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9 September 2026

To the Joint Select Committee on Artificial Intelligence,

Climateworks Centre submission to the *Inquiry into Artificial Intelligence*

Climateworks Centre welcomes the opportunity to make a submission to the Joint Select Committee on its inquiry into Artificial Intelligence (AI).

Climateworks bridges the gap between research and climate action, operating as an independent not-for-profit within Monash University. We are climate transition specialists, working with decision-makers who have the power to reduce emissions at scale. Climateworks accelerates ambitious, evidence-based action for net zero in Australia and Southeast Asia.

This submission speaks directly to paragraphs (a), (b) and (f) of the Committee's terms of reference: the opportunities AI presents to lift Australia's resilience, productivity and competitiveness; the opportunities for AI's benefits to be spread across Australia's suburbs and regions; and the importance of data sovereignty and the opportunities presented by narrow, domain-specific AI models trained on Australian data in areas of Australian sectoral expertise. We raise one opportunity that sits squarely within that remit but is not yet part of the national conversation: the potential for AI to accelerate Australia's climate transition, and the current absence of a coordinated plan to realise it.

An overlooked opportunity for Australia's AI ambitions

Government and energy agencies are already using AI to support Australia's transition to net zero. The Australian Energy Market Operator (AEMO) uses machine learning for long-term electricity demand forecasting (AEMO 2024). CSIRO applies AI to real-time water forecasting and carbon ecosystem mapping (Naughtin et al. 2025). The Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) uses AI in its farmpredict model to project climate impacts on farm businesses (ABARES 2025). These are examples of what's possible, but adoption remains patchy, and collaboration across sectors is key (Naughtin et al. 2025).

Advanced modelling capabilities alongside AI, such as Climateworks' own Land Use Trade-Offs model version 2 (LUTO2), developed with Deakin University and with research inputs from CSIRO, illustrate the potential of narrow, domain-specific, Australian-data-trained models described in paragraph (f) of the terms of reference (Climateworks Centre 2024). LUTO2 helps to balance energy, agricultural, water and biodiversity objectives simultaneously, pointing to a genuine sovereign capability in an area of clear Australian sectoral expertise.

The government's recent announcement of Australian Standards for AI and a new Office of AI within the Department of the Prime Minister and Cabinet is a welcome step, bringing data centre location, energy and water obligations into a single national framework for the first time. But Standards that manage AI's risks are only half of the equation. Without an accompanying plan to actively direct AI's capability toward the public good, including decarbonisation, this opportunity risks being left to chance rather than built in by design.

The timing matters. The regulatory architecture for AI is being designed right now, with National Cabinet having recently met to consider the national approach to data centres, and Commonwealth legislation expected in early 2027. If the climate opportunity is not built in from the start, it will be far harder to retrofit later.

Recommendation

Climateworks recommends the Committee's report call on the government to develop a coordinated national plan to direct AI and advanced modelling toward accelerating decarbonisation across the economy – building on and extending the ambition of the National AI Plan (DISR 2025). Such a plan could:

- embed AI applications into Australia's existing sector emissions reduction plans and national climate risk assessment framework, which has already identified 63 nationally significant risks (Australian Climate Service 2025) – rather than treating this as a separate workstream
- strengthen collaboration between government agencies already applying AI to climate and energy challenges
- invest in the capacity of local and state governments, Indigenous and community organisations, research institutes, and regional and rural communities to apply AI tools to climate challenges and adaptation – ensuring the benefits of this capability reach beyond major cities and large technology firms.

This would situate Australia's climate resilience and decarbonisation objectives squarely within its AI ambitions. It would turn an underused capability into a source of productivity gains, regionally-shared benefit and sovereign capability – consistent with the opportunities under paragraphs (a), (b) and (f) of the Committee's terms of reference.

Related submission

Climateworks has also made a submission to the Senate Environment and Communications References Committee's inquiry into Artificial Intelligence and Data Centres, which addresses this recommendation in greater depth alongside the resource, siting and community-benefit considerations raised by data centre growth specifically (Recommendation 2). We have included this submission as an appendix, and would welcome the opportunity to brief the Committee further on our work.

Thank you for the opportunity to contribute to this inquiry.

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APPENDIX: Climateworks Centre submission to the *Artificial Intelligence and Data Centres Inquiry and Report* consultation

26 June 2026

To the Environment and Communications Reference Committee,

Climateworks Centre welcomes the opportunity to provide a submission to the Environment and Communications Reference Committee in response to the *Artificial Intelligence (AI) and Data Centres inquiry and report* consultation.

Climateworks bridges the gap between research and climate action, operating as an independent not-for-profit within Monash University. We are climate transition specialists, working with decision-makers who have the power to reduce emissions at scale. Climateworks accelerates ambitious, evidence-based action for net zero in Australia and Southeast Asia.

Australia is at the threshold of a significant expansion in AI and the data centre infrastructure that supports it. This could lead to productivity gains, new industries and changes in the labour market, along with economic opportunities. It will also place new pressures on the resources that underpin the country's transition to net zero, including electricity, land and water.

AI and data centres are best considered as part of Australia's broader economic and decarbonisation efforts. Like the industry, cities and land sectors, they present challenges and opportunities spanning energy planning, precinct development, land use, transition planning, investment attraction and social license. The decisions governments make now about their siting, design, flexibility and energy sourcing could determine whether they reinforce or undermine Australia's net zero objectives.

Managed well, AI and data centres could make an important contribution to Australia's climate transition and economic outlook. With the right technologies, AI and data centres are large and controllable loads that can provide demand flexibility, helping to firm renewable energy, reduce reliance on gas peakers and defer network infrastructure investment. Sited well, they could support new energy infrastructure and attract investment to the regions that host them. AI technologies themselves present significant potential to accelerate decarbonisation across energy, industry, transport, buildings and land use (Noble et al. 2023).

