

**Australian Academy of Science submission on the
*Inquiry into artificial intelligence and data centres***

The Australian Academy of Science welcomes the opportunity to comment on the *Inquiry into artificial intelligence and data centres*.

Australia has an opportunity to harness the current surge in data centre investment to contribute to the economy, technological innovation and research capability. This will require policy settings that capture longer-term benefits domestically rather than flowing entirely offshore. This submission proposes conditions that could be placed on hyperscalers and data centre operators' investment to support Australian research and development (R&D).

Artificial intelligence (AI) is defined by CSIRO as "a collection of interrelated technologies used to solve problems autonomously and perform tasks to achieve defined objectives without explicit guidance from a human being."¹ Data centres are physical facilities that provide the power, cooling, connectivity and physical infrastructure needed to house both data storage and computing equipment, depending on the clients of the data centre. This equipment can support a broad range of digital services, such as cloud storage, online banking and artificial intelligence tools.

Data centres underpin essential digital services for government, business and society, in areas such as health care, finance and national security. Australia's data centre industry is rapidly accelerating, driven by advances in artificial intelligence requiring large datasets and computing capacity to train AI models. These AI workloads, particularly large-scale model training and real-time inference, are more energy and data intensive than traditional computing, which places new pressures on infrastructure scale, reliability and energy supply.

Alongside this, the Australian Government has a significant opportunity to demonstrate leadership through sustained investment in Australian AI capability. Without that investment Australia risks becoming a major host for global data centre infrastructure while lacking a comparable sovereign AI capability of its own. This will limit the nation's ability to harness the benefits of responsible AI adoption and increase exposure to shifts in the geopolitical and technology landscape.

The Academy recommends:

1. data centre operators be required to invest in local R&D capability development. This could include a levy, with the revenue invested in public national computational infrastructure and/or AI research.
2. data centre operators are required to: (a) ensure researchers can move data between storage facilities with no costs, waiting periods or technical barriers, and (b) ensure researchers retain ownership of intellectual property.
3. data centre and AI infrastructure developers contribute to trusted public data and knowledge infrastructure, including scientific data repositories, metadata standards, provenance mechanisms and long-term stewardship of publicly accessible information resources that underpin AI development and scientific discovery.
4. implementation of the Australian Government's expectations of data centres and AI infrastructure developers includes transparent assessment criteria such as measurable reporting obligations, independent assurance, and clear consequences for misaligned actions. Proposals failing to meet the expectations should not be considered by government.
5. the Australian Government undertake strategic planning and targeted investment in next-generation high-performance computing and data (HPCD) infrastructure.

¹ Hajkowicz SA, Karimi S, Wark T, Chen C, Evans M, Rens N, Dawson D, Charlton A, Brennan T, Moffatt C, Srikumar S, Tong KJ. (2019) Artificial intelligence: Solving problems, growing the economy and improving our quality of life. CSIRO Data61, Australia.

6. data centre operators should be required to hire skilled workers onshore and contribute to Australia's AI literacy.

Data centres should be required to invest in local R&D

Australia has an opportunity to create policy settings to ensure that private investment in establishing data centres is not extractive and creates a thriving digital ecosystem that supports research and research-industry partnerships. If data centres are to be built on Australian shores, using Australian power, water and land, they must deliver value back to the community.

There has been a significant lack of public investment in AI research in Australia, compared to other jurisdictions. The United Kingdom announced a [£1.1 billion](#) plan to build domestic AI computing capacity earlier this year. The Singapore government will invest over [AU\\$1.13 billion](#) in public AI research through 2030. As Australia lacks comparable public investment yet is increasingly seen as an attractive destination for foreign data centre investment, these developments should be leveraged to strengthen domestic research, innovation and industry capability.

A consistent and reliable way for hyperscalers and data centre operators to invest in local R&D capability development is an R&D levy on their revenue, potentially offset by quantifiable onshore R&D investments eligible for the R&D Tax Incentive (RDTI). This is similar to the Research and Development Corporation levy model already used in Australia's agricultural, fisheries and forestry sector. The Academy proposes a levy of between 0.5% and 2.5% of revenue, with 2.5% the preferred rate. This figure is indicative only, and the Academy recommends further detailed analysis by the Australian Treasury to determine the most favourable arrangement. The Academy has previously modelled a [broad R&D levy](#) that could be used as a basis.

The funds raised from the levy could be used for one or a combination of:

- investment in public national computational infrastructure, ideally to reach exascale, enabling merit-based access for research and backing technical support and skills development for researchers
- establishment of a sovereign AI/digital research fund to be allocated through an appropriate competitive grants system, e.g. through the Australian Research Council's (ARC) national competitive grants schemes

This local R&D investment requirement should be mandated by the Australian Government as part of agreements with data centre and AI infrastructure developers to build local capability should be supplementary to baseline government funding.

