

COMMITTEE FOR GREATER HOBART

The future of STEM in Tasmania

Forum report, December 2024



We acknowledge and pay respect to the Tasmanian Aboriginal community as the traditional and original owners and continuing custodians of this land.



About the Committee

The Committee for Greater Hobart is a member-funded, independent and apolitical organisation working with the Greater Hobart community to create a better future for all.

As part of this work, we hosted a forum on 19 August 2024 to discuss the future of Science, Technology, Engineering and Mathematics (STEM) in the state.

The Committee will continue to facilitate discussion between our members and key stakeholders regarding opportunities for Tasmanians, particularly our young people, to engage in STEM; as well as ensure STEM education challenges and opportunities are highlighted in the Independent Review into the Tasmanian Education System.

Foreword

As an island state close to the southernmost point of the world, Tasmania is rich in innovation and opportunity. Our proximity to the Southern Ocean and Antarctica position us as a place of global and national research significance. We are home to the Australian Antarctic Division, and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) has a significant presence on the Hobart waterfront, where its research vessel *RV Investigator* also has its home port.

The University of Tasmania is nationally and internationally recognised for its research and the positive contributions it makes in maritime, marine and Antarctic studies; medicine, health and wellbeing; aquaculture and agriculture; climate and renewable energy.

The state has a long and rich history of creativity and innovation – from boat building to food and wine to information technology and engineering.



Image credit: Jess Oakenfull

In a rapidly changing world, Tasmania needs to hone in on these skills, draw on its deep history and forge a path ahead that keeps us at the forefront of what we do best.

By harnessing the power of what makes us unique, and channeling our energy into building a better future for generations to come, we can enjoy living, working, studying and playing in one of the most beautiful places on Earth.

What does our future look like?



Recent projections from the Department of Treasury and Finance's TasPOPP 2024 Final Report show that while Tasmania's population will continue to grow in the next 30 years, it will also rapidly age. By 2053 the report projects the number of people aged over 65 in Tasmania will increase by 52%, while those aged 15-64 will increase only minimally, and those aged under 14 will actually decline.

Our young people are leaving, and those that stay behind face the challenges of housing affordability, cost of living pressures and an education system that is significantly failing our primary and secondary school age students.

Economist Saul Eslake's independent review into state's finances, released in August 2024, found that Tasmania remains Australia's poorest state, measured by per capita gross product, and in 2022-23 the gap widened to the biggest margin in 32 years.

'We are the poorest state in the nation because fewer of us have jobs, we work fewer hours and for each hour that we work we produce less'

- Tasmanian economist Saul Eslake

What does our future look like?

Tasmania's productivity rate is 20% below the national average, but we know that productivity growth is the key driver of real wage growth and raising living standards over the long term.

Multiple studies highlight the correlation between science, technology, engineering and mathematics (STEM) skills and productivity, with one European study showing that every 1 percentage point increase in the share of high-skilled STEM workers generates a productivity gain of around 2%.

Given Tasmania's position at the forefront of STEM-related research and industries, we see it as vital that the strengthening the state's STEM work force is a major focus to boost our future productivity.



Renewable Energy

- Tasmania's ***Green Hydrogen Hub*** is projected to inject $1.2B into the economy and generate 700+ jobs in engineering, project management and technical roles.
- ***Project Marinus*** and
- ***Battery of the Nation*** will also require growth in these skilled professions.



Agriculture

- The State Government's target to grow the farm-gate value of the Tasmanian *agriculture sector to $10B by 2050* will require a skilled workforce with capabilities in STEM and new technologies - including automation, remote sensing and drones.

What does our future look like?

It is estimated that a 1% increase in the STEM workforce would generate a $1.2B increase in Tasmanian Gross State Product (GSP) over the next 20 years. A stronger STEM workforce is also linked to higher Gross Domestic Product (GDP), GDP per capita, employment, and research and development expenditures.

But where will these workers come from? National averages of STEM Bachelors degree attainment are concerningly low, and in Tasmania these rates are even lower. Enrolments in pre-tertiary STEM school subjects are declining. In 2023, less than half of the 1,100 maths teachers in Tasmanian schools had specialist mathematics qualifications. And only two- thirds of science teachers were specialists.

The state's work force, both public and private, is struggling to attract skilled and STEM-qualified workers, with many reporting that Tasmania is losing the battle as a preferred destination for national and international migration.



Tasmania's current workforce is lacking in technology skills

Deloitte research suggests 3 in 5 businesses do not have skills for emerging technologies, costing ~$51M per year in lost output.



Most industries will need more general technology skills

An estimated 270,000+ Tasmanian workers in multiple sectors will need upskilling to keep up with new technologies.