The pace at which AI is being deployed and data centres are being developed means there is a limited window to shape and secure these outcomes. The recommendations in this submission set out how governments and companies can integrate AI and data centres into decarbonisation strategies, secure additional renewable energy supply and demand flexibility, set and comply with appropriate energy and water efficiency standards, direct investment towards locations with spare network capacity, coordinate energy and land use decisions, and ensure host communities have genuine input into decisions and share in the benefits. Together, they outline an approach that would allow AI and data centres to expand in the Australian market while supporting the broader decarbonisation effort, protecting resources, centring the interests of communities and ensuring ongoing benefit for the nation.

Submission summary

Climateworks suggests the Environment and Communications Reference Committee's report calls on the Australian Government to:

- Expect or require data centre operators, AI companies and their investors to use the tools in the Sustainable Finance Roadmap, including credible transition plans.
- Develop a plan to invest in and use AI and advanced modelling to accelerate decarbonisation

across the economy, including the energy and electricity, buildings, transport, industry and land use sectors.

- Ensure data centres do not slow the energy transition by assessing how much additional demand the electricity system can accommodate alongside the increasing demand from transport, buildings and industry and how data centres can contribute through demand flexibility and additional renewable energy supply.

- Assess data centres' capacity to provide demand flexibility services, and the market settings that would best incentivise their participation, taking into account the differences between the National Electricity Market (NEM) and Wholesale Electricity Market (WEM).

- Set mandatory energy and water efficiency standards for data centres, with a 6-star National Australian Built Environment Rating System (NABERS) rating as the benchmark, to minimise demand growth.

- Explore how clearer incentives and information about where to build data centres could guide investment towards regions that have spare capacity and grid connection infrastructure.

- Coordinate the siting of data centres and their supporting energy infrastructure with government land-use planning, so that the best available information on biodiversity, agricultural, water, cultural, industrial and community values shapes decisions, with a view to a comprehensive national land-use framework over time.

- Integrate data centre growth into both strategic precinct-level planning and operational frameworks, ensuring that new and existing developments safeguard climate and environmental integrity, undertake genuine community consultation, and deliver tangible benefits for households, local industries and impacted communities.

Recommendations

Recommendation 1: Expect or require data centre operators, AI companies and their investors to use the tools in the Sustainable Finance Roadmap, including credible transition plans.

AI and data centres can deliver significant productivity and economic benefit for Australia, creating new jobs and industries and accelerating commercial and industrial processes and innovation. They will also draw heavily on Australia's resources, placing significant new demands on the electricity grid, water supplies and land. The technology companies that depend on those resources stand to benefit significantly from establishing and expanding their Australian operations. Given their transformative impact and the demand they will place on national resources, it is appropriate to expect that AI companies and data centre operators ensure their presence delivers lasting benefits for society, the economy and nature.

This includes ensuring AI companies and data centre operators credibly pursue net zero emissions. The Sustainable Finance Roadmap (Treasury 2024) sets out priorities to support this, including support for credible transition planning, climate-related financial disclosures and the Sustainable Finance Taxonomy. Together, these tools will help companies reduce emissions, manage climate-related risks and opportunities, guard against greenwashing and improve transparency for investors.

Climateworks recommends that the Committee propose that the government consider how it could influence or require AI companies and data centre operators to adopt credible transition plans, irrespective of their current statutory obligations.

Where AI companies or data centre operators enter into formal agreements with the government, it is appropriate to expect high corporate standards. These agreements, which could include Memorandums of Understanding (MoU) to deliver the National AI Plan (DISR 2025) or arrangements in which the government is the customer, could be leveraged to expect companies and investors to adopt credible transition plans on an 'if not why not' basis.

Where AI companies or data centre operators do not have a formal agreement with government, but require regulatory approval to proceed, such as foreign investment or grid connection approval, the expectation that they adopt credible transition plans could be incorporated in the government's *Expectations of data centres and AI infrastructure developers* (DISR 2026). The government could then continue, as it does now, to prioritise approvals for developments that demonstrate a genuine commitment to that framework.

The content of their credible transition plans need not be limited to climate outcomes. Treasury's recent consultation on its upcoming Climate-related Transition Planning Guidance suggests it will adopt a 'climate first but not only' principle, supporting the inclusion of social and nature outcomes in credible transition plans alongside climate (Treasury 2025). This is relevant to data centres, which can also have significant impacts on water supply, land use and host communities. Climateworks suggests that credible transition plans prepared by data centre operators and AI companies be required to reflect these considerations, consistent with the government's own guidance.

The benefits of AI companies and data centre operators adopting credible transition plans would extend beyond their facilities. As large and well-resourced actors, the climate, social and nature standards they set could lift expectations of what can be achieved by major new developments across the economy. Furthermore, their extensive supply chains mean expectations placed on AI companies and data centre operators would flow through to suppliers across the value chain.

Finally, the inquiry has an opportunity to extend the expectation for credible transition plans beyond AI companies and data centre operators, signalling to the investors and financiers backing these facilities that they could treat such plans as a criterion for investment. Given the volume of capital flowing into the sector, these investors have an important role and responsibility in the transition. Treating credible transition plans as an investment criterion would reinforce the sector's commitment to decarbonisation, alongside social and nature outcomes. It would also strengthen Australia's sustainable finance ecosystem and its reputation as a location for net zero–aligned investment.

Recommendation 2: Develop a plan to invest in and use AI and advanced modelling to accelerate decarbonisation across the economy, including the energy and electricity, buildings, transport, industry and land use sectors.