As an alternative or in addition to the levy, data centre operators could provide infrastructure or capacity for publicly funded R&D. This could include providing computing capacity at no cost for non-commercial publicly funded research, which would supplement national research infrastructure. This could be allocated through the existing National Computational Merit Allocation Scheme (NCMAS) and include dedicated requisite technical expertise. This would require governance and operational uplift to NCMAS, that would need to be supported.

Additionally, data centre operators could be required to allocate some data storage capacity as free access to research users to store research data. This storage allocation should be awarded alongside the computing allocation since research data is typically most useful when held in the same system as the compute used to process it. This only works if there are mandatory clear and no cost data transfer mechanisms. Agreements with data centres must include clauses to let researchers extract and move their data without financial penalty, waiting periods or technical barriers. Freedom to move their data and change providers should be a critical feature of any deal with a provider. There also needs to be agreement that researchers retain any and all intellectual property of data and code developed on privately owned systems.

Data centres should contribute to Australia's research data infrastructure

Large-scale AI systems rely not only on compute, energy and physical data centres, but also on high-quality, curated, publicly accessible datasets, metadata standards, domain knowledge and long-term data stewardship. Many of these information resources are produced and maintained through publicly funded science and research infrastructure. To make these resources usable while protecting research interests, investment is also needed in privacy-preserving and secure data-sharing infrastructure, identity and access controls, provenance, and auditable governance.

National security and data sovereignty are essential considerations. Some research data may have high confidentiality or present national security issues if able to be combined with other datasets (e.g. genomic data). The government should be able to maintain visibility of what research data types are stored by commercial providers and contracts must guarantee safe data stewardship and ownership of the data by the researcher.

Where AI developers benefit from publicly funded data and knowledge resources, policy settings for AI and data centres should ensure that they contribute to the long-term sustaining of those resources, including through support for data repositories, provenance, attribution, licensing, and responsible access frameworks.

Strong data centre expectations should help mitigate negative impacts of data centres and incentivise Australian innovation in energy and water use

The Academy welcomes National Cabinet's agreement on 26 August 2026 that the Australian Government's [Expectations of data centres and AI infrastructure developers](#) will be mandatory. To be effective, these standards should be implemented through transparent assessment criteria such as measurable reporting obligations, independent assurance, and clear consequences for misaligned actions.

Data centres have the potential for significant negative environmental and climate implications. A recent United Nations report has shown that AI is now one of the most significant drivers of data centre growth and energy consumption, with AI workloads accounting for 20% of total data centre electricity use in 2025.² In the United States, greenhouse gas emissions have increased for the first time in three years, partly driven by the demand from data centres. Communities in the United States and Ireland have reported rising energy and water prices and water shortages due to the demand placed by data centres.

Australia must learn from these jurisdictions and mitigate potential impacts on energy, water supply and the environment. The [Australian Energy Market Operator has projected](#) that data centre electricity consumption will increase by around 25% annually, with data centres predicted to draw almost as much power from the grid by 2036 as [all homes in NSW and Victoria](#) combined do today. Without a corresponding increase in renewable generation, this scale of growth in demand risks making Australia's energy transition and emissions reduction targets significantly harder to achieve.

Strong, measurable and enforceable expectations are key for data centre operators to earn the social licence to operate in Australia. The current expectations state that the Australian Government will prioritise proposals most closely aligned with the expectations and that energy-intensive proposals not closely aligned will not be prioritised in Commonwealth regulatory assessments. As these expectations are brought into a mandatory national framework, this threshold should be strengthened, whereby proposals that do not align with the expectations should not be considered by government, rather than simply deprioritised.

The expectations state that: "Data centres should use innovative, efficient and sustainable solutions to minimise water use." Australia has an opportunity to become a world leader in sustainable technology use in data centres. Australian-owned data centres have found innovative solutions that significantly reduce water consumption compared to conventional approaches. For example, the CDC reports saving [five gigalitres of water](#) a year through their closed-loop water cooling system, compared to similar sized data centres.

Other opportunities include innovating in more energy-efficient chips and server architecture that requires less power and cooling, and optimising workloads to minimise energy and water consumption. The government could encourage further innovation by creating a program to open source the best possible sustainable designs for data centres. [La Trobe University](#), funded through a \$1.1 million grant under the Federal Government's National Critical Technologies Challenge Program, is working to improve cooling, ventilation, and resource efficiency in data centre facilities.

