensland currently has innovation precincts focused on research translation and commercialisation of agricultural technology and immersive technologies (Advance Queensland, 2026). There is opportunity to go further and expand research infrastructure to Queensland's globally competitive sectors such as critical minerals, biotechnology and health technology, in addition to the commercialisation facilities that already exist. Queensland currently lacks the dedicated cell and gene therapy manufacturing infrastructure and the bioprocess scale-up facilities needed to enable locally developed biomedical innovations to reach clinical and commercial stages without relocating offshore. Investment in this infrastructure that is co-located with existing research strengths at the Herston Health Precinct and the Translational Research Institute would strengthen Queensland's position as a destination for global biomedical investment and create high-value jobs in the life sciences. Investment in digital and research infrastructure in regional areas would further enable Queensland's globally competitive sectors. There is a role for the state government in developing this infrastructure to leverage and strengthen Queensland's existing research strengths. The $280 million

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Translational Science Hub, a partnership between the Queensland Government, Sanofi, the University of Queensland and Griffith University, demonstrates the potential to anchor global pharmaceutical investment in Queensland's research institutions. The $280 million Translational Science Hub, a partnership between the Queensland Government, Sanofi, the University of Queensland and Griffith University, demonstrates the potential to anchor global pharmaceutical investment in Queensland's research institutions.

Industry and academia collaboration can be strengthened by increasing the awareness of early-career researchers to opportunities in industry and research translation and commercialisation. ATSE's IMNIS: Industry Mentoring Network in STEM program is equipping Australia's STEM workforce to drive innovation and cross-collaboration between industry and academia by connecting PhD students and early career researchers with industry leaders to develop industry skills and knowledge. In 2025, four universities and research institutes participated in the IMNIS program, providing industry mentorship to around 60 early-career researchers and fostering collaboration. ATSE's IMNIS program has demonstrated the value of connecting early-career biomedical researchers with industry leaders. Expanding IMNIS specifically within Queensland's health technology and medical devices sector would accelerate the pipeline of researchers with the skills and networks needed to drive commercialisation.

There is an opportunity to develop genuine partnerships with Aboriginal and Torres Strait Islander people in Queensland and incorporate Traditional Knowledge into the state's science and innovation. Around 29% of Queensland's land area is Native Title land claims or determinations (Eddie et al., 2021). Traditional Knowledge systems offer deep expertise in environmental stewardship, particularly in agriculture and aquiculture. There is opportunity to drive innovation in agriculture and increase workforce opportunities through translation of Traditional Knowledge (ATSE, 2025a). Genuine partnerships with Traditional Owners can strengthen research outcomes, improve social licence and support participation in the STEM workforce. At a national level, these opportunities have been highlighted by ATSE's annual Traditional Knowledge Innovation Award. Past winners include Associate Professor Azure Hermes for her work on culturally safe genomics, and John Watson and Professor Ron Quinn AM FTSE for their development of a pain treatment based on Traditional Knowledge. A role of the Queensland Science and Innovation Strategy could be to signal the opportunity and importance of research in partnership with Traditional Knowledge holders.

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Boosting STEM workforce capability

Addressing the state's STEM skills gap requires a whole-of-lifecycle approach that considers the earliest level of education all the way through to tertiary education and mid-career transition. Integrating disciplines such as engineering and technology into the curriculum is crucial to developing skills that will enable students to pursue careers in priority industries. 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 teachers, including out-of-field teachers, to deliver engaging STEM education, empowering them through a community of practice and peer support. In Queensland, there are 174 schools participating in the STELR program – representing about 10% of schools in the state. Programs like STELR are proven programs that expose more students to STEM concepts and careers, and support teachers to confidently deliver hands-on STEM education, and there is opportunity for the state government to expand its impact in Queensland, or deliver programs based on it.

At a tertiary education level, focusing on attracting and retaining historically underrepresented cohorts 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 show how programs can be designed and run to

support priority areas and reduce inequities in access to education. Elevate provides comprehensive scholarships and wrap-around support for undergraduate and postgraduate women and non-binary people studying STEM degrees. The program has provided almost 500 scholarships to date, with 8% of scholarships awarded to Aboriginal and Torres Strait Islander people and 41% awarded to women and non-binary people from regional, rural and remote areas. Elevate has awarded 148 scholarships to women and non-binary people in Queensland since 2023. This program has been federally funded, however with state government co-investment there is an opportunity for it to be expanded to address state priorities.

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ATSE thanks the Queensland Department of Environment, Tourism, Science and Innovation for the opportunity to respond to Queensland's Science and Innovation Strategy. For further information please contact academypolicyteam@atse.org.au.

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