The same AI systems driving demand growth in Australia's data centres could also help accelerate the transition to net zero – but only if governments intentionally direct them toward that purpose. Australian government and energy governance agencies already apply AI tools and advanced modelling to the climate and energy transition. The Australian Energy Market Operator (AEMO) uses machine learning in its long-term demand forecasting (AEMO 2024). CSIRO applies it to climate challenges, including real-time water forecasting and carbon ecosystem mapping (Naughtin et al. 2025). The Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) draws on it in its farmpredict model to forecast farm business outcomes and assess the impacts of climate change on agriculture (ABARES 2025).

The application of AI to climate challenges in Australia has not yet achieved widespread adoption, and there is potential for greater collaboration between sectors (Naughtin et al. 2025). Australia's *National AI Plan*, released in December 2025, sets out the government's ambition to harness AI for economic and social benefit. However, it does not establish a coordinated program to direct AI toward

decarbonisation goals (DISR 2025). This creates a gap between Australia's AI ambitions and its climate objectives. The scale of AI and data investment now flowing into Australia means there is a time-limited opportunity to address that gap, and to do so in partnership with the technology companies driving that investment, including through expectations and agreements that harness their expertise and data for public climate purposes.

Australia's sector emissions reduction plans (DCCEEW 2025), which cover electricity and energy, industry, resources, transport, agriculture and land, and the built environment – together with other national net zero policy frameworks and strategies – could provide a foundation for systematically embedding AI into national decarbonisation action. For example, *Australia's National Climate Risk Assessment*, released in September 2025, identifies 63 nationally significant risks and illustrates both the scale of the challenge and the opportunity for AI to help meet it (Australian Climate Service 2025). Rather than waiting for the next national assessment cycle, AI tools could continuously update risk models as new climate data emerges, helping governments, regulators and communities translate national-level evidence into the place-based action that effective climate preparedness requires.

Across each of Australia's key economic sectors, potential applications of AI include:

- Energy and electricity: AI could improve both demand forecasting and grid management across Australia's electricity system. More accurate forecasting is essential for grid stability and avoiding costly infrastructure overbuild or undersupply. AI can also improve the forecasting and integration of variable renewable generation, reduce curtailment and help grid operators take advantage of existing network assets. The International Energy Agency (IEA) finds that AI-based fault detection can reduce outage durations by 30 to 50 per cent, and that remote sensors combined with AI management could unlock additional transmission capacity without new infrastructure (IEA 2025). In the Australian context, AEMO's Optimal Development Path estimates that 6,000 kilometres of new transmission lines will need to be built by 2050 (AEMO 2025a). AI-assisted grid management could ease that pressure by reducing peak demand through smart system management, reducing new transmission requirements and optimising the routing of new infrastructure to avoid sensitive land, thereby reducing delays and costs.

- Buildings: Buildings account for around 30 per cent of global final energy use, making the sector a significant target for AI-led efficiency gains (Dahlan and Mahmud 2026). New-generation building energy management systems powered by AI can draw on a much wider range of data, including occupancy patterns, weather forecasts and electricity prices, to optimise heating, ventilation and air-conditioning (HVAC) controls more accurately and frequently than legacy systems. Real-world deployments have demonstrated savings of 10 to 30 per cent in heating and cooling energy use across commercial buildings (IEA 2025). The IEA estimates that broad uptake of these tools could reduce global electricity demand for heating and cooling by around 5 per cent by 2035. In advanced economies, including Australia, over half of commercial floorspace is already equipped with automated HVAC controls that could be upgraded to AI-enabled systems with limited additional hardware investment. These gains are amplified in electrified buildings, where AI management systems can respond dynamically to grid signals and electricity prices in ways that gas-reliant systems cannot. Realising that potential will require deliberate policy direction rather than market uptake alone.

- Transport: Deploying existing AI applications across the transport sector worldwide could save the equivalent of the annual energy consumption of around 120 million cars by 2035 (IEA 2025). For road freight, AI-based route optimisation, smarter load management and predictive maintenance have been shown to reduce fuel consumption by up to 15 per cent. In aviation and shipping, AI-assisted route and voyage optimisation can reduce fuel

consumption by 10 to 12 per cent per journey. Rail shows the highest relative potential, with AI-led operational optimisation capable of reducing energy demand by up to 20 per cent (IEA 2025). These gains are particularly relevant to Australia given the emissions intensity of its freight and aviation sectors and the long-distance nature of its supply chains.

- Industry: The industrial sector is one of the largest consumers of energy and sources of emissions globally. The IEA estimates that broad deployment of existing AI tools could reduce global industrial energy demand by around 8 exajoules by 2035 – the equivalent of Mexico's total annual energy consumption (IEA 2025). In energy-intensive industries such as steel, cement and chemicals, AI-driven process optimisation can deliver efficiency improvements of 2 to 6 per cent, with costs typically recovered within two years. In lighter manufacturing, cases of whole-of-factory AI deployments have reduced energy intensity by 25 to 42 per cent globally (IEA 2025). However, globally, fewer than one in five industrial companies have adopted AI tools to date, suggesting the bulk of this potential remains untapped. This represents a significant opportunity for policy to enhance uptake and accelerate decarbonisation in Australia's own industrial base (IEA 2025).

- Land use: AI-assisted spatial modelling has significant potential to identify and balance competing demands between energy infrastructure, biodiversity, agriculture, water and cultural heritage – helping governments make better-informed land-use decisions. Tools such as Climateworks' Land Use Trade-Offs (LUTO2) model, developed with Deakin University and with research inputs from CSIRO, demonstrate what this can look like in practice (Climateworks Centre 2024). The broader application of AI to land-use trade-off mapping is addressed in Recommendation 7 of this submission. The 2026–27 Budget allocates $105.9 million to the Department of Climate Change, Energy, Environment and Water (DCCEEW) and the new National Environment Protection Agency to modernise environmental data and digital systems using AI, with a view to speeding up environmental approvals. This provides a foundation for the kind of AI-assisted land-use trade-off mapping described here (DCCEEW 2026a).

