SUBMISSION

Submission to the Public Accountability and Works Committee

Submission to the Inquiry into data centres in New South Wales

27 March 2026

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.

In a world of artificial intelligence and big data, data centres are becoming an increasingly important element of protecting Australia's national security and sovereignty, enabling data to be stored and accessed onshore. New South Wales' comparative advantages can be leveraged by businesses looking to build data centres, allowing the state to build new digital economies and support resilience of the numerous industries that rely on data centres. Like all major infrastructure though, if not properly managed, data centres can have significant negative impacts on local communities. Current data centres are power hungry, thirsty and noisy, meaning coordinated planning is required to manage impacts on utilities and communities. Establishing guidelines at the outset of this new industry will help to ensure data centres maintain a widespread social licence and support a long-term sustainable sector that benefits the state. The Federal Government recently released its expectations of data centres and AI infrastructure developers. These expectations align with ATSE recommendations to support a growing NSW data centre industry that boosts the NSW economy while maintaining social licence:

Recommendation 1: Develop a statewide Data Centres Strategy to support the state to seize economic opportunities in, and make planning decisions about, data centres.

Recommendation 2: Ensure planning approvals consider the power usage efficiency (PUE) of data centres and encourage deployment of energy efficient technologies, designs and practices.

Recommendation 3: Establish a Data Centres Research and Innovation Partnership program connecting hyperscale operators with Australian universities and research institutions to co-invest in emerging efficiency technologies with a focus on commercialising Australian innovations and attracting further sovereign capability investment.

Recommendation 4: Require new data centres to support the deployment of new renewable energy generation and storage through direct investment or power purchase agreements for future projects to mitigate increased energy demand on the grid.

Recommendation 5: Minimise data centres' impacts on water supplies by embedding water efficiency and recycling guidelines at the planning stage.

Recommendation 6: Require that data centres are located away from residential areas wherever possible and have appropriate noise and pollution reduction technologies where co-location with residential areas is unavoidable.

Recommendation 7: Include plans to boost the construction and operational workforces of data centres in NSW within a statewide Data Centres Strategy.

Unlocking the value of data centres

Data centres represent critical infrastructure that is vital to Australian industry, government services, national security and more. This infrastructure is only becoming more important with the rise of widespread artificial intelligence systems, industry 4.0 and an increasingly interconnected online environment. There are already 270 data centres in Australia, including over 100 in New South Wales (Data Center Map, 2026), with an estimated economic value of $9.5 billion estimated by 2028 and these data centres could support an AI and automation industry expected to be worth $600 billion by 2030 (Baringa & Clean Energy Finance Corporation, 2025). Australia is now the country with the second highest investment in data centres (after the United States) and one of only four APAC nations with privileged access to Nvidia chips (Kight Frank, 2025). This local data centre industry supports Australian users with lower response latencies, making data access faster, and allows for Australian data to be stored domestically, reducing privacy and security risks to users. The NSW Government has recognised these benefits, developing their own GovDC data centres alongside Equinox (Digital NSW, 2026).

Making the most of this opportunity, and managing the challenges that come along with it, will require a coordinated state-wide approach. A NSW Data Centres Strategy would provide certainly for the sector and help manage the challenges likely to come with increased data centre development in the state. Such a strategy could define priority zones for data centres (similar to Renewable Energy Zones) in areas where data centres have the best access to required utilities and would have minimal adverse impacts on communities. This could help to accelerate planning approvals while supporting a coordinated approach to data centre development that leverages locations in New South Wales with comparative advantages.

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NSW also has an opportunity to leverage Australia's quantum research ecosystem as a point of differentiation in the global data centre market. Strengthening collaboration between data centre developers and quantum research institutions could attract investment in next-generation computing infrastructure and build long-term sovereign capability, rather than primarily hosting commodity infrastructure.

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Managing electricity demand of data centres

The notably high electricity requirements of data centres are a key challenge to be managed as the industry develops. AEMO CEO Daniel Westerman has estimated that data centres may consume 12% of all power generated nationwide by 2040 (McGuire, 2025), rising from 4TWh currently to 34TWh by 2049-50 (under the Step Change scenario; (AEMO, 2025). However, this should be viewed in the context of predictions that overall demand for electricity will nearly double by 2040 due to the electrification of all energy use in every sector of the economy (AEMO, 2026). AEMO will need to carefully plan for this increased energy demand to minimise adverse impacts and increased costs borne by the state or other electricity consumers. Where significant demand increases the need for additional grid-based generation or storage, costs of this infrastructure may be passed onto consumers as higher power prices. Requiring data centre operators to plan for this increased power consumption is necessary to ensure that data centres are a net economic benefit to the state.

