Submission No 115

INQUIRY INTO DATA CENTRES

Organisation: Veolia Australia and New Zealand

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Ms Abigail Boyd, MLC
Chair
NSW Legislative Council Public Accountability and Works Committee

via online

Dear Chair,

Veolia welcomes the opportunity to provide input to the New South Wales Parliamentary Select Committee's inquiry into data centres (the inquiry). Our response to the Terms of Reference is attached to this letter. We make several recommendations that we believe would improve the data centre sustainability while also enabling the sector's growth.

Veolia is a long standing and highly regarded operator in Australia's data centre sector. We are also a leader in water, waste, and energy management - capabilities directly relevant to the sustainability challenges the data centre sector faces. The group has nearly 220,000 employees worldwide, including 7,000 employees in Australia and New Zealand across 300 locations.

Australia is an ideal location for data centres with stable geography and political systems. In coming years, data centre numbers are expected to accelerate, requiring up to 15% of Australia's grid electricity by 2035, risking emissions growth and higher household energy costs. More water will also be required putting pressure on a resource whose availability will become highly variable under climate change.

We believe the New South Wales Government can take advantage of the economic opportunity data centres offer and manage their impacts by (in summary):

- Require data centres to invest in or co-locate with renewable energy generation supported by clean back up systems such as batteries
- Set energy and water efficiency standards for data centres that tighten over time
- Start working with communities now where data centres *may* be located, particularly in renewable energy zones
- Introduce water and electricity use reporting requirements that ramp up over time
- Establish minimum standards for the responsible management and recycling of data centre hardware waste

Thank you again for the opportunity to provide feedback. Should you have any questions or require clarification on our submission, please contact , Veolia's Head of Government Relations,

Yours faithfully,

Craig Barker
CEO & Managing Director, Veolia Australia and New Zealand

Introduction

Data centres are now essential global infrastructure driven by cloud computing and artificial intelligence (AI). Each new cloud region requires large-scale, low-latency data centre capacity, creating sustained demand for hyperscale-ready campuses. High-performance AI computing for training and deploying large models requires graphics processing unit-dense environments needing resilient power and advanced cooling.

As an experienced data centre operator and provider of water, energy and waste management services to data centres in Australia and internationally, Veolia is well placed to respond to this inquiry. We believe a holistic policy suite is needed to ensure the sector's growth benefits New South Wales (NSW) while also controlling for water demand, emissions, waste and community impacts. International policy examples, while still in the nascent stage, can inform the NSW Government's thinking to design a world leading approach.

Australia's Data Centre Boom

Australia is now one of the top five data-centre hubs globally because we:[1, 2]

1. Are globally competitive with robust digital infrastructure including high-capacity subsea cables, and potential scale due to land availability and energy and water infrastructure
2. Are politically secure, geopolitically stable, and with strong strategic alliances makes Australia a trusted location
3. Have a skilled tech workforce underpinning operational scalability and innovation, with a strong university research sector and tertiary education
4. Have strong regulatory frameworks for approvals, infrastructure, data protection and cybersecurity
5. Have a strong institutional capital base, experienced financial system and credible project partners.

In Australia, up to 84% of new data centres could host AI operations for domestic and Asia-Pacific cloud and other computing markets[3], with 65% built as hyperscale[4] centres by 2030. Managing this growth requires a clear regulatory framework while optimising benefits for communities and the economy.

Sydney is Australia's largest and most mature data centre market, with 770 megawatts (MW) of installed capacity with 230MW under development. Hyperscale centres dominate, with 80% of demand from large campus-style deployments.[5] Realising the benefits of data centre growth will require NSW to balance the economic opportunity with impacts on critical water and energy infrastructure, emissions reduction and renewable energy targets, and communities.

Energy demand

Data centres consume significant amounts of energy. In 2025, it was estimated that Australian data centres consumed 3.9 terawatt hours (TWh), or approximately 5% of Australia's grid electricity.[6,7] Data centre capacity is forecast to reach 2.2 gigawatts (GW) and 3.2GW by 2035 equivalent to 8%

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[1] Baringa and CEFC, 2025, *Getting the balance right: data centre growth and the energy transition*, Sydney, NSW
[2] CBRE Research, 2025, *Why Australia for data centres*, Sydney NSW
[3] See Footnote 1
[4] A hyperscale data center is a massive, highly efficient, and scalable computing facility using uniform hardware to support cloud computing, and big data storage, usually for a single tenant. Features include:
- automation for managing immense and potentially unpredictable, high demand workloads with high redundancy (backup systems) to ensure continuous operation
- use sophisticated cooling such as liquid cooling due to high-density, AI-ready hardware, they use sophisticated cooling, such as liquid cooling