Operationalising these potential applications requires foundational enablers. AI itself can serve as an enabler, making climate and energy data more accessible and reliable for public institutions and civil society. This approach could improve transparency, build trust and strengthen the democratic legitimacy of climate decision-making, while providing the independent data required to hold companies accountable to their claims.

By way of example, while mandatory climate-related financial disclosures now require large entities to report on emissions and climate-related risks (Treasury 2024), the quality and verifiability of this disclosure framework hinges on the underlying monitoring capabilities of governments and regulators. Expanding the use and sharing of AI-assisted data and compliance tools across agencies, like the Australian Securities and Investment Commission (ASIC) and the Clean Energy Regulator (CER), could significantly improve their capacity to verify the accuracy and reliability of reported corporate emissions data. Large data centres are likely captured by the National Greenhouse and Energy Reporting (NGERS) reporting obligations, meaning the CER is already receiving their emissions and energy data – making it a natural place to deploy AI-assisted verification tools that could improve the quality and reliability of that reporting.

Without intentional direction, the analytical tools needed to manage the climate and energy transition will remain concentrated in the technology companies driving this rollout rather than in the public institutions responsible for managing it.

Climateworks advises that the recommended plan capture:

- What a comprehensive approach to embedding AI into existing national decarbonisation strategies could entail, including Australia's sector emissions reduction plans and the National Climate Risk Assessment framework – building on and extending the ambition of the *National AI Plan* (DISR 2025).
- Strengthened collaboration between government agencies on AI applications for decarbonisation, including the energy and electricity, buildings, transport, industry and land use sectors.
- Investment in the capacity of entities, such as local and state governments, Indigenous and community organisations, research institutes, rural and regional communities and land managers to apply AI tools to climate challenges and adaptation.
- How the government's *Expectations of data centres and AI infrastructure developers*, and any formal agreements forged with them, could be extended, building on recent federal budget investments to modernise environmental data and digital systems through AI (DISR 2026). Specifically, this could include technical collaboration with Australian public research institutions to co-develop AI applications for climate purposes.

Recommendation 3: Ensure data centres do not slow the energy transition by assessing how much additional demand the electricity system can accommodate alongside the increasing demand from transport, buildings and industry and how data centres can contribute through demand flexibility and additional renewable energy supply.

Data centre deployment in Australia could be rapid. In the 2025 financial year, they are estimated to have consumed 3.9 terawatt hours (TWh) of electricity, with 98 per cent drawn from the grid, accounting for about 2 per cent of total electricity consumption. Under AEMO's current 'Step Change' scenario, data centre consumption is forecast to grow at an average annual rate of 25.1 per cent to reach 12 TWh by 2030 and 34.5 TWh by 2050 (Oxford Economics 2025a). This expansion could occur at the same time as the electrification of transport, buildings and industry.

However, the scale and timing of data centre demand remain uncertain. AEMO has applied a 40 per cent error margin to its forecasts (Palmer 2025), and Oxford Economics found 6 in every 7 megawatts (MW) of connection requests are 'phantom demand' – that is, they are not expected to materialise under AEMO's 'Step Change' scenario. That means that of the 44 gigawatts (GW) of data centre network requests received from network service providers, only 6 GW of capacity is needed to meet demand (Oxford Economics 2025b).

There is risk at both ends of the spectrum. Overestimating demand could mean unnecessary infrastructure build, paid for by consumers. Underestimating it could mean system reliability failures and price spikes that harm households and industry. Governments and energy market bodies therefore need to carefully assess how much additional electricity demand will be placed on the system, as well as how much it can accommodate, where, and over what timeframe.

The consequences of poor management will impact both consumers and the climate. If data centre growth is not matched with new renewable generation and storage, wholesale electricity prices could increase by more than 20 per cent by 2035. Furthermore, there would be greater reliance on gas-powered generation, and the lifespan of coal and gas generators could be extended, undermining Australia's pursuit of its net zero objectives (Climate Council 2026).

If their growth is well managed, however, data centres can make an important contribution to Australia's net zero transition. That can be achieved in two ways. First, data centres can be incentivised to provide demand flexibility through the mechanisms outlined in Recommendation 4. Second, the government could establish requirements that data centres match their electricity demand with new renewable electricity generation and storage.

Data centres can source their electricity either from on-site generation and storage, through power purchase agreements (PPAs) or from the wholesale market. Climateworks suggests:

- Where electricity is sourced on-site, require that generation and storage infrastructure be renewables only.
- Where electricity is sourced through a PPA, require that agreements are for renewable electricity only.
- Where electricity is sourced from the grid, require consumption be matched with electricity from renewable facilities constructed within an appropriate timeframe determined by the CER. The timeframe would balance additionality with the long-term offtake certainty that renewable developers need to reach financial close. Matching would be certified through the Renewable Electricity Guarantee of Origin Scheme (CER 2026).

A requirement for data centres to source their electricity from renewables raises the question of why such an obligation should apply to data centres and not other industrial and commercial users. Climateworks would support applying the same requirement across the economy. That said, the potentially transformative scale and pace of AI and data centre impacts across society, including on electricity demand, combined with the magnitude of profit international technology companies stand to realise, justifies this action.

We note that some existing data centres, including the NextDC facility in Melbourne's inner west (Lucas 2026), have installed on-site diesel backup generators. This is inconsistent with Australia's net zero objectives. Climateworks suggests that planning approvals, licensing conditions, or specific legislative obligations require those facilities to transition to renewable backup alternatives, consistent with the requirements set out above and within a defined timeframe. Furthermore, the full extent of diesel backup infrastructure across the sector is not publicly reported and warrants disclosure requirements.

Recommendation 4: Assess data centres' capacity to provide demand flexibility services, and the market settings that would best incentivise their participation, taking into account the differences between the NEM and WEM.

