

2023-24  
Pre-Budget  
Submission  
January 2023



# 2023-24 Pre-Budget Submission

The Australian Academy of Science welcomes the opportunity to make recommendations for consideration in the 2023-24 budget.

The Academy recommends that the Australian Government:

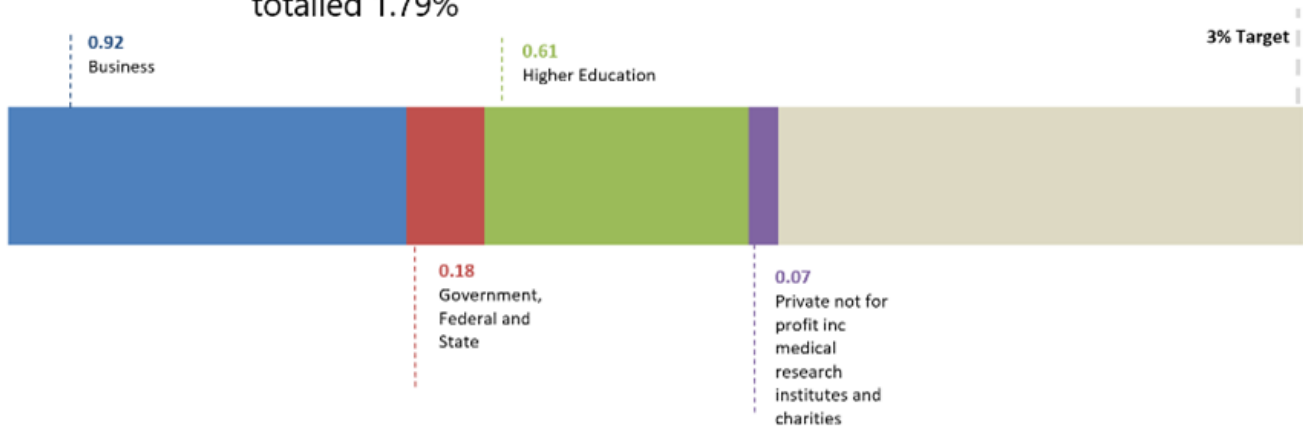
- Establishes a formal target of **3% of GDP** invested in Australian Research and Development (R&D) as a key driver of economic growth, innovation, and competitiveness.
- Undertakes a comprehensive and **independent** review of the Australian science and research sector to identify areas for improvement and potential efficiencies.
- Increases the frequency and extent of measurement of science and R&D in Australia to provide better data for policymaking and decision-making.

Australia has one of the world's least differentiated economies - 91st in the world - largely due to the dominance of minerals and agricultural goods in our exports. The Academy holds that such a situation is unsustainable. Australia should decide the skills and capabilities that we need to build and the research strengths we need to sustain them – namely science, engineering, inventiveness, mathematics, and imagination. This is measured by national investment in R&D.

The government must address Australia's decline in R&D expenditure to regain our position as a global science and technology player and ensure our economic prosperity in the future. To achieve these, we propose five directions to lift Australia's long-term scientific and research investment.

... a comprehensive and independent review of the Australian science and research sector...

In 2020, investment in Australian R&D totalled 1.79%



# 1. Formalise a 3 per cent R&D investment target as government policy

The Australian Government should formally set a target of achieving an R&D intensity of 3 per cent of GDP. Additionally, the government should work closely with the states and territories to improve their R&D performance.

The reasons for setting R&D investment targets are:

- They are an indicator of a country's overall performance in science and innovation.
- They are a measurable goal for science and innovation policy and a powerful tool to guide public and private investments towards knowledge-based activities that promote growth.
- They are an easily communicable and visible metric for science and innovation policy.

Any R&D targets should not be used in isolation and should be accompanied by a strategic vision tailored to Australia's specific circumstances, which requires strong political commitment. Furthermore, international experience has shown that R&D targets alone are not enough but must be accompanied by a strategic approach.

## Australia is investing \$10.6 billion less on science than a decade ago

Australia's investment in research and development (R&D) as a proportion of gross domestic product (GDP) has fallen over the past decade.

Nationally, our investment now stands at 1.79 per cent. A decade ago, this was 2.25 per cent.

If R&D had remained constant, Australia would be investing **\$10.6 billion** more than it otherwise is today.

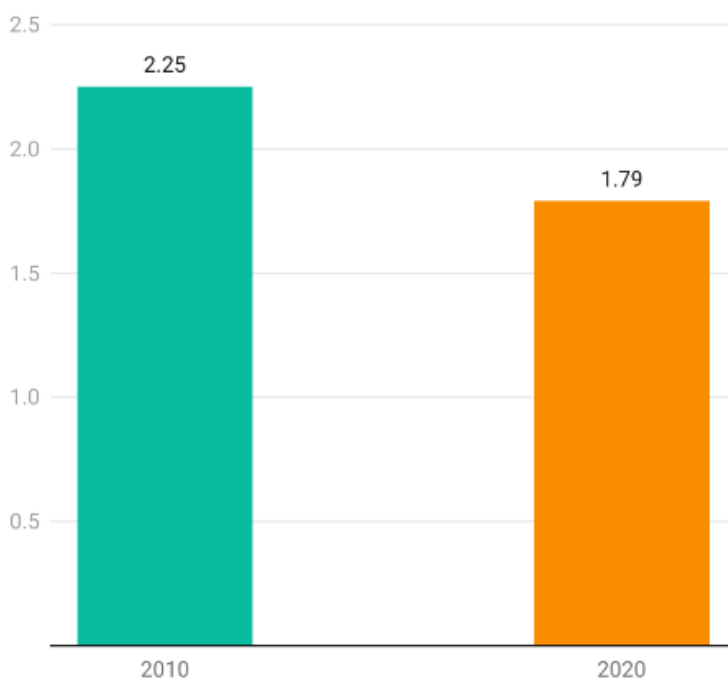


Chart: Australian Academy of Science • Source: Australian Bureau of Statistics • Created with Datawrapper

