



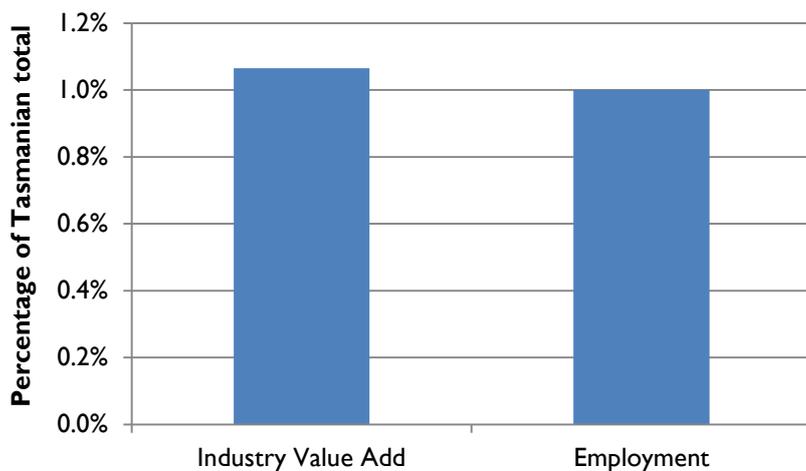
Science research

The trade and investment sectors contained in the sector summary series have been compiled from Australian and New Zealand Standard Industry Classification (ANZSIC) classes using a value chain approach. This means that industry classes from ANZSIC have been grouped together to provide estimates of the size of the particular trade and investment sectors.

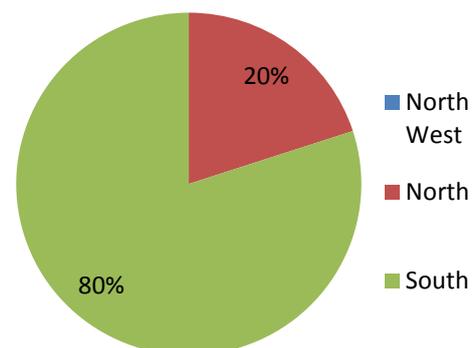
Coverage: Science research activities, predominantly those of publically-funded research organisations, including University of Tasmania (UTAS) (including the Menzies Research Institute and the Institute for Marine and Antarctic Studies), the Antarctic Climate and Ecosystems Cooperative Research Centre (ACE-CRC), the Australian Antarctic Division (AAD) and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Marine and Atmospheric Research (CMAR) division.

Key indicators

Science research



Regional employment



Key statistics at a glance

Indicator	Units	Period	Data	Change from five years ago	Per cent of Tasmania	Per cent of Australia
Industry value add ^(a, b)	\$M	2011-12	\$242	NA	1.1%	NA
Employment ^(a)	No.	2011-12	2 096	NA	1.0%	NA
Incomes (average weekly) ^(c)	\$	2011-12	\$2 138	NA	174.9%	NA

(a) *Wells Economic Analysis* (2013). Excludes private sector science research and Antarctic and Southern Ocean (featured in a separate sector summary)

(b) Industry Value Add is a component of Gross State Product and measures the total value of goods and services produced by the sector less the value of inputs.

(c) *2011 ABS Census*. This includes employment and non-employment related income (e.g. rents, dividends, interest, child support and government pensions and allowances). A percentage above 100 per cent of average weekly income suggests workers in this industry earn higher than the average wage.

Summary of sector

Tasmania is home to a vibrant and diverse science research community. The state's natural advantages of proximity to Antarctica and the Southern Ocean (ASO), geographical isolation, abundant water and wind resources and a stable population have resulted in expertise in a number of scientific areas: ASO and marine sciences, climate change, ICT, oceanography, system modelling, biological (including biodiversity and plant) sciences, food safety/microbiology, radioastronomy, population genetics, maritime engineering, agricultural and veterinary sciences, fisheries, and chemical, physical and earth sciences. A critical mass of renowned researchers in all these fields has been built up, predominantly in Hobart.

The three main employers in the science research sector in Tasmania are UTAS, the AAD¹ and the CSIRO through its Marine and Atmospheric Research Division (CMAR), and the Tasmanian CSIRO ICT Centre (TCICT).

Tasmanian public science research institutions directly contributed \$331 million in 2011-12 to Gross State Product (GSP). These institutions spent \$598 million in Tasmania in 2011-12 on things such as wages and purchasing Tasmanian goods and services². The Tasmanian public science research institutions employed 2 850 highly-skilled people in 2011-12, similar to the mining or forest product industries. A further 450 PhD students undertake their studies in Tasmania in the sciences and over 50 per cent of these are internationally based. The average incomes of these highly paid and skilled people is \$112 700 per year, or about 60 per cent higher than the Tasmanian private sector and 30 per cent higher than the Tasmanian public sector generally.

The flow-on effects from spending by Tasmanian public science research institutions creates further jobs in the state. Every million spent generates additional economic output of up to \$2.1 million. An extra employee generates up to 1.9 jobs elsewhere in the Tasmanian economy.

Tasmania's research sector is globally-recognised as world-leading in a number of disciplines. Results from the Excellence in Research Australia (ERA) assessment show UTAS ranks as 'well above world standard' in analytical chemistry, oceanography and horticultural production. Furthermore, UTAS' performance in the physical, astronomical and space, chemical, clinical, agricultural and veterinary, fisheries, earth sciences and inorganic chemistry, geology, plant biology and animal production disciplines are all ranked 'above world standard'. The Menzies Research Institute and the Institute for Marine and Antarctic Studies are also carrying out world-class research that is relevant both locally and internationally. These institutes have both received large infrastructure investments in recent years and have continued to grow in size and reputation since their establishment. Furthermore, in 2013, the ACE-CRC received funding to continue its world-class research for another five years.

