SUBMISSION

Submission to the Treasury

Submission to the Economic Reform Roundtable

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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.

The future of Australia's economic prosperity is productivity and innovation. Research and development (R&D) is one of the few levers to facilitate long-term productivity growth that is largely within the control of governments. Stagnating productivity growth over the last few decades, now sitting at just 0.9% (Australian Bureau of Statistics 2023a), is correlated with the long-term decline in Australian investment in R&D, both as a proportion of GDP and compared to international competitors. Increasing investment into innovation can help Australia unlock new technologies, industries and jobs, find new markets, and address pressing national challenges, and support Australia's sovereign capability and economy. This will require a joint effort, led by the Australian Government, in partnership with state and territory governments, industry, universities, research institutions and not-for-profit organisations.

ATSE recommends that Australia's governments (state, territory and federal), in collaboration with industry, universities and not-for-profit organisations, boost Australia's annual investment in research, development and innovation to 3% of GDP, as part of the economic reforms.

Economic opportunities

Australia's declining investment in R&D has real world consequences for Australia's future economic prosperity. R&D output measures like research publication numbers are associated with increased productivity and economic growth. International research shows that increased patent applications are associated with increases in productivity and GDP growth (Chang et al. 2013), while higher numbers of academic publications per research dollar have also been linked with greater GDP growth (Arana-Barbier 2023). Growth in R&D investment is also directly linked with increased GDP growth in developed countries (Geci and Hoxha 2025).

Across the OECD, R&D investment has shown a strong association with productivity growth (Soete et al. 2022). Analysis by the CSIRO has also found that every dollar invested into R&D in Australia, returns a total of $3.50 to the Australian economy, with investments in specific fields yielding returns of up to 10% per annum – significantly higher the government bonds or private equity market averages (CSIRO 2021)[1]. Based on these figures, ATSE analysis suggests that increasing R&D to 3% of GDP could help to stimulate more than $130 billion of additional economic activity annually by 2035 (ATSE 2024). This return to the economy will help to pay for increases in government funded investments in R&D, limiting the long-term budget impact.

R&D investment has major societal and national benefits, in addition to economic growth. During the COVID-19 pandemic, countries that invested heavily in R&D for vaccines found themselves at the front of the queue for vaccine deliveries, while other countries fought for leftovers. Beyond crises, Australian developments such as the Human Papillomavirus (HPV) vaccines have reduced cervical cancer incidences by 87% for those who have taken it, reducing demand on hospitals, workplace absences and personal hardships for those affected. Local R&D can support national security. It is highly likely that the future of our national security and defence infrastructure will require significant sovereign AI capability to safeguard the nation. Developing these systems locally will give us full control over our own national security and not leave us beholden or vulnerable to foreign companies. Furthermore, Australia's R&D sector employs nearly 200,000 full-time equivalent employees[2], making Australia's R&D workforce as large as that of the biggest private employer in the country. Investing in R&D can help solve uniquely Australian problems and help to ensure our sovereign capability in critical areas such as manufacturing, green energy, agriculture and value-adding mineral processing.

International comparison

Australia's R&D expenditure falls well below what would be expected for a country with our economic strength. South Korea, our closest economic comparator by GDP, spends 4.6% of their GDP on R&D (OECD n.d.). Australia by comparison only spends 1.68%. This level of investment sits well below the average for OECD countries (2.7%) and even further behind that of the word's research powerhouses.

[1] These results align with findings for other comparator countries like Canada ($4.00) and New Zealand ($3.80).

[2] Of these, 81,705 are employed in the Higher Education sector, 91,414 in industry, 15,889 in state, territory and federal government funded positions and 8,339 in the not-for-profit sector (Australian Bureau of Statistics 2024, 2023b, 2020).

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Countries like the United States, Japan, Germany and the United Kingdom all invest around 3% or more of their GDP into R&D (World Bank 2024), with China's investment having grown to 2.6% of GDP in 2023 (OECD n.d.). Importantly, each of these nations have increased their R&D investment since 2000 (National Science Board 2024; OECD n.d.). Australia's R&D investment is slightly higher than in 2000 but has fallen from its peak at 2.4% of GDP in 2008 (World Bank 2024).

This higher investment is reflected in their relative research outputs, with these countries producing far more publications in science and engineering, and producing many more patent applications per capita, than Australia. The growth of R&D investment in China (8.7% in 2023) has resulted in massive growth in R&D output, overtaking the United States as the world's largest producer of science and engineering publications, with output rising by more than 500,000 publications per year in the 10 years to 2022 (National Science Board 2023; OECD 2025).