## 2. Reform Australia's economic structure

A country's level of R&D investment is greatly influenced by structural factors such as industry structure, company sizes, and the presence of multinational companies. Australia's unique comparative advantages in industries such as resources, education, tourism, and agriculture differ from those of other nations and are not typically associated with high levels of R&D expenditure.

The OECD estimates that if Australia had an industrial structure more typical of the OECD average, our R&D intensity would be closer to 2.2% instead of the current 1.79%, equalling \$8.9 billion per annum in 2022.

Policies should be implemented to increase the complexity of the Australian economy and move up the value chain. This will especially impact business R&D, a significantly smaller proportion of total R&D effort in Australia than in many other OECD nations.

**If Australia had an industrial structure more typical of the OECD average, our R&D intensity would be closer to 2.2% instead of the current 1.79%, equalling \$8.9 billion per annum in 2022.**

## 3. Review the Australian science and research sector

Australia's existing system is thirty years old. It requires substantial review and a plausible redesign. It needs renewal, refurbishment, recasting and, in some cases, reimagining.

Over time, *ad-hoc* interventions, various departmental initiatives and overlapping State and Commonwealth priorities have led to a science system spread over [202 programs and 13 federal portfolios](#), with multiple ministers and departments having key responsibilities: an overly bureaucratised and inefficient system.

Australia's research system should be designed to recognise the value of deep knowledge of our world while supporting its application to enhance productivity, build sustainable economic growth, facilitate job creation and new industries, and improve national well-being. The system should develop and sustain scientific knowledge as a national asset.

Most national systems are complex and subject to interventions that shift the focus and blur the purpose over time. Australia is not alone in that regard. Other nations are redesigning their systems to generate more focused and coherent support for research.

The opportunity should be taken to commission an **independent** review of the Australian science and research system across the various silos that have developed – departmental and jurisdictional. While the government has commissioned reviews of the Australian university system, science and research priorities, Diversity in STEM, and the Australian Research Council, linking these endeavours to a national priority to lift our R&D performance is urgently required.

In its absence, an opportunity to optimise the system's performance and identify efficiencies and unmet needs will be missed.

The Academy has previously outlined its proposal for a review, "[A national science and research system for Australia](#)"

## 4. Collect data on science frequently and comprehensively

In Australia, there is a notable gap in data collection on our science, research, and innovation performance. This is evident in the fact that our research and development (R&D) statistics are only collected every two years, which leads to a delay of up to four years in the feedback loop for policymaking.

Furthermore, many statistics collected by the Organization for Economic Cooperation and Development (OECD) are not available for Australia, which results in a reliance on potentially misleading international comparisons. This ultimately means that our policies are not adequately informed by evidence or an understanding of what is and isn't effective for our ecosystem.

The Innovation metrics review, conducted in 2018 and 2019 and released in 2022, notes that a crucial element for developing effective policies that support innovation is the collection and regular reporting of accurate innovation metrics to foster an ongoing national conversation.

Measuring innovation metrics more frequently would help guide policy to achieve R&D targets and give the government a better understanding of how Australia is performing in innovation.

## 5. Prioritise strategic measures

There is a particular Australian disease that infects the performance of our science system. It is the tendency to respond to big questions with tiny thinking. In the science system, that is demonstrated by the proliferation of programs throughout the Australian Government. Moving the dial on our R&D investment will not be achieved by another small grants program or research initiative.

Where the opportunity presents itself, the government should prioritise major strategic investments. There are two exemplars in recent years – the Clean Energy Finance Corporation (CEFC) and the Medical Research Future Fund (MRFF).

The CEFC, over the past ten years, invested more than \$10 billion in renewable energy, energy efficiency and low emissions technology, abating over 200 million tonnes of greenhouse gases. Through its investments, it has helped turbocharge the commercialisation of science and leveraged additional investments from the private sector at a rate of \$2.42 for each \$1 invested. It has also generated a return over that time of \$3.32 billion. Now it is a model that will be expanded into other sectors of the economy through the National Reconstruction Fund.

The MRFF began as a vision for transformative investments to improve healthcare in Australia. It has achieved the long-term vision of a \$20 billion fund with returns of \$650 million a year to invest. While there remains work to optimise its governance, it has become a major vehicle for lifting university R&D performance (as universities are the major investors in health and medical research in Australia).

Other investments into the science system by the former Government – such as *Australia's Economic Accelerator* program, may prove valuable but are potentially too small scale (\$160 million a year from 2024-25) to achieve the vision outlined above.

To discuss or clarify any aspect of this submission, please contact Mr Chris Anderson, Director Science Policy, at [Chris.Anderson@science.org.au](mailto:Chris.Anderson@science.org.au)

**The CEFC... has helped turbocharge the commercialisation of science and leveraged additional investments from the private sector at a rate of \$2.42 for each \$1 invested.**