SUBMISSION

Submission to Jobs and Skills Australia

Submission to the Jobs and Skills Roadmap for Regional Australia

2 October 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.

Regional Australia supports key industries such as agriculture, mining, manufacturing and renewable energy, which underpin the country's food security, resource sector and energy production. However, regional Australia faces persistent challenges in education, workforce, digital connectivity and equitable access to employment opportunities. Key groups of people face barriers to training and workforce participation, including women, Aboriginal and Torres Strait Islander people and migrant workers. Strengthening education and training pathways, removing structural barriers and investing in programs that enable learning and workforce participation across marginalised groups can increase regional resilience and capability. Rapid technological, social and environmental change will shape the future of jobs in regional Australia, and science, technology, engineering and mathematics (STEM) skills will be critical to transforming the regional workforce. ATSE welcomes Jobs and Skills Australia's proposed Regional Roadmap and suggests expanding its focus on STEM skills to enable regional Australians to participate in in-demand STEM professions.

ATSE makes the following recommendations:

Recommendation 1: Expand access to STEM education in regional Australia, with early exposure at school level and stronger promotion of pathways into clean energy and critical industries.

Recommendation 2: Support critical STEM disciplines at regional universities by covering the full cost of STEM courses and increasing microcredential offerings.

Recommendation 3: Expand programs that support women in regional Australia to access STEM education to increase representation in STEM disciplines, including engineering.

Recommendation 4: Expand and support First Nations-led STEM education initiatives to improve participation and employment outcomes.

Recommendation 5: Improve recognition of overseas qualifications and align skilled migrant assessments with local employer needs to reduce underemployment and support faster workforce integration in regional Australia.

Recommendation 6: Support connectivity in rural, regional and remote areas, including through the Better Connectivity Plan for Regional and Rural Australia.

Supporting STEM education to strengthen regional industries and workforce pathways

STEM education is crucial to regional Australia. Key industries, including mining, agriculture, water management and manufacturing, are all heavily reliant on STEM skills. The need for STEM skills will increase with the transition to a decarbonised economy. Australia will need an additional 85,000 workers by 2030 to support the construction, operation, and maintenance of renewable energy infrastructure, with at least 51% of these workers in national shortage occupations, including engineers, electricians and plant operators (Monaghan 2024).

Despite current and future demand for skills, many regional STEM education offerings are dwindling. This shortage is particularly evident when looking at earth sciences, including geoscience and geophysics. Earth science courses are being cut across Australia, particularly at rural universities. As of 2021, less than 50% of Australia's universities offered degrees in geoscience, and in the past few years, Macquarie University and the University of Newcastle have closed their earth science departments (Rogan 2024). These decisions suggest universities are having to prioritise short-term financial considerations over the national importance of these disciplines. The courses are expensive to deliver, usually requiring extensive field work and frequently do not get the student numbers necessary to make the courses economically sustainable. Negative perceptions of the mining industry and a lack of awareness of the importance of earth sciences are further deterring enrolments (Rogan 2024). Engineering is another key profession facing current and projected workforce shortages. Australia's engineering demand has consistently outpaced the supply of graduates, growing at three times the rate of the general workforce between 2016 and 2021 (Briggs 2023). This is impacted by a lack of understanding of the opportunities present for engineering graduates and outdated stereotypes of the discipline (Engineers Australia 2025).

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Investment into regional workforce training for STEM disciplines could help these communities to benefit from future clean energy projects, including offshore wind farms, solar farms and battery energy storage systems (Clean Energy Council 2023), as well as in other key sectors such as agriculture. Early exposure to STEM education, particularly in earth science and disciplines relevant to the energy transition, including engineering, can make STEM more attainable for students and shift perceptions of critical disciplines at an early age. STEM career opportunities can be highlighted through experiential learning and resource provision in primary and secondary STEM curriculum, including through programs such as ATSE's STELR, which offers more than 20 curriculum modules comprising over 280 lessons and 100 hands-on activities, including in renewable energy technologies. Other programs include the Teacher Earth Science Education Program (TESEP), which is an online resource that facilitates student learning and teaching support and aims to raise awareness of geoscience and geophysics, while providing better resources for teachers.