Data centres are large electricity loads whose scale makes even modest demand flexibility valuable. In Australia, there is limited evidence that they participate in demand flexibility at scale. However, with the right technologies and appropriate market settings, data centres have the potential to help balance electricity supply and demand, reduce pressure on the grid and lower system costs and carbon emissions.

The scale of their loads is significant. Australia's largest proposed data centre, the Mamre Road campus at Kemps Creek in Western Sydney, would have a power capacity of 1.2 GW (Williams 2026). Individual hyperscale facilities already under construction are consistently in the hundreds of MW (Jackson 2026). By comparison, Australia's largest power station, Eraring, has a capacity of 2.9 GW across its four coal-fired power units (Origin Energy 2026).

Data centres could provide flexibility in several ways. Those include shifting computation that is not time critical, enhancing thermal design and drawing on on-site battery storage:

- Shifting computation: While many computational processes are difficult to curtail due to the significant consequences of interruption on commercial outcomes and customers, many others can tolerate latency without impacting performance or user experience. These include big data analytics, data compaction, machine learning, backup and data archiving, batch processing, video processing pipelines, software updates, scientific simulations, rendering, email and file transfer services, and various background tasks. The modular design of data

centres, combined with the time flexibility and predictability of workloads, means a range of computational tasks could be coordinated around grid conditions (Takci et al. 2025).

- Enhanced thermal design: There are several ways to shift cooling loads, including pre-cooling ahead of periods of high demand, operating across a wider temperature range during periods of high demand and drawing on thermal energy storage, such as water cooling tanks, that are charged during off-peak periods (Takci et al. 2025). Furthermore, the inertia of data centres allows cooling loads to be reduced for short periods without impacting computation (Khojaste et al. 2025).

- On-site battery storage: The most reliable source of demand flexibility could come from the very large batteries some data centre facilities install for backup and reliability. Because these assets are designed to handle the full load of the data centre, they allow the operator to reduce reliance on the grid during peak periods and recharge when electricity prices fall and renewable output is high (Takci et al. 2025). To illustrate the scale, the Supernode Data Centre in Brendale, Queensland, will integrate four hyperscale data centres with what will be Australia's largest battery system, totalling 770 MW and 2,900 megawatt hours (MWh). This scale suggests a single data centre could provide demand flexibility to the grid at utility scale (Macgregor et al. 2025).

There are examples from across the world of data centres providing demand-flexibility services. Nebius' AI factory in London demonstrated that it could reduce power consumption by 30 per cent in under 40 seconds and modulate its load in inverse correlation to residential demand spikes (Williams et al. 2026). Google has developed a system for Carbon-Intelligent Compute Management, which minimises the carbon footprint of data centres by delaying flexible workloads (Radovanovic 2021), and is currently using the system in five US facilities (Wittenberg 2026). Microsoft's Dublin data centre has deployed a grid-interactive uninterruptible power supply that allows its backup batteries to provide fast frequency response to the Irish grid without compromising computation (Craske 2026).

In Australia, the government's *Expectations of data centres and AI infrastructure developers* already includes an obligation that they provide demand flexibility and peak-load management (DISR 2026). Climateworks supports this expectation and recommends governments consider whether it warrants formalisation as a requirement, including ensuring data centres adopt the technologies required for demand flexibility.

For the existing expectation to be met, the market will need to appropriately reward data centres for participating in demand flexibility. Climateworks recommends governments and energy governance bodies consider the market settings and incentives that could enable data centres to participate in electricity spot markets, taking into account the differences between the NEM and WEM.

In the NEM, two mechanisms provide pathways for data centre demand response. The Wholesale Demand Response Mechanism (WDRM) allows facilities capable of exporting more than 5 MW to register as Wholesale Demand Response Units and export to the market or power down non-essential loads during periods of high electricity prices and supply scarcity (AEMO 2026a). The WDRM could suit large data centre battery loads; however, its baseline methodology could be difficult to apply given the high variability of computational and thermal loads. The Integrated Price Responsive Resources (IPRR) mechanism, scheduled for implementation in 2027 (subject to Australian Energy Market Commission [AEMC] rule change processes), could offer a more appropriate pathway. Its voluntary 'dispatch mode' will integrate unscheduled price-responsive resources into the NEM spot market, allowing providers such as data centres to separate flexible loads, including batteries, computing and cooling, from inflexible loads (AEMO 2026b).

The WEM operates differently, with Western Australia having adopted a capacity market. The Reserve Capacity Mechanism (RCM) awards tradable Capacity Credits for capacity made available to maintain reliability during periods of peak demand, and allows demand-side resources to participate by curtailing loads or discharging storage at those times (AEMO 2026c).

Unlocking data centre flexibility would support system reliability and defer or avoid investment in gas peaking generation and network capacity, reducing costs for consumers and carbon emissions. Those benefits will only be realised if market frameworks are intentionally designed to encourage participation. Climateworks recommends:

- Governments analyse the capacity of data centres to contribute to demand flexibility, and consider formally requiring them to participate and to install the necessary technologies.
- Governments and market bodies ensure tariffs, market access and system planning are designed to incentivise participation in demand flexibility.
- The AEMC and AEMO assess the settings of the WDRM and IPRR frameworks to ensure they optimise data centre participation in the wholesale market through demand flexibility.
- Energy Policy WA and AEMO consider how the RCM can best incentivise data centre demand flexibility in the WEM.

Recommendation 5: Set mandatory energy and water efficiency standards for data centres, with a 6-star NABERS rating as the benchmark, to minimise demand growth.

Data centres are among Australia's fastest-growing sources of new electricity and water demand. The resources each facility requires vary depending on how it is designed and operated. Efficiency standards will help ensure this growth is met in a way that supports national energy and net zero objectives.