And more qualified workers with specialist IT skills

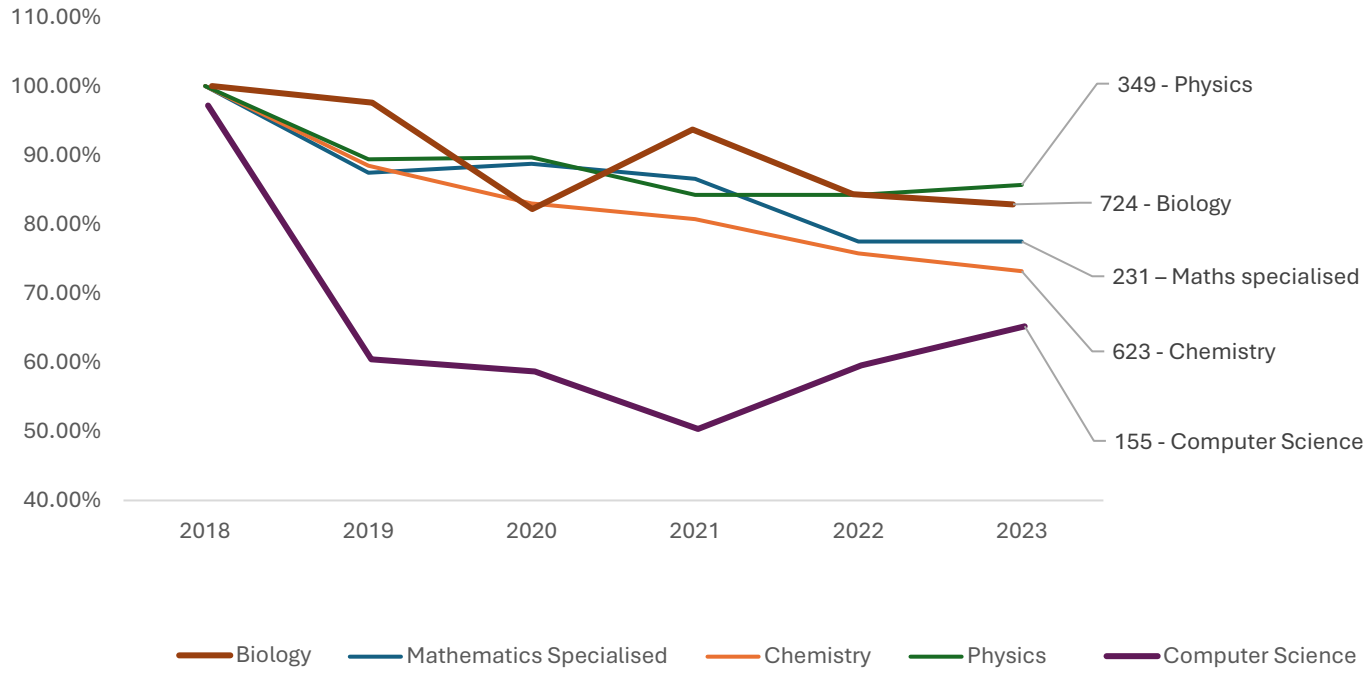
Deloitte estimates an extra 3,000 University or VET qualified technology and IT workers will be needed in Tasmania by 2030.

Source: Deloitte 2023 Report: Australia's Digital Pulse, Tasmania edition.

What does our future look like?

Educating the STEM workforce we need for the future will continue to be challenging, with declining enrolment rates in pre-tertiary STEM school subjects.

Percent change in enrolments in selected pre-tertiary STEM subjects (2018 as baseline) Tasmania, 2018 - 2023



TASC Course Scaling Data, 2018 – 2023, Figures are indexed to 2018 levels; absolute enrolment numbers for 2023 shown beside the class title

What is our opportunity?

"I am Tasmanian, I've grown up here, gone to university here. For me, it was a relatively easy decision. I was always interested in science and maths at school, so going into engineering, I did look at options to go interstate as well as here, but I felt that based on my own personal circumstances, UTAS had what I wanted to do.

"And with me, I found that during university, one of the really good things and beneficial things that we did was placement. Obviously at university, you get a good theoretical understanding but you don't get a good idea of what it is like to be in the industry at all.

"I ended up getting to spend two summers working with GHD, and that was I think hugely beneficial.

"In terms of challenges, sometimes for a woman in engineering, that can be a bit of a challenge, because you are such a minority, and there still exists some prejudices you come across occasionally. I think it is starting to get better, but yes there still exists in some people that opinion."



Rebecca Green, centre, with her GHD colleagues Leon Rawson, left, and Mark Trusselle at our Future of STEM in Tasmania forum.

Rebecca Green

Transport Engineer, GHD



Image credit: Alastair Bett

What is our opportunity?