A benefit of electricity demand from data centres is that it is near-continuous, providing consistent demand across the day and across seasonal and weather changes. As outlined in ATSE's *Power to the People: Demand Side Management Explained*, grid system reliability is greatest when there is only a small gap between peak demand and minimum demand. The relative consistency of data centre electricity consumption can help to raise minimum demand, helping to maintain system reliability during times of otherwise low demand. Alternatively, it is also possible to schedule data centre electricity usage (e.g. for AI learning algorithms) to time-shift electricity demand. This can allow Australians to make greater use of curtailed midday solar energy, reducing wasted generation. Continuous consumption also increases peak demand, requiring additional generation, though the benefits of improved inertia and system strength during minimum demand may outweigh these costs if data centres are managed and located appropriately.

Data centre design and the technologies employed can have a substantial difference on data centre power consumption. When scaled, energy efficiency technologies can minimise the impact of data centres on grid demand and reduce operating costs for data centre owners. Energy efficiency in data centres is usually measured via power usage efficiency (PUE) – the ratio of total power consumption compared to the power require to run the IT systems[1]. As such, focus has mostly been placed on improved cooling technologies, the largest source of energy usage beyond the required IT systems. Rack layouts, plant sizing, night purge cycles and under floor cooling can all reduce energy consumption from cooling (DCCEEW, 2025). There is also promising research that could reduce the underlying energy consumption of IT systems, including new research into developing hardware that relies on optical technology to replace electronics – e.g. as being developed at the University of Sydney (Sved et al., 2026) – though this will not be market ready in the near term. Quantum computing may also reduce the energy consumption of IT systems in data centres, with application-ready systems expected by 2028 (Soller et al., 2026). Australia's emerging quantum research capability presents a strategic opportunity: investment in quantum-ready data centre infrastructure in NSW could accelerate commercialisation while delivering economic, environmental and security co-benefits, positioning the state as a hub for next-generation computing. Emerging low-loss transmission technologies, including superconducting cable infrastructure and advanced cryogenic cooling systems, represent further opportunities to reduce data centre energy consumption. NSW could support research partnerships between data centre operators and Australian research institutions to develop and pilot these technologies locally, building on Australia's growing capability in quantum and advanced materials to help position NSW as a leader in sustainable data centre innovation.

Coordinating planning approval for data centres with energy generation can help ensure that energy consumption is optimised and avoid passing on costs to the state or other consumers. Many data centres in NSW are already required to have power supply contracts as part of the planning approvals process. Where these contracts help to fund additional renewable generation and storage, data centres can help to

[1] Total power consumption primarily consists of consumption from IT systems, cooling and lighting. A higher PUE indicates worse energy efficiency. A PUE of 1.0 would indicate that a data centre is only using energy to power their IT equipment.

accelerate the renewable rollout and manage increased energy demand. Where data centres are located near to Renewable Energy Zones, this can further reduce transmission congestion and investment costs and improve infrastructure utilisation, allowing for lower infrastructure investments. However, data centres also need access to high-capacity telecommunications connections – potentially limiting viable sites or requiring additional infrastructure upgrades to support co-location.

Recommendation 2: Ensure planning approvals consider the power usage efficiency (PUE) of data centres and encourage deployment of energy efficient technologies, designs and practices.

Recommendation 3: Establish a Data Centres Research and Innovation Partnership program connecting hyperscale operators with Australian universities and research institutions to co-invest in emerging efficiency technologies with a focus on commercialising Australian innovations and attracting further sovereign capability investment.

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Minimising the impacts of data centres on water systems

Data centres are reliant on water to cool the IT equipment to avoid overheating. Data centres already use around 3.5 billion litres of water in Sydney, and Sydney Water is planning for up to 25% of water consumption to occur through data centres by 2035 (Shine & Smith, 2025). Providing for this thirst will be a major challenge and, if poorly managed, could require additional desalination to meet the water needs of cities, industry and agriculture. A combination of careful planning and technological solutions will be required to ensure sufficient water supplies, in the context of a changing climate which will exacerbate existing pressures on water systems. Like the additional energy required for data centres, the water needs of data centres are best considered at the planning stage to ensure that data centres are not a net economic loss to the state.