[5] Zoha, M Uz, 2025, *Hyperscale data centre expansion in Australia: A White Paper for institutional investors*, University of Sydney and Harvard University, Cambridge
[6] Oxford Economics, 2025, *Data centre demand: Final report*, Australian Energy Market Operator, Canberra
[7] Australian Energy Market Operator, 2025, *2025 Inputs, Assumptions and Scenarios Report*, Canberra

and 11% of Australia's projected electricity consumption. It also represents up to $135 billion in investment, representing a sizable potential boost to Australia's economy.[8]

Without additional capacity, data centre demand could increase wholesale electricity prices by 26% in NSW by 2035.[9] However, if this demand is met by an additional 3.2GW of renewable energy generation, wholesale electricity price increases could be limited to a 7% rise.[10] Price increases could be further limited to 3% by 2035 if 1.9GW of batteries for storing renewable energy is delivered.[11]

Back up generators of existing data centres or new data centres where batteries are not suitable can also be decarbonised.[12] Internationally, internal combustion generators are being decarbonised by using bio-based diesels[13] and biomethane.[14] However, renewable diesel and biomethane availability is limited in Australia. Remedying this will require state and national policy interventions. For example, funding for capital and operating grants to produce and use biomethane, and accelerating biobased diesel fuel quality standards and supporting guarantee of origin certification including for biomethane.

Powering data centres by renewable energy not only limits upward pressure on electricity prices, but also avoids greenhouse emissions and air pollution and, if properly regulated, could limit impacts on the community and the critical infrastructure we all rely on.[15]

We propose that ensuring data centre growth is powered by renewable energy can be achieved by:

- **Planning requirements** - require data centres to be co-located with renewable energy generation. If co-location is not possible, require data centre proponents to invest in additional renewable energy capacity within the National Energy Market.
- **Planning incentives** - introducing a fast-track for applications with integrated or co-located renewable energy generation to offset their energy use plus batteries for uninterrupted supply, supported by a discount on application fees. Proposals that do not include renewable energy aspects would not be allowed to access the fast track or discount.[16]
- **Government procurement** - the NSW Government should adopt the Australian Sustainable Finance taxonomy when purchasing data centre services to encourage renewable energy use and limit greenwashing claims.[17]
- **Bio-based liquid and gaseous fuels** - the NSW Government should consider options to incentivise biomethane use while working closely with the Australian Government to accelerate fuel quality standards for biobased diesels and guarantee of origin certification for biobased fuels and biomethane.

Energy efficiency

Improving data centre energy efficiency is another sustainability opportunity. Power usage effectiveness (PUE) is the current way of measuring data centre energy efficiency. It is a ratio of the total energy used by a data centre divided by the energy used by the IT hardware alone. A PUE closer to 1.0 indicates greater energy efficiency. For example, a PUE of 1.6 means that, for every 1 kilowatt (kW) used for computing, an additional 0.6kW is used to power support services such as cooling.

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[8] See Footnote 1
[9] See Footnote 1
[10] See Footnote 1
[11] See Footnote 1
[12] Kambhampati, V et al, 2024, Moving beyond generators: Exploring renewable backup alternatives for data centres, *Journal of Physics: Conference Series*, 2929: 012008
[13] Bio-based diesels include hydrotreated vegetable oil, biodiesel (FAME - fatty acid methyl ester) and renewable diesel.
[14] Amazon, 2023, *Harnessing the power of plants to decarbonise our data centres*, 9 November 2023
[15] See Footnote 1
[16] A 2021 estimate suggested around 6 million tonnes of carbon dioxide equivalent could be avoided if data centres use renewable energy. See Brocklehurst, F, 2021, *International Review of Energy Efficiency in Data Centres for the Australian Department of Industry, Science, Energy and Resources*, Ballarat Consulting
[17] Australian Sustainable Finance Institute, 2026, Australian Sustainable Finance Taxonomy

Hyperscale data centres can achieve PUEs as good as 1.18, while smaller, less efficient data centres can have a PUE as poor as 1.91.[18] In 2023, the average Australian data centre's PUE was 1.44, 0.01 above the global average (1:45).[19] This means there is scope for the NSW Government to drive innovation and investment in highly energy efficient data centres. Setting energy efficiency requirements is a simple yet effective policy measure for achieving higher PUEs. For example, when China introduced energy efficiency requirements for data centres, the average PUE improved from 1.54 to 1.48 in just one year.[20]

Therefore, we recommend the NSW Government sets minimum energy performance standards for IT equipment and data centre PUE that increase in stringency over time.