"An island state with a relatively small population is an excellent place to do population research, and not only for analysing data.

"We're all connected here, so we can do things that wouldn't be possible in bigger centres. The community likes to be involved in the research, and since we all know one another in health care and health research we can work together on things and share.

"Tasmania, per capita, has more strokes than elsewhere in Australia. We're a place-based university. The research we're doing and the things we're really good at should improve the lives of the people of Tasmania."

Associate Professor Seana Gall

Senior Research Fellow

Menzies Institute for Medical Research

What is our opportunity?

The beauty of underwater Tasmania, and its mysteries, led Joanna Smart to one of the most special places on the planet to study marine life and environments – and that place just happened to be right where she grew up. She graduated from University of Tasmania with a Bachelor of Marine and Antarctic Science with first-class honours.

"People often said to me, 'there's no jobs in marine science'," she said. This was discouraging but also entirely untrue. Today, Joanna is part of a growing community of people who share her passions and obsessions. "Tasmania has one of the highest percentages of marine scientists of anywhere on Earth and the industry ranges from Antarctica to salmon."

"For me, a goal for the future is to help Tasmanians see that what we have underwater is more than a resource. Our underwater environment has more value than what we can take from it: variety, beauty, and life."

Joanna Smart

Marine scientist and photographer



Image credit: Alastair Bett

What is our opportunity?

"The Planning Institute of Australia (PIA) is leading a PlanTech strategy that is looking to how it supports education of planners that equips them with the skills to adopt new technology, systems and approaches to work, particularly in a period of rapid technological change.

While most planning systems now include digital elements, it hasn't yet experienced the transformation evident in other sectors. Using digital planning infrastructure is now and will continue to be an important part of the planning task for cities.

How well planning systems embrace this is variable. There is already significant advancement in other jurisdictions across Australia. For example, Victoria now utilises a digital twin in modelling development outcomes. Unfortunately, we are already behind without even a centralised database providing up to date information about the city. We rely on new studies and analysis every time we want to do strategic planning.

Digital platforms also potentially offer real-time comprehensive tracking of built environment development activity, enabling deeper timelier knowledge of urban processes to guide agile decisions. This is a major potential gain from PlanTech.



Incoming Planning Institute of Australia President Emma Riley

It is with lots of enthusiasm that I now get to be part of a conversation about creating a place of opportunity. Improving educational outcomes for Tasmania, particularly in STEM, is a foundational step in getting to that place."

What is our opportunity?

“At times the state is isolated, but the way we do things in the business is typically pretty different from the norm, at least in software industry. So in some ways, that separation does have its positives. Staying here certainly hasn't been the easiest path, but for us, for the founders, James and Lan, we like it here.”

Michael Shaw, CTO, Procreate



What is our opportunity?



“Creating that ecosystem between different employers is really important. Government has a role to play in that, as does industry and institutions like education.

So it definitely does need a concerted approach from all sectors to do their bit to really encourage the growth of the STEM student pipeline and jobs.

Otherwise we're going to find ourselves, I think, in 10 years’ time saying, ‘Well, you just don't do STEM in Tasmania’.”

Russell Kelly, CEO, TasICT

What is our opportunity?

Hobart is an Antarctic Gateway City, one of only five around the world.

Growing up in Devonport in Tasmania's North-West, Alex Fraser's community looked in the opposite direction to Antarctica – north across Bass Strait to the bright lights and big cities.

But Alex chose to travel south to study a combined degree in Computing and Science at the University of Tasmania – and has never looked back.

"UTAS, IMAS and the Australian Antarctic Program Partnership (AAPP) have really been at the forefront of Antarctic fast ice studies. We see it as a missing piece of the puzzle in climate projections."

"It sounds really clichéd, but you feel like you're making a difference in the world. You're reducing uncertainties in future climate projections. It gives you the warm fuzzies."