A long-term national high-performance computing and data strategy is needed

High-performance computers are specifically built to solve large, complex problems by processing massive datasets and running simulations at speeds far beyond standard computing. Access to high-performance computing and data (HPCD) infrastructure is critical to Australia's research and development capability, including

² Aczel M., Chamanara S., Matin M., Farsi A., Marwala T., Madani K. (2026) Environmental Cost of AI's Energy Use: Carbon, Water and Land Footprints, United Nations University Institute for Water, Environment and Health (UNU-INWEH), Richmond Hill, Ontario, Canada, doi: 10.53328/INR26RMA002

research involving AI models, but Australia has no national plan to invest in maintaining, expanding and ensuring access to HPCD capabilities by the Australian scientific community.

Both of Australia's Tier-1 facilities are oversubscribed and demand is anticipated to increase. The Academy has been consistently advocating on this issue. The [Australian Government response to the Senate Select Committee on Adopting AI report](#) only mentions HPC as an existing capability and focuses on data centres when discussing AI infrastructure. These cannot be considered separately and are all part of our national digital research infrastructure system.

AI development is reshaping the scale and nature of compute demand. As AI becomes embedded in scientific workflows, it accelerates discovery but shifts bottlenecks toward verification, simulation, and data handling. Researchers wanting to train large AI models will need access to graphics processing units (GPUs). National (Tier-1) HPC facilities need to be upgraded and expanded to ensure they are equipped to meet the growing demands of data-intensive research needs.

Although Australian research and industry would benefit from increased investment and capacity for HPCD, this is not the intent behind the massive increase in planned data centre construction, which is largely driven by demand for commercial AI infrastructure.

The Academy calls on the Australian Government to set out a long-term national HPCD strategy and roadmap to build and ensure access to national capacity, with targeted investment in next generation HPCD infrastructure for scientific purposes over the next 10 years.

Australia's AI skills gap needs to be addressed

AI is reshaping how science is practised by augmenting scientific capabilities and accelerating discovery. Successful applications of machine learning approaches include weather forecasting, modelling protein-folding and image classification (such as processing of biomedical imagery, or species identification tools).

Generative AI can supercharge manuscript preparation, but it can also overwhelm publishers and competitive grant schemes with submissions, putting additional strain on the peer-review system. AI 'scientists' or research assistants capable of operating under the direction of human researchers are now emerging in practice, indicating a transformative shift in the landscape of scientific inquiry. [Researchers at the Garvan Institute](#) are building teams of AI agents to search for information relevant to a patient's diagnosis, such as checking population databases, searching clinical registries, or monitoring published literature.

The Academy has published a series of discussion papers titled '*Is Australian science ready for AI?*' that explore the preparedness of the Australian science sector for AI advances.³ Areas of priority include building Australia's sovereign AI capability by addressing Australia's skills gap. There is a growing need to equip researchers with AI skills, suggesting the value of integrating these capabilities into research training programs. The adoption of AI is currently impeded due to a shortage of AI skills in the Australian workforce and insufficient understanding of AI across sectors. The findings of Academy report *Australian Science, Australia's Future: Science 2035* indicate gaps in Australia's education and workforce for both data science and AI capability.⁴

Analysis by Jobs and Skills Australia has shown that there is a growing demand for AI skills in job advertisements, along with broader digital and complementary skills such as critical thinking.⁵ The report noted that adaption of education and training will be critical to how the Australian economy adapts to the AI transition.

Hyperscalers and data centre operators can contribute to the development of a skilled workforce in Australia, however there are limited policy levers to enforce this. They should also be required to make commitments to uplift both researcher and general population AI literacy through education initiatives, or funding for programs that support Australia's scientific workforce. This may be through:

³ Australian Academy of Science (2025). *Is Australian science ready for AI?* <https://science.org.au/our-work/resources-reports/reports-publications/australian-science-ready-ai>

⁴ Australian Academy of Science (2025). *Australian science, Australia's future: Science 2035*. <https://doi.org/10.82202/fph6-zg12>

⁵ Jobs and Skills Australia 2025, Generative AI Capacity Study: Final Report Overview, Canberra. <https://www.jobsandskills.gov.au/publications/generative-ai-capacity-study-report>

- Development of teaching resources (e.g. the [Australian Academy of Science's education resources](#) and the [Australian Academy of Technological Sciences and Engineering STELR program](#))
- Support for workforce, diversity and equity programs (e.g. [Science & Technology Australia's Superstars of STEM program](#) – this could be targeted towards supporting researchers working in computing and/or AI)
- Scholarships and cadetships
- Partnerships with organisations
- Funding industry PhDs, and
- Data literacy programs for researchers.

These could be delivered in partnership with the National AI Centre or Office of AI to target the areas of greatest need.

To discuss or clarify any aspect of this submission, please contact Lauren Sullivan, Science Policy and Advice Manager at science.policy@science.org.au.