Water

Data centres place significant demand on water resources - a particular challenge in a country where water is a scarce resource. Water availability will not only be a concern for data centre proponents but also the NSW communities where data centres are located. Arguably, communities are likely to be more concerned about data centre water use than energy use, particularly as the climate changes.

On average, it is estimated data centres currently consume around 5.5 gigalitres (GL) of water annually, or 0.04 per cent of Australia's total water use.[21] In Sydney, data centres currently consume around 3.5 billion litres of potable water per year, less than 1% of the city's total use. By 2035, Sydney Water estimates data centre water demand could be up to 250 megalitres per day or 15-20% of Sydney's water use.[22],[23]

A similar metric to PUE, Water Use Efficiency (WUE) is reported in litres per kilowatt-hour (kWh).[24] It is calculated using a data center's total water consumption in litres divided by its total energy consumption in kilowatt hours (kWh) over the same time period. The ideal WUE is "0" but this can only be achieved in air-cooled data centres. Globally, the average WUE across data centres is 1.9 litres per kWh.

There are three main types of cooling systems data centres use at the moment:

- **Air cooling**: uses air conditioning and fans to remove heat. It is more water efficient than liquid cooling systems. However, air cooling uses more energy than liquid cooling systems.
- **Liquid cooling**: uses water or other fluids to directly absorb heat from servers, often by a closed loop system. If using water, these systems are more water intensive but use less energy. Many companies are using liquid cooling to achieve very high computing power.[25,26] Liquid cooling systems are often more expensive than air cooling or evaporative systems.
- **Evaporative cooling systems**: use evaporation to cool air. Water is exposed to warm air, drawing the heat from the air and evaporating. These systems are more energy efficient than air cooling but have a high water use. Non-evaporated water needs to be cleaned after a few reuses.

Future data centre water demand will ultimately be determined by which cooling system is chosen, which will consider factors such as location, drought risk, water availability, climate zone, future

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[18] Mytton, D. 2021, Data centre water consumption, *npj Clean Water* 4, 11
[19] See Footnote 1
[20] Lim, J, 2025, Power-hungry data centres threaten Australia's energy grid. Here are 3 steps to make them more efficient, *The Conversation*, 14 October 2025
[21] Mandala and Data Centres Australia, 2025, *Data Centres as Enabling Infrastructure*, Sydney
[22] Water Services Association of Australia, 2025, *Data centres and water in Australia: A resource for sustainable data centre development*, Sydney
[23] https://www.sphereinfrastructure.com/articles-media/ai-data-centres-and-the-water-challenge
[24] See Footnote 21
[25] Liquid cooling is becoming more popular to support higher server density. See Setmajer, A, 2024, How Data Centers Use Water, and How We're Working to Use Water Responsibly, *Interconnections - The Equinix Blog*, 19 September 2024
[26] Kong, R, et al, 2024, Enhancing Data Center Cooling Efficiency and Ability: A Comprehensive Review of Direct Liquid Cooling Technologies, *Energy* 308, 1 November 2024

climate conditions, and IT rack density.[27] However, more information is needed about data centre water use so appropriate standards and regulations can be set.[28]

Water availability studies and impact assessments are needed to understand how data centres might put pressure on local water resources and the sectors that rely on them such as agriculture and the local environment. This is not only important for planning assessments but also for maintaining social licence. Also important for social licence is requiring data centres to pay for infrastructure upgrades, ideally that also benefit the community such as refurbishing existing water treatment infrastructure.

To ensure optimal water management outcomes, we recommend:

- **Collect data:**
  - undertake a time series water use survey of data centres to inform setting performance standards for water use.
  - work with industry, the community, ecologists, agriculture sector, and water science experts on water availability on a bioregional basis.
- **Set minimum water performance standards** for data centre cooling equipment that tighten over time, and consider adapting existing standards for data centre equipment.
- **Publish data:** require data centres to publish water use data regularly with frequency increasing during heat wave events and declared droughts.