Alex Fraser

Remote Sensing Specialist



Image credit: Jon Gazzignato

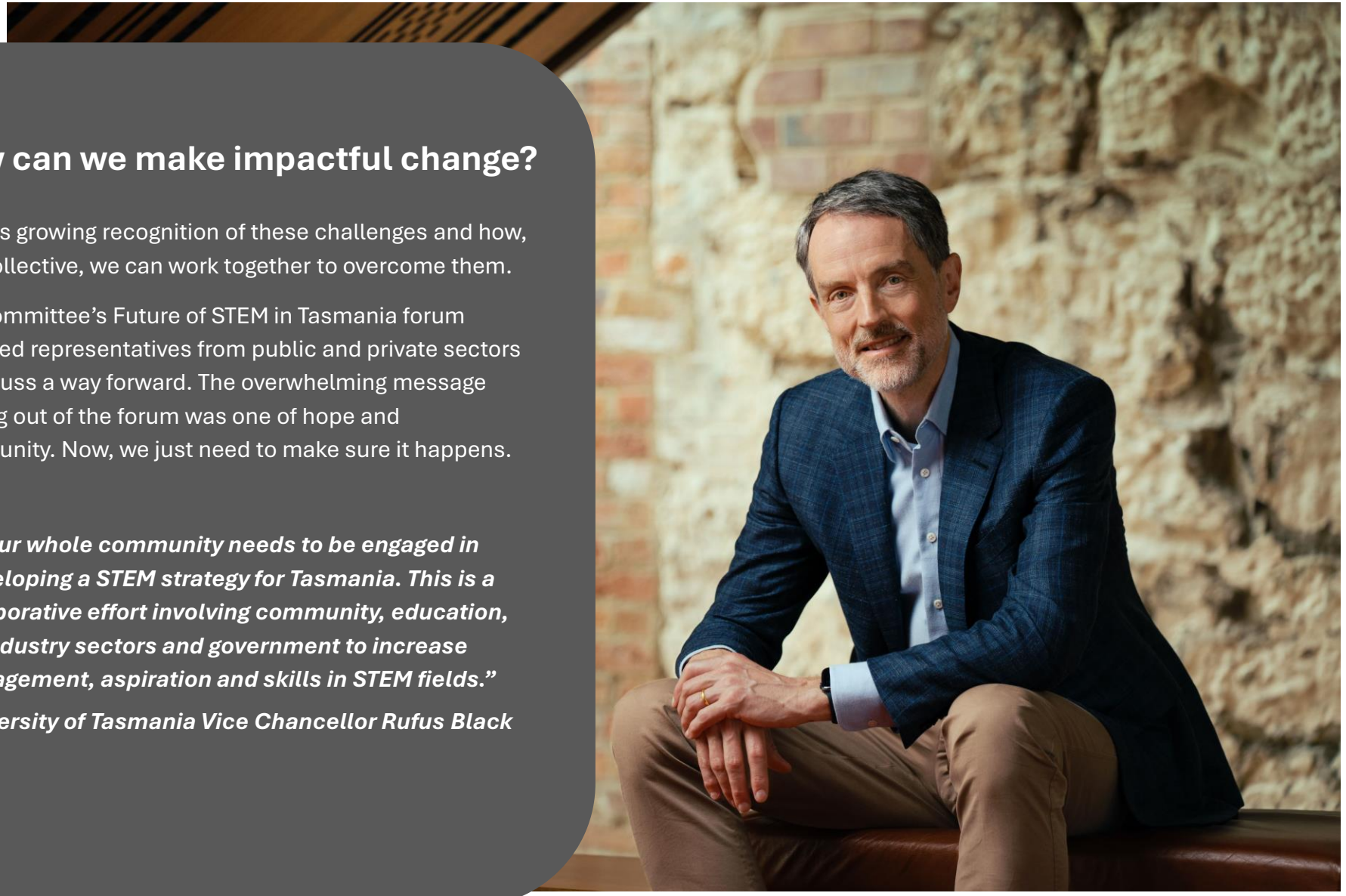
How can we make impactful change?

There is growing recognition of these challenges and how, as a collective, we can work together to overcome them.

The Committee's Future of STEM in Tasmania forum attracted representatives from public and private sectors to discuss a way forward. The overwhelming message coming out of the forum was one of hope and opportunity. Now, we just need to make sure it happens.

"Our whole community needs to be engaged in developing a STEM strategy for Tasmania. This is a collaborative effort involving community, education, industry sectors and government to increase engagement, aspiration and skills in STEM fields."

- University of Tasmania Vice Chancellor Rufus Black



What does success look like?

“A few things: STEM is cool in school, it's a thing people want to really be involved in. People in our community use it every day – using digital services for all that they do. And in cafes, people are actually talking about cool STEM stuff that's happening in and around around the city, because Hobart's a magnet for the particular things we do well here, with STEM, that are cool.”

- Rufus Black, Vice Chancellor, UTAS

Well for me, the key word is aspiration. If you change the way Tasmanians use technology, you change Tasmania. And giving this sense that it's through STEM, through imagining a better world. It's about self improvement. It's about wanting to be involved in these cutting edge and inspiring subjects.

- Russell Kelly, CEO, TasICT

From an engineering perspective, it's probably a strong pipeline of people who have an understanding of what engineering is and are enthusiastic about it.

- Rebecca Green, Transport Engineer, GHD

What if half of our workforce could be Tasmanians as we expand? We're at a third or a quarter at the moment, but it's not increasing as the business does.

- Michael Shaw, CTO, Procreate