Electricity demand from data centres could be 12 TWh by 2030 and 34.5 TWh by 2050 (Oxford Economics 2025). Computing is the largest single source of data centres' electricity consumption, accounting for around 60 per cent, though this can vary significantly. A facility's efficiency significantly affects its electricity use – the share of electricity used for cooling ranges from around 7 per cent in efficient hyperscale facilities to more than 30 per cent in less efficient facilities (IEA 2025).

There are three categories for improving computational energy efficiency: the hardware, how fully that hardware is utilised, and the software. Purpose-built AI chips deliver significantly more computing power per unit of energy compared to older equipment, and even than modern processors. Data centre servers frequently run below their capacity, sometimes at only 20 to 30 per cent (Clifford 2022), and even when idle, they continue to draw a significant proportion of the power they would use at full capacity. Optimising hardware and its utilisation, including consolidating workloads, upgrading equipment and turning off redundant servers, could reduce energy consumption by up to around 20 per cent (IEA 2025). Finally, enhancing the software and scheduling that determines how hard the hardware works could reduce the energy required for a given computing output (Stackpole 2025).

After computing, cooling is the second largest source of electricity consumption (IEA 2025). Several opportunities exist to improve cooling efficiency, including hot/cold aisle containment, using outside air to supplement mechanical cooling, adopting liquid cooling, replacing legacy fans, and optimising coil design, heat exchange and valve selection (Barrango 2025). These measures would also reduce water lost to evaporative cooling, concurrently helping address water consumption concerns.

The potential impact of data centres on Australia's water supply also warrants close attention. Cooling can require significant quantities of water. The amount depends heavily on the type and efficiency of the system used. A medium-sized data centre could consume up to 416 million litres of water a year, and a larger facility could use around 19 million litres a day (Yanez-Barnuevo 2025). Sydney Water

projects that by 2035, data centres could consume up to a quarter of the city's available water, or around 135 gigalitres (Kaye 2025). This makes water a central consideration both in the design of any water efficiency standards and in the siting of data centres and their energy infrastructure, as outlined in Recommendation 7.

There are a range of measures that can reduce data centres' water consumption. Adopting a metric, such as Water Usage Effectiveness, that compares water used for cooling against computational processes, would make consumption visible and allow improvements to be measured (Higgins 2024). Closed-loop systems that recirculate water rather than evaporating it have delivered freshwater savings of 50 to 70 per cent (Spidler et al. 2024). Air-cooled designs, along with direct-to-chip and immersion liquid cooling, substantially reduce a facility's reliance on water (Campbell 2025). Microsoft has even designed a cooling system that requires filling once, during construction, and then uses no further fresh water (Solomon 2024). Where water is still required, sourcing it from recycled wastewater or harvested rainwater would relieve the pressure on potable water (Campbell 2025).

NABERS already provides the basis for energy-efficiency standards and will soon provide water-efficiency standards. It currently rates the energy efficiency of data centres across three streams, including IT equipment, supporting infrastructure and the facility as a whole (NABERS 2026). It does not yet provide an equivalent water-efficiency rating; however, it has secured funding to develop a national water-efficiency framework for data centres and expects to have completed that work by October 2026 (Francis 2026).

Climateworks recommends that new data centres be required to meet a 6-star NABERS rating under both the energy and water frameworks. The 6-star standard is achievable, is already incorporated into government policy, and can be regulated through planning approvals.

In the 2023–24 budget, the government committed to extending the Clean Building Management Investment Trust withholding tax to data centres and increasing the qualifying threshold for that concession to 6-star NABERS (BDO Australia 2025). Under that policy, foreign investors whose data centres meet the standard pay a concessional 10 per cent withholding rate, rather than the standard 15 per cent (ATO 2020). Given the substantial resource requirements of data centres, and the fact that most are new builds that can be designed efficiently from the outset, Climateworks recommends making the 6-star NABERS standard mandatory, rather than an optional benefit via a tax concession.

Climateworks also supports the inclusion of data centres in the National Energy Performance Strategy, and any further policies designed to improve their energy performance in updates to that strategy (DCCEEW 2024a).

Recommendation 6: Explore how clearer incentives and information about where to build data centres could guide investment towards regions that have spare capacity and grid connection infrastructure.

Australia currently hosts more than 250 data centres, with 80 per cent of those concentrated in metropolitan areas of Melbourne and Sydney. Data centre operators and AI companies prefer these locations for their proximity to skilled workforces, low latency and fibre connectivity (Lim 2026). That concentration is now colliding with grid capacity and connection restraints. Several Sydney developments have been delayed due to insufficient NEM capacity, and Transgrid data centre connection applications have exceeded the capacity that will become available through the first stage of the Central-West Orana Renewable Energy Zone (REZ) (Camenzuli and North 2026; Climate Council 2026).

The location of data centres impacts how much energy generation, storage and transmission must be built, how quickly and easily facilities can connect, and the expense to both investors and

communities. As it stands, while AEMO does publish the *Enhanced Locational Information Report* (AEMO 2025b), data centre operators and AI companies continue to select sites without due regard for network capacity and connection constraints, and with limited impetus to consider sites outside of metropolitan Melbourne and Sydney.

Guiding data centres to regions with spare capacity and abundant renewable resources would reduce network congestion in constrained locations, defer or avoid expensive network upgrades paid for by consumers, and make use of renewable energy that might otherwise be curtailed.

One approach that warrants consideration is incorporating data centres within proposed industrial clusters, or 'net zero industrial precincts' (NZIPs), and accommodating them through improved planning in those locations, including the development of Industrial Area Energy Plans (IAEPs). Under an NZIP approach, industrial centres have access to the renewable generation, storage and transmission that could support them. Climateworks supports the development of IAEPs for those regions, setting out in detail expected energy demand and supply-side infrastructure requirements. Those plans could be used to guide data centres to locations with suitable capacity and grid connectivity.