Country	Science & engineering publications (2022)	Patent applications per million people (2021)	National R&D expenditure as a percentage of GDP (2023)
South Korea	76,936	3598	4.96%
United States	457,335	790	3.45%
Japan	103,723	1770	3.44%
Germany	113,976	479	3.11%
United Kingdom	105,584	173	2.90%
China	898,949	1010	2.58%
Australia	62,305	115	1.66%

Table 1: R&D outputs by country. Contains publication data from National Science Board (2023), patent data from World Bank (2025) and expenditure data from (OECD 2025).

Pathways to 3% of GDP

The Australian Government cannot be expected to make the required R&D investment alone. Investment of this scale will require buy-in from across the innovation ecosystem, with industry, research centres, universities and private not-for-profit organisations partnering with state, territory and federal governments to build the sector and stimulate investment. However, increasing government investment is associated with growth in private sector investment (Soete et al. 2022), and the government can play a key role in coordinating the sector. Change will not come from keeping the same policy settings and investment; the Australian Government will need to lead the way to reaching the 3% target.

The Australian Government is currently investigating ways to improve Australia's R&D ecosystem through the Strategic Examination of Research and Development (SERD). ATSE supports this work, and notes this review cannot just tinker around the edges – it must work boldly to increase the overall investment in R&D. ATSE's submission to the SERD recommends utilising R&D rebates, revenue contingent loan schemes and international funding schemes to support and grow Australian R&D (ATSE 2025a). A Federal Government agency could help to coordinate the hundreds of state, territory and federal programs, reducing duplication and inefficiency, and making it easier for innovators to access funding and bring new products to market. This agency could also help to create a mission-focus approach to R&D, bringing the full might of Australian innovation to solve local problems with local solutions. Part of this work needs to focus on increasing the number of domestic research students[3] and ensuring research employment opportunities for these students following graduation, including for underrepresented cohorts. This will build a talent pipeline to support the

[3] The Australian Universities Accord has some recommendations on how to achieve this, including increasing the currently below minimum wage stipend rates for research students.

required growth of the R&D sector. Completing the SERD and implementing its recommendations with a goal of increasing R&D investment will be important to ensuring an impactful and efficient R&D sector.

Increasing industry R&D will necessitate policy settings that support investment and collaboration. The largest form of R&D investment in Australia (in dollar terms) is the R&D Tax Incentive (R&DTI). The R&DTI is intended to offset the costs of industry R&D to encourage industry investment in R&D. However, the 2016 review of the R&DTI found that it was not optimal for encouraging research that would not have otherwise been conducted. The review made a range of recommendations, only some of which have been implemented. The remaining recommendations could form the basis of changes to industry R&D policy to support growing R&D investment from industry. Existing collaborative programs like the Cooperative Research Centres (CRCs) and the Research and Development Corporations (RDCs), that bring together industry and academia, form a strong basis for building industry-academia connections. Increasing support for these programs would help unlock industry investment and boost industry-academia collaborations.

ATSE has recently released our *Boosting Australia's Innovation* report, which we have attached to this submission for the Panel's consideration. This report outlines some of Australia's challenges with innovation, research and development in more detail than can be achieved in this submission and provides a dozen recommendations on how to improve Australia's innovation sector. These include recommendations around ensuring institutions are set up for R&D commercialisation, improving cross sector collaboration and increasing innovation investment (ATSE 2025b). Importantly, the report takes a whole-of-sector approach, recognising the roles of governments, businesses and universities. The report's recommendations can help the Australian Government plot a pathway to a stronger and more well-funded R&D ecosystem.

Recommendation

ATSE recommends that the Economic Reform Panel supports a raise in R&D investment across all sectors to the 3% of GDP level that leading R&D nations spend, exceeding the OECD average of 2.7% of GDP. As outlined above, Australia has fallen well behind international standards for comparable nations. This lack of investment is linked with lower productivity growth and reduced future economic activity, risking Australia's prosperity and sovereign capability. Siezing this opportunity to reinvest into Australian innovation will see the opposite – stronger sovereign capabilities, productivity growth and GDP growth. ATSE's previous work on Boosting Australian's Innovation and the work currently being conducted by the SERD provide a strong foundation to begin the process of boosting Australia's investment in innovation and growth.

Recommendation: Australia's governments (state, territory and federal), in collaboration with industry, universities and not-for-profit organisations, boost Australia's annual investment in research, development and innovation to 3% of GDP.

ATSE thanks the Treasury for the opportunity to respond to the Economic Reform Roundtable. For further information, please contact academypolicyteam@atse.org.au.

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