Hardware Waste

An important but frequently overlooked dimension of data centre sustainability is how hardware waste is managed. Data centres generate large volumes of end-of-life equipment such as servers, networking hardware, cooling systems, batteries and increasingly solar panels and other renewable energy assets. As data centre capacity in NSW grows rapidly, so too will the volume of waste hardware requiring responsible end-of-life management.

Currently, most of this e-waste is exported, landfilled or managed through informal channels. This means Australia is losing large amounts of valuable materials including rare earth metals, copper and aluminium, which could be reused to grow a clean Australian manufacturing base. Also, mismanagement of these hazardous materials risks environmental damage and human health.

We recommend the NSW Government establish minimum standards for the responsible management, reuse and recycling of data centre hardware waste, consistent with NSW's circular economy objectives and the NSW *Waste Avoidance and Resource Recovery Act 2001*.

Social licence

Engaging early with communities likely to be affected by new developments in their region is critical for ensuring social licence. Broadly speaking, social licence is where a community explicitly or implicitly accepts a new project in their region. Social licence is not a ‘status quo’ but an ongoing acceptance built and maintained through communication, listening, and trust.[29] It also varies temporally and by community profile.

The recommendations proposed above will contribute to building and maintaining social licence. Other measures that can contribute to maintaining social licence include clearly communicating how data centres will affect water resources and energy infrastructure, being honest about likely job opportunities, and investing in the community consistent with their values, needs and identity.

However, the responsibility for laying the groundwork for social licence lies with the government before industry commences project development. It is the role of government to explain and socialise their policy decisions and the role of industry to explain a proposed development.

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[27] Yañez-Barnuevo, M, 2025, Data Centers and Water Consumption, Environmental and Energy Studies Institute, 25 June, 2025

[28] See Footnote 22

[29] Stuart, A et al, 2023, Conceptualising social licence to operate, *Resources Policy*, Volume 85, Part A, August 2023, 103962

Therefore, we ask the NSW Government to start working with communities in areas prioritised or identified as suitable for data centre growth on what the development involves and what the community wants from the development .

Supply chains and workforce planning

Similar to renewable energy delivery, data centre growth and investment will also require skilled workers, materials, global supply chain reliability, and more streamlined regulatory and planning approval processes, for example. To prepare for workforce demands from data centre construction, we recommend the NSW Government should:

- develop and deliver workforce training in communities where data centre growth is expected or zoned for
- updating occupational health and safety provisions and training now will ensure a workforce is ready to work to build and manage data centres.

International models

There are limited international policy models for sustainable data centres and managing data centre growth. Most countries seem to be at similar stages in managing data centre growth using a combination of voluntary and regulatory measures. Some best practice examples the NSW Government could consider are outlined below. Further examples are detailed in the Water Services Association of Australia's 2025 report, *Data centres and water in Australia: A resource for sustainable data centre development*.

Singapore - Data centre energy efficiency standard

Singapore is an attractive location for data centres. However, the climate presents challenges for energy efficient cooling systems. To support data centre growth while also minimising energy demand, the Singapore Government developed a Green Data Centre Roadmap[30] to support growing a sustainable data centre sector. Industry is also supported by Singapore Government funded Green Data Centre Standard, which sets out performance metrics for measuring and tracking data centre sustainability when operating in a tropical climate, as well as best practices for managing electrical, mechanical, and IT equipment, and infrastructure design.

The European Union framework

The European Union introduced mandatory reporting requirements because there was a lack of transparency of data centre energy and water use. Water footprint and energy performance of large data centres is collected and published.[31]

Other industry guidance was also to monitor data centre sustainability performance and to drive improvements. The European Union Code of Conduct for Data Centres is a voluntary and complementary initiative to encourage data centre operators and owners to adopt best practices that reduce energy consumption and promote sustainability[32]. In 2025, best practice guidelines were released to provide more detail on how data centres can improve their sustainability such as through corporate governance measures and technical interventions prioritising energy efficiency.

Currently, the European Commission is working towards establishing a common rating scheme for data centres[33].

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[30] Infocom Media Development Authority, 2024, *Driving a greener digital future: Singapore's green data centre roadmap*, Singaporean Government https://www.imda.gov.sg/-/media/imda/files/how-we-can-help/green-dc-roadmap/green-dc-roadmap.pdf

[31] European Commission, 2024, Energy performance of data centres, Brussels

[32] Acton, M et al, 2025 Best Practice Guidelines for the EU Code of Conduct on Data Centre Energy Efficiency, Publications Office of the European Union, Joint Research Centre, Luxembourg

[33] See Footnote 33.