Increased funding to support pathways for university and vocational education would support an increased supply of skilled workers. Foundational micro-credentials, including in geoscience, geophysics and mining, can enhance STEM education at regional and rural universities. Partnerships with organisations such as the Minerals Council of Australia can assist in amplifying and expanding current investments in funded courses offered in metropolitan areas to regional universities, including microcredentials for the foundations of modern mining. Programs such as ATSE's Elevate: Boosting Diversity in STEM aim to address gender inequities through delivering scholarships, access to events and networking, mentoring and support to women studying STEM degrees. A more inclusive STEM education system will not only support gender equity in the workforce but will also address critical skill shortages in many STEM fields by increasing the number of skilled job-ready graduates. Increased support for university courses would also support the availability of STEM-skilled workers. The Job-Ready Graduates Program, implemented in 2021, resulted in a reduction of the revenue received by universities for STEM courses. This created an indirect incentive for universities to promote fields that have higher tuition fees, rather than STEM fields (Norton 2022). Restoring government investment to cover the full cost of undergraduate and postgraduate STEM degrees, such as geology, geophysics, geochemistry, environmental sciences and engineering, is recommended to encourage STEM uptake and incentivise universities to promote STEM offerings, including in regional areas. These actions would assist in the draft Regional Roadmap's proposed principle of 'Developing Skills', ultimately improving indicators such as tertiary participation and skills utilisation.

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Ensuring equitable access to skills, training and employment opportunities in regional Australia

Regional Australia continues to face persistent gaps in attracting and retaining skilled workers across underrepresented groups. Women in regional Australia face significant barriers to full workforce participation (Hutchinson et al. 2023). Women in regional Australia are more likely to work part-time or casually and are underrepresented in leadership roles (Workplace Gender Equality Agency 2025). They are also less represented in higher-paid industries, including in STEM, limiting the ability of regional industries to access diverse talent. Participation of women in engineering is particularly stark, making up only 16% of the engineering workforce. A lack of awareness about engineering as a viable career option is noted as a common reason for low representation (Briggs 2023). Support for organisations, programs and apprenticeships that encourage women to enter STEM in regional Australia, including engineering, is recommended. ATSE's Elevate: Boosting Diversity in STEM program is well placed to support women in STEM education through scholarships, mentoring and support, and extending the program would enable more women to benefit. Establishing a regionally specific program like the Women in STEM Cadetships and Advanced Apprenticeships program offered by the Department of Education could assist in increasing the participation of women and STEM workforce numbers.

Aboriginal and Torres Strait Islander communities also face barriers to acquiring jobs and skills. The workforce participation rate of Aboriginal and Torres Strait Islander people in regional Australia was 53.96% in 2021, compared to 60.81% in metropolitan areas (Hutchinson et al. 2023). Aboriginal and Torres Strait Islander people

are also underrepresented in STEM educational attainment, with only 0.5% having a University STEM qualification compared to 5% of non-Aboriginal and Torres Strait Islander adults (Leigh et al. 2020). Training programs delivered on country have been seen to increase skills in Aboriginal and Torres Strait Islander communities, increasing community engagement and the employability of participants (Hutchinson et al. 2023). Programs need to be co-designed and developed with Aboriginal and Torres Strait Islander communities and organisations to target workforce and skill shortages and to facilitate self-determination in employment outcomes, supporting the roadmap's objective of supporting local place-based strategies. First Nations-led initiatives, such as Deadly Science, which offers several programs to increase Aboriginal and Torres Strait Islander STEM participation in schools, can increase awareness and accessibility of STEM resources and education.