Communities in both industrial regions and urban centres would benefit from the government weighing the trade-offs involved in hosting data centres. On one hand, data centres could act as anchor tenants that attract other businesses and serve as offtakers in regions where renewables are abundant. Data centres themselves have argued they could catalyse REZ developments, including by underwriting generation infrastructure (Palmer 2026). There is emerging evidence of this dynamic in the United States, where hyperscale data centres in rural Virginia and Texas have supported local grid investment and employment (Mural et al. 2026), though the applicability of those conditions to Australian regions warrants assessment. On the other hand, in locations where renewables, network capacity and water are limited, data centres risk competing with the electrification of industry, transport and buildings and slowing decarbonisation in those sectors.

To ensure trade-offs are comprehensively considered, and data centres are guided towards regions with appropriate grid capacity and connectivity, Climateworks suggests:

- AEMO or state governments publish up-to-date information on network capacity, connection timeframes and renewable energy availability in different regions, with specific guidance for data centre connections.
- State governments develop IAEPs for key industrial regions and use them to identify where data centres can be co-located with industrial facilities undergoing electrification.
- Energy governance bodies and state governments ensure network connection processes and pricing reflect the costs and benefits of large new loads and account for their impact on the wider system.
- The federal government incorporates locational guidance into its *Expectations of data centres and AI infrastructure developers* (DISR 2026) and any MoUs entered into with data centre operators and AI companies to deliver the National AI Plan (DISR 2025).

These measures would be best designed in a way that is consistent with the land-use trade-off considerations outlined in Recommendation 7, ensuring locational guidance balances energy infrastructure against biodiversity, agriculture, water and heritage requirements (Climateworks Centre 2025). More broadly, Climateworks supports the AEMC draft decision to improve the NEM access standards for large loads such as data centres (AEMC 2026), which would establish clearer technical connection requirements and help to improve system security and keep costs down for consumers.

Recommendation 7: Coordinate the siting of data centres and their supporting energy infrastructure with government land-use planning, so that the best available information on

biodiversity, agricultural, water, cultural, industrial and community values shapes decisions, with a view to a comprehensive national land-use framework over time.

If data centres in Australia expand at the pace forecasted (Oxford Economics 2025a), they will require significant new generation, storage and transmission infrastructure, all of which occupy land. Without careful planning, this could compound existing tension between the land needed for renewable energy infrastructure and other uses, including carbon sequestration, biodiversity, agriculture, water catchments, sites of cultural significance, industry and communities.

Climateworks' *Australia's Land Use Future* report shows that the nation's current land-use planning and approval systems are not optimised for the land use changes that decarbonisation brings, including the land use impacts of data centres and their energy infrastructure. Decision-making is fragmented across sectors and jurisdictions, which risks unintended trade-offs and a disorderly transition for land-holders and communities (Climateworks Centre 2026).

Energy infrastructure siting processes are a prime example. AEMO currently draws on various publicly available land-use datasets and modelling to guide the siting of energy infrastructure. However, under the Australia Energy Regulator (AER) Cost-Benefit Analysis Guidelines, AEMO is required to exclude the costs of environmental harm that is not prohibited by law, and to exclude qualitative social impacts from cost-benefit calculations (AER 2024).

This exclusion exists for sound reasons. AEMO is not designed to have the systems, expertise, authority and democratic accountability to determine which land has high ecological value, because such determinations fall outside its obligations under the National Energy Objectives. Responsibility for identifying and protecting areas of high biodiversity, agricultural, water, cultural, industrial and community value appropriately sits with governments.

The challenge, however, is that AEMO's planning currently operates in relative isolation from the government agencies that hold this expertise and responsibility. AEMO only deprioritises a site once the land has been formally designated as a national park, conservation area or significant landscape through land-use planning and zoning processes. Where the government has not yet protected land of high ecological value, or designated land as a priority for restoration under Australia's Strategy for Nature (DCCEEW 2024b), that value is largely invisible to AEMO's planning.

The result is a planning framework in which energy infrastructure siting decisions are made without the benefit of the best available knowledge from government and research institutions about land-use trade-offs. The separation between AEMO and government constrains the quality of inputs available to AEMO's land assessments, while the exclusion of environmental and social considerations from cost-benefit analyses means that trade-offs and synergies between biodiversity, agricultural, water, cultural, industrial and community objectives are not fully optimised.

As the energy transition accelerates, the impact of energy infrastructure siting decisions on alternative land uses will increasingly depend on how closely governments and AEMO work together. Closer coordination could allow the best available land-use information to shape siting decisions so that the trade-offs between energy, biodiversity, agricultural, water, cultural, industrial and community objectives are more fully optimised.

Fragmentation is a fundamental challenge across Australia’s land-use planning and approval systems, and addressing it requires a more integrated and system-level approach. In its *Australia's Land Use Future* report, Climateworks supports establishing a national land-use framework that delivers greater coherence in how the nation plans for landscape change. Such a framework could coordinate policy and planning across sectors and jurisdictions and integrate climate, biodiversity,

agriculture, water, community and energy requirements. It would not seek to direct individual land use decisions. It would instead establish a shared evidence base that clarifies the trade-offs Australia faces and supports more coordinated decision-making (Climateworks Centre 2026).

Spatial scenario modelling could be a key tool for building this shared evidence base. The LUTO2 model is a sophisticated open-source planning tool that identifies how best to manage land to meet climate, energy, biodiversity, agricultural production and water yield objectives simultaneously (Climateworks Centre 2024). In energy planning, it could help identify opportunities to balance critical ecosystems, productive agricultural land and water use early, helping to ensure that infrastructure siting decisions minimise risk. Surfacing trade-offs and synergies sooner could also help avoid energy infrastructure delays, contested approvals and the erosion of community support.

Data centres have the potential to add significant new demand to a system already facing land use pressures, making closer coordination between AEMO and government more pressing. Climateworks recommends that AEMO and government work together so the best available land-use information shapes energy infrastructure siting decisions, and that Australia ultimately considers a comprehensive national framework that integrates energy with other land-use requirements.