The state has a record of attracting internationally-recognised research staff and collaborative programs to Tasmania. In addition, Tasmanian science research provides tangible benefits for many Tasmanian-based industries. These include aquaculture, agriculture, forestry, mining and biomedicine, as well as various service-based initiatives.

¹ Antarctic and Southern Ocean activities (including science research and logistic support components) are the subject of a separate sector summary, although the recent Wells Economic Consulting (see below) survey includes analyses of the wider Tasmanian science research sector. Public institution science research activities and expenditure alone are addressed here.

² Surveys conducted in 2013 for the then Department of Economic Development, Tourism and the Arts of spending in the Antarctic public science sector and the wider public sector science sector in Tasmania in 2011-12, by Blacklow Economic Consulting and Wells Economic Consulting respectively, and an approximation of the spending on science research activities by the Tasmanian State Service.

Consultation with industry stakeholders identified the following key constraints and opportunities:

Constraints/risks

- Obtaining secure, ongoing funding for science research.
- Loss of a key Tasmanian-based research program or institution.
- Building Tasmanian, home-grown research skills and knowledge.
- Attracting and retaining highly-skilled researchers in priority targeted areas.
- Access to internationally-competitive research infrastructure.

Opportunities

- Attracting increased investment from the Australian Government and private sector to establish new research programs, collaborations or institutions.
- Expanding existing programs or institutions by leveraging existing institutions and capabilities.
- Attracting and facilitating new investment in research infrastructure.
- Facilitating industry uptake of research outcomes and encouraging broader innovation in industry.
- Improving Tasmania's national and international reputation as a creative centre of research excellence and a knowledge-based economy.
- Building skills within the Tasmanian science research sector to improve investment attraction and science communication skills.
- Attracting Tasmanian students to careers in science research and talented national and international students to study at the University of Tasmania.

Strategy summary

Reaching our potential: developing Tasmania's science research capability

In late 2012, the science research sector development strategy, *Reaching our Potential: developing Tasmania's science research capability*³ was released. This had been developed in close collaboration with a Science Research Advisory Committee, which included representatives from all Tasmania's key public science research institutions. Based on research and analysis presented in a background document, the strategy's action plan features three key projects 1) evidence-based framework for the allocation of resources, 2) facilitating relationships, information sharing and investment and 3) science engagement program:

I. Evidence-based framework for Tasmanian Government investment in science research

A key initiative associated with assessing Tasmanian Government investment in Tasmania's science research capability has been the development of an evidence-based decision-making framework (the framework). The framework aims to assist development of Tasmanian Government science research priorities. It will also serve to guide the efficient and effective allocation of resources. Finally, it will help the Tasmanian Government to enhance science research sector capabilities, and ensure that these are directed towards strategically important areas for the state.

³ To download a copy of this strategy, please go to www.science.tas.gov.au

Information on community, industry, science research sector and government aspirations and needs will be fed into the framework to produce a set of evaluated, evidence-based priorities for investment attraction purposes and resource allocation. These will be communicated to the Commonwealth Government, as well as Tasmanian science research sector institutions to underpin community engagement and strategic planning.

The framework will facilitate assessment of science research investment opportunities as these arise. A key consideration will be to ensure that science research capability building, sustainability, growth and investment is promoted by the Tasmanian Government through the provision of independent and focused advice on which to base decisions.

2. Facilitating relationships, information sharing and investment

Developing scientific capability depends not only on the availability of appropriate infrastructure, skill sets and investment dollars, but also on establishing good working relationships between science practitioners, industry, government and the community. Through such relationships, the science research sector is able to better understand and meet community needs, as well as seek out and attract investment.

The Tasmanian Government plays an important role in building relationships and facilitating the flow of information among participants in the sector. This is essential to help ensure that the state's strategic science research needs are addressed by Commonwealth Government, public sector and industry-funded institutions and for promoting knowledge application, economic growth and the 'clustering' of science research capabilities.

Reaching our potential seeks to facilitate relationships, information sharing and investment through:

- research and development forums
- support for significant new projects
- skills building seminars
- supporting access to research infrastructure
- intelligence gathering and dissemination.

3. Science engagement program

It is vitally important to engage the Tasmanian community, particularly young people, with science research, to ensure the state possesses the necessary and ongoing human capital to create a competitive and knowledge-based economy. More and more young people are not pursuing a basic level of scientific literacy through their formal education. Furthermore, only about 50 per cent⁴ of Tasmanian adults exhibit adequate general literacy levels.

To ensure a competitive and knowledge-based economy, the Tasmanian Government aims to engage the community with science research, both within and outside the formal education system. Such engagement should increase general community awareness of scientific principles, science career options and the importance of scientific advances for everyday life. Such awareness is crucial for economic development throughout the community.

A science engagement program has been developed under the program to contribute to meeting such aspirations outside the formal education system. Its key elements include:

- assisting delivery of the Commonwealth Government's national science engagement initiative *Inspiring Australia* in Tasmania
- promoting Tasmanian science through marketing and branding initiatives that focus on four key messages:
 - a scientifically literate community paves the way for technological change and informed decision making
 - science research is an exciting career option
 - science research drives economic development and social and environmental well-being
 - Tasmania is a creative centre of science research excellence.

Science engagement initiatives are aimed at key stakeholder groups including the media, politicians and policy makers, citizens, industry and science communicators themselves.

⁴ Australian Bureau of Statistics, *Adult Literacy and Life Skills Survey, Summary Results, Australia, 2006*, Cat no. 4228.0.