

2022 Federal Election Position Statement

Achieving a technology-powered, human-driven future

The coming decade will see the culmination of a unique set of challenges: decarbonisation of our economy, managing the transition of industries, anticipating an increasingly uncertain global environment, training the workforce needed for new industries and, simultaneously, an increasingly digital future.

Australia faces multiple challenges. The pandemic and geopolitical events have exposed vulnerabilities in our supply chains and economy. Our way of life is under threat from climate change and climate-induced disasters such as the Black Summer and recent floods.

Our country has a unique opportunity to position itself as a technological powerhouse driven by a carbon neutral and sustainable economy, a highly skilled workforce and world-class research activity and commercialisation. **ATSE believes that scientific and technological advances must be nurtured and translated into novel innovations to achieve this aspiration of a *technology-powered, human-driven future*.**

In the lead up to the 2022 Federal Election and beyond, ATSE calls on all political parties to commit to a future which is:

- **Technology enabled:** The development and industrial implementation of new technologies is essential to facilitate a future of economic growth and high standards of living.
- **Resilient:** There must be sufficient resources and adaptability to tackle the challenges of the future, including natural disasters, the impacts of climate change, geopolitical uncertainty, and cyberattacks, through new and emerging technologies and retraining displaced workers in the decarbonising economy with future-focused digital skills.
- **Sustainable:** Environmental, social, and economic sustainability are critical to enable a high quality of life for Australians into the future. This must include the development of sovereign manufacturing capabilities and a transition to a circular economy.
- **Decarbonised:** As natural resources deplete and the effects of climate change proliferate, it is crucial for industrial and economic activities to be carbon neutral. Australia has a unique opportunity to lead in repositioning its current resource dependent economy into a carbon neutral economy based on renewable energy and other new and emerging technologies for a sustainable future.
- **Diversified economically:** Shifting economic activities toward multiple sources from multiple sectors, expanding domestic markets (within a circular economy) and exports are necessary to embed resilience into the economy.
- **Internationally engaged:** The most pressing challenges of our time are global, and their solutions require international conversations and collaborations to be effective and Australia needs to take a leadership position in these discussions.
- **Human centred:** Principally, this vision must be human centred and driven. Economic activity and scientific and technological advancement are enablers to deliver progress that serves all our people and the planet.

These 7 principles are aspirational and should underpin the long-term policies and investments which are needed to realise a technology powered, human driven future. However, to shift the needle in the immediate term, ATSE has identified three national policy priorities and recommendations to fast-track this future:

- Mitigate and adapt to climate change
- Enhance research collaboration, translation, and commercialisation
- Reverse declines in student participation in science, technology, engineering, mathematics (STEM) disciplines to create a STEM-equipped workforce

Mitigate and Adapt to Climate Change

While the COVID-19 pandemic has presented a challenge to Australia and the world, climate change will result in more dramatic and long-term disruptions. Australian's have faced this challenge for decades and is worsening. The black summer bushfires, droughts, and the 2022 floods are manifestations of our changing climate. Technology can offer solutions to mitigate its worst impacts and adapt to a warming world.

The most pressing concern for Australia and the world is to limit climate change to below 1.5 degrees Celsius. This requires a shift in the way we power our homes and industry, transport people and goods, grow our food and fibre, and manage waste. Thankfully this is the area where Australia's natural resources, from critical minerals to renewable energy sources, provides us with opportunities to make this transition while helping other countries to do the same. For example, we can power our homes with renewable energy and use it to produce green hydrogen for export to other countries.

We need infrastructure that is resilient to withstand not only the current climate but also the increasingly severe and frequent extreme weather events in the future.

To limit, mitigate and adapt to climate change ATSE calls on all political parties to:

- Commit to the immediate deployment of existing mature, low-carbon technologies which can make deep cuts to high-emitting sectors before 2030
- Create a national strategy that will shift all vehicles and machinery to electric or hydrogen power sources
- Create and fund a research strategy to help deliver the emerging technologies that are needed to deliver the final 20% emissions reductions needed to meet our net zero target by 2050
- Develops a plan which that does not eliminate any potential clean energy solution through legislative ban unless there is compelling evidence of health dangers and environmental costs

Enhance Research Collaboration, Translation and Commercialisation

The commercialisation of Australian research into new technologies is essential in a technology powered, human driven future. These technologies are needed to monitor weather in real time, to predict floods and their effect on infrastructure, to decrease waste, and create the new markets needed for a more diverse carbon-neutral economy.

But for Australia to be successful in the commercialisation and translation of research into innovation we need a long-term plan. The gap from quantum theory to quantum computers is not a 3-year endeavour but a 77-year one from quantum theory to the first quantum computer (and that doesn't even include translation to a commercial product). Nor is translation a STEM only process, as we have seen during the pandemic. Having a vaccine is not enough; we need to understand the societal pressures that discourage people from taking these vaccines.

To effectively utilise Australian research for the good of all ATSE calls on all political parties to develop a national long-term comprehensive strategy, which must:

- Include research and development from blue-sky (or basic) to blue chip, including an increase to national research funding to at least 3% of the GDP over the next 5 years, and
- Contain a plan to deliver a workforce with the skills and research capabilities required for the future economy.

A strong STEM equipped workforce

The need for a STEM equipped workforce is well established. The COVID-19 pandemic has shown us the fragility of Australia's STEM-skilled workforce and its reliance on skilled immigration. It is expected that by 2025 Australia will have a shortfall of 40,000 engineers (excluding software engineers)¹. These are the engineers that will be needed to build the technologies to enable Australia to address the future challenges discussed above.

The entire Australian workforce needs digital skills to engage with future technologies. It's not only STEM professionals that need to be equipped with the skills needed for a technology powered future. Technological innovation is going to touch every area of the economy whether it is legal briefings written with the aid of artificial intelligence, or real time remote sensing and treatment of crops.

To build this workforce ATSE calls on all political parties to deliver:

- A national plan to address the dire shortage of STEM teachers in our schools, especially in our regions
- A national strategy to address the STEM professional shortages (through [IMNIS](#) type mentoring and industry engagement programs)
- A plan to make digital skills part of the national curriculum for all students (through programs like [STELR](#) and [CS in Schools](#))
- A plan for supporting workers affected by a changing economy and to help them change careers

¹ Group of 8 2021, 'Go8 Industry Summit: Securing the Future of Australia's Engineering Workforce'.