Recommendation 8: Integrate data centre growth into both strategic precinct-level planning and operational frameworks, ensuring that new and existing developments safeguard climate and environmental integrity, undertake genuine community consultation, and deliver tangible benefits for households, local industries and impacted communities.

Data centres are significant pieces of infrastructure with meaningful and lasting impacts on the communities that host them. In metropolitan areas, these impacts can include heat, noise and cumulative strain on shared resources, including water mains and electricity networks. In regional areas, they can include large spatial footprints, pressure on agricultural land, biodiversity and water catchments, and significant social and economic consequences for areas that may have limited services and institutions needed to manage them. These impacts warrant genuine community consultation and enforceable standards, in addition to aspirational expectations.

The federal government's *Expectations of data centres and AI infrastructure developers* establish that proposals not aligned with community benefit principles will not be prioritised by Commonwealth regulatory assessments (DISR 2026). This is an important signal. However, it does not require operators to demonstrate that consultation has been genuine, that community concerns have been addressed, that communities have had a genuine opportunity to contribute to project design where appropriate, or that tangible benefits have been delivered. As the scale and pace of data centre development accelerates, the gap between what is expected and what is enforceable will become increasingly material for the communities most directly affected.

Governments have access to levers with different degrees of control to influence these projects. For example, State Significant Development (SSD) assessment requirements give the NSW state government direct authority over whether and how a project may be built on a particular site, and state planning conditions are already routinely used to secure community infrastructure contributions and environmental mitigation as part of major project approvals. Embedding consultation requirements and benefit-sharing obligations into SSDs would extend that established practice to data centres specifically, without creating a new approval mechanism. The foreign investment screening process – under which the Foreign Investment Review Board (FIRB) advises the Treasurer and Government on national interest implications – offers a complementary, though less direct, lever. The Government's 2026 foreign investment reforms will expand the Treasurer's ability to impose more effective and flexible conditions on medium- and high-risk transactions, including conditions that apply before, at, or after an acquisition (Treasury 2026). Given the scale of capital typically involved in data centre and AI infrastructure investment, and the prospect of these sectors being captured by expanded

sensitive-sector notification requirements currently under consultation, this strengthened power to impose conditions could provide another mechanism for incorporating community benefit and consultation commitments into foreign investment approvals.

These mechanisms could build on Recommendation 1, which proposes that government create an expectation or requirement for data centre operators and AI companies to adopt credible transition plans. Such plans are not currently mandatory; some operators may already produce them voluntarily, including where investors apply their own ESG policies as a condition of finance, but there is no existing government requirement to do so. Where such an expectation is established, consistent with Recommendation 1, the resulting credible transition plan could then serve as an assessment input under SSDs and FIRB processes, evaluating the extent to which capital investments are structured to deliver tangible, distributive benefits for host communities.

For new developments, strategic planning assessments under these mechanisms would account for local impacts across both urban and regional contexts, ensuring capital investments translate into tangible, broadly shared benefits for households, local industries and impacted communities. This can be operationalised by leveraging existing mechanisms:

- In metropolitan areas, it means planning conditions that require consultation to genuinely address suburban liveability concerns, including heat, noise and cumulative strain on public infrastructure. Rather than adding regulatory delays, benefit-sharing can be integrated through negotiated arrangements such as Voluntary Planning Agreements. This could involve co-funding local renewable energy and battery storage to protect households from peak-demand price spikes, or funding local e-waste programs to prevent critical minerals from entering landfill, and recycling them back into the economy.
- In regional areas, it means deep community engagement on the spatial footprint of data centres and any dedicated energy infrastructure, with co-design processes that safeguard critical agriculture and biodiversity. Where data centres put pressure on water catchments, governments can use developer contribution agreements, which already apply where a new development places additional demand on public utility infrastructure, to fund upgrades to local water infrastructure or net zero water cooling technologies.
- Across both contexts, establishing funded training pipelines with local TAFEs and universities, captured through credible transition plans, would provide residents with genuine skills and employment pathways into the AI and data centre infrastructure sectors.

For developments already underway, where there is limited scope to alter site design or location, operational and utility conditions can ensure data centre operators mitigate cumulative resource strain while delivering socio-economic benefits to impacted communities. This could take the form of ongoing reporting, community liaison, and incentivised benefit-sharing frameworks triggered by subsequent capacity expansions or environmental compliance reviews, ideally fostering accountability and local benefit without reopening the original planning approval itself.

Climateworks suggests the government:

- Consider how state planning and assessment mechanisms, such as SSDs, could be used to require data centre developers to demonstrate genuine community consultation and deliver tangible benefits as a condition of approval.
- Consider whether the Treasurer's strengthened conditioning powers under the 2026 foreign investment reforms could be used to incorporate community benefit and consultation commitments into FIRB approvals for data centre and AI infrastructure investments.
- Develop clear guidance on what meaningful community consultation looks like for data centre developers in both urban and regional contexts, aligned with the principles of the Developer Rating Scheme used for renewable energy infrastructure, including minimum standards for

engagement, disclosure of anticipated impacts, and mechanisms for ongoing community input during operations (DCCEEW 2026b).
- Require data centre developers to demonstrate, through credible transition plans, how developments will deliver tangible socio-economic, climate and nature benefits to host communities, including through co-investment in local renewable energy and storage, water infrastructure or efficiency measures, and local employment and skills pathways.
- Work with states and territories through the Energy and Climate Change Ministerial Council to ensure community benefit and consultation standards are consistent across jurisdictions, recognising that data centre development occurs at different scales and under different planning regimes across Australia.

Thank you for taking the time to consider our submission. We would welcome an opportunity to further brief the Environment and Communications Reference Committee on our work.

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