There is an interplay between power and water consumption for data centres. The most energy efficient cooling systems tend to use evaporative cooling, though this uses more water and also has limited viability in humid climates. Conversely, closed loop liquid cooling uses far less water[2], at the cost of increased power consumption. Other new cooling technologies combine closed loop liquid with air cooling to obviate the need for any water consumption. Water consumption is typically measured by Water Use Efficiency (WUE), which measures water usage per kilowatt-hour. Most leading facilities aim for WUE below 0.5 L/kWh (Apstech Advisors, 2026). Onsite water recycling, heat exporting and well selected locations (e.g. cooler or less humid locations) can help to reduce water use in cooling, without significant energy increases. Setting clear standards for water efficiency for proposed data centres can help build water saving measures into data centre design and minimise the long-term impacts on NSW's water system. The state government could consider requiring data centres to provide their own water supplies through desalination (noting the additional energy requirements of desalination), water recycling, or use of innovative technologies (such as seawater or deep lake cooling) so as not to impose additional costs on municipal water systems.

Recommendation 5: Minimise data centres' impacts on water supplies by embedding water consumption, efficiency and recycling guidelines at the planning stage.

Maintaining social licence

Maintaining social licence is critical for the long-term development of Australia's data centre industry. Experiences from other jurisdictions has shown that data centres are often contested by the communities in which they are located or seek to locate (e.g., Chow, 2025). Local governments are increasingly rejecting proposals for data centres – for example, a 213MW centre was blocked by local councillors in Edinburgh, Scotland due to concerns about community impacts and power consumption (Gooding, 2026). While proposed NSW data centres over 15MW are eligible for Significant State Development status – allowing

[2] CDC boasts that closed loop liquid cooling saves them 5 GL of water each year across their 13 New Zealand data centres (CDC, 2025).

planning approval to occur at a state level, rather than a local level – failing to prioritise the needs of local residents will ultimately undermine support for data centres and make future investment more difficult.

Residents' primary concerns focus on utility (water and electricity) consumption and local noise and air pollution. Utility usage can cause strain on local resources, particularly in areas already relying on desalination for clean drinking water, and can increase utility prices as demand rises. Polling data from the United States shows a direct relationship between reduced community support for data centres and increased utility prices (Plautz & Marshall, 2026).

While there is general support for data centres, few residents support them close to their homes (Plautz & Marshall, 2026). Some of the solutions for power and water consumption, such as cooling systems and onsite generation can produce significant and continuous noise and air pollution for local residents. Unlike many traditional industries, data centres run 24 hours a day, giving residents little relief from noise pollution. Click or tap here to enter text.It is therefore important that planning approvals processes recognise and mitigate these concerns to ensure continuing community support. This could be achieved through locating data centres away from residential areas, or through noise dampening and pollution capture technologies. Ensuring local employment opportunities for desirable jobs would also support social licence for data centres.

Recommendation 6: Require that data centres are located away from residential areas wherever possible and have appropriate noise and pollution reduction technologies where co-location with residential areas is unavoidable.

Fostering a skilled data centre workforce

A growing data centre industry will require two very different workforces: a temporary construction workforce to build the data centres and an ongoing operational workforce to run them. Construction is limited by the availability of a construction workforce, which the NSW Government already recognises is short 197,000 workers (Transport for NSW, 2026). This is not a new or isolated phenomenon, with 33% of all technicians and trade occupations nationwide in a persistent shortage (Jobs and Skills Australia, 2025). The ongoing operational workforce will require people with skills in managing hardware, networks, physical infrastructure, security, performance optimisation, machine learning and more. This workforce is expected to more than double from 8,300 in 2024 to 17,900 nationwide by 2030, but there is currently a significant shortage of ICT professionals in Australia (Mandala, 2024). In total, 4 out of 10 roles required for data centre construction and operation are currently in shortage (Mandala, 2024). The Data Centres Strategy proposed by this submission would include a section outlining how these skills shortages will be addressed, with co-benefits across related industries. This would interface with the NSW Digital Strategy which aims to uplift digital capacities in the public sector and the NSW Digital Skills Workforce Compact which focuses on digital skills education and training. Planning to increase the data centre workforce can leverage and build upon existing successful programs, such as ATSE's Elevate: Boosting Diversity in STEM program, which provides participants with scholarships and wrap-around support including mentoring and networking, workshops, and access to wellbeing support. Elevate boasts a 98% retention rate, providing a targeted mechanism for increasing the size and diversity of the STEM-skilled workforce.

Recommendation 7: Include plans to boost the construction and operational workforces of data centres in NSW within a statewide Data Centres Strategy.

ATSE thanks the Public Accountability and Works Committee for the opportunity respond to the inquiry into data centres in New South Wales. For further information, please contact academypolicyteam@atse.org.au.

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