Migrants make a significant contribution to regional economies and are essential to mitigating Australia's STEM workforce shortages. Skilled migrants make up nearly 60% of Australia's engineering workforce and contributed to 70% of its growth from 2016 to 2021 (Romanis 2021; Briggs 2023). While many migrants arrive with significant qualifications and professional experience, their skills are often underutilised due to a lack of information and difficulties in gaining recognition of overseas qualifications. Many migrants remain underemployed or employed below their qualification levels for years after arrival, including in engineering (Sadler 2025; Romanis 2021). While some support services exist, many migrant engineers still face barriers to entering the Australian workforce, including not knowing what services are available. There are opportunities to improve the efficient matching of labour supply and demand and migrant accreditation processes, as proposed by the draft Regional Roadmap. Support programs for migrants can be improved, including the provision of credible, trusted information for migrants, and the encouragement of local employers to hire migrant engineers, as proposed by Engineers Australia (Romanis 2021). Such programs could assist migrants in gaining local experience and reputation in Australia. Skill assessments of migrants and ease of obtaining local credentials can be further supported through government initiatives and increased information sharing between state and federal governments (Romanis 2021; Joint Standing Committee on Migration 2006). Alignment between the initial assessment of skilled migrants by the Australian government and the expectations of local employers is needed, as current processes often do not translate smoothly (Tan and Cebulla 2023). Further consideration of current offshore skills assessments in migration processes with onshore skill requirements may help reduce barriers to employment, including for migrant engineers.

Recommendation 3: Expand programs that support women in regional Australia to access STEM education to increase representation in STEM disciplines, including engineering.

Recommendation 4: Expand and support First Nations-led STEM education initiatives to improve participation and employment outcomes.

Recommendation 5: Improve recognition of overseas qualifications and align skilled migrant assessments with local employer needs to reduce underemployment and support faster workforce integration in regional Australia.

Improving digital infrastructure to support resilient and connected regional communities

Reliable and fast internet connectivity for regional Australia provides significant benefits, such as telehealth facilities, remote education offerings and communication in extreme weather events. Lack of digital connectivity is identified in the draft Regional Roadmap as a barrier, but actions to address this are not proposed in the current version. Uplifting digital connectivity will be an enabler for regional Australia to access education and workforce opportunities under the Regional Roadmap. The current telecommunications infrastructure offers limited and unreliable connectivity to large regions of Australia. Between July 2021 and June 2024, the Telecommunications Industry Ombudsman received over 50,000 phone and internet complaints from consumers living in regional, rural and remote Australia. These complaints included reports of faults, poor service quality, poor mobile service coverage, outages and accessibility barriers (Telecommunications Industry Ombudsman 2024). The need for digital connectivity is increasing, as innovative technologies are already beginning to underpin Australia's regional economy in agriculture, mining and manufacturing. Increasing telecommunications coverage would also have significant economic benefits beyond jobs and skills. For instance, artificial intelligence is being increasingly used for monitoring, data analysis, marketing, security, and trade, while Internet of Things (IoT) devices can provide Australian farmers with real-time data on their water and power usage, crop growth, livestock, maintenance alerts and changing market prices (Agrifutures Australia 2024; Wu et al. 2019).

The $1.1 billion Better Connectivity Plan for Regional and Rural Australia has improved mobile and broadband connectivity and resilience, but is currently only a five-year program. The digital infrastructure required to keep regional Australia in line with technological developments will require long-term investment in new infrastructure, maintenance and supporting digital literacy initiatives. Continued funding for the Better Connectivity Plan for Regional and Rural Australia would help regional Australia to remain adequately connected in the face of changing connectivity challenges. In addition to infrastructure provision, device access and skill development can also be improved through projects funded by the plan. The 'triple-crown' approach that addresses network, device and skill provision has been seen to build digital literacy internationally (Robinson et al. 2020). An increase in programs that support digital literacy skills and digital access, in addition to physical infrastructure, can help bridge the digital inclusion gap between metropolitan and regional areas (Thomas et al. 2023).

Recommendation 6: Support connectivity in rural, regional and remote areas, including through the Better Connectivity Plan for Regional and Rural Australia.

ATSE thanks Jobs and Skills Australia for the opportunity to respond to the Jobs and Skills Roadmap for Regional Australia. For further information, please contact academypolicyteam@atse.org.au.

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