Getting the balance right:
Data centre growth and the energy transition

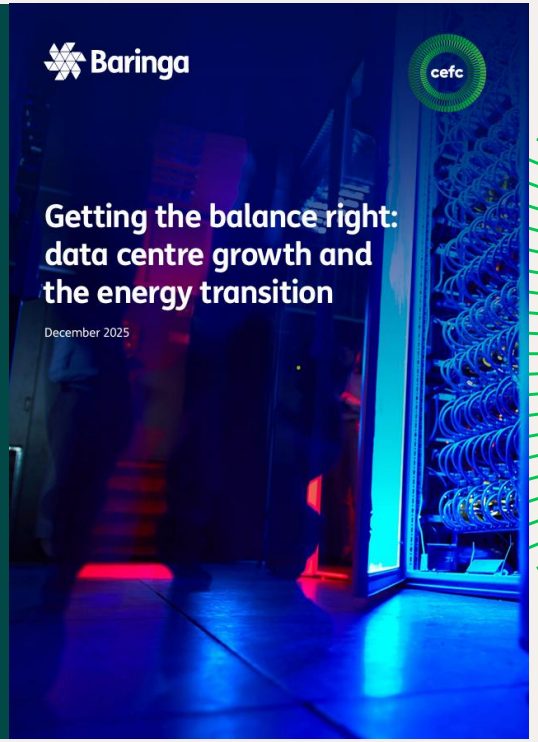
CEFC Investment Insight: December 2025

Summary of Baringa's analysis for the CEFC

Why this matters, at a glance

This investment insight highlights key findings from the report: **Getting the balance right - Data centre growth and the energy transition.** Commissioned by the CEFC and prepared by Baringa.

- Data centres house computer hardware to store and process digital information. They are essential to Australia's digital economy, AI, payments, cloud, government services.
- Market growth is rapid, investment capital is flowing, concentration around Sydney and Melbourne is intensifying.
- Data centre loads need to be matched with new renewables and energy storage to avoid electricity and emissions impact.
- Managed growth can ensure that data centres do not 'crowd out' grid access for other sectors of the economy undergoing rapid electrification, such as transport.
- The report outlines the opportunity to address these issues through direct clean build, smarter siting, better flexibility and strong policy settings.



→ Read the full report at www.cefc.com.au/insights/datacentres

2035 Headline outcomes

Massive growth trajectory:

4.7 GW - 7.4 GW

central case high case

Energy challenge:

8-11%

Energy use by 2035, up from 1% today

Geographical concentration:

>75%

Planned capacity in Sydney and Melbourne

Significant investment scale:

$85b - $135b

Renewables solution

3.2 GW + 1.9 GW

renewables **storage**

Contains price increases and neutralises increased emissions

Data centre types

Hyperscale and colocation data centres are transforming the market

Edge DC
<0.1 – 0.15 MW

Smaller facilities located closer to end users, reducing latency and delivering faster services.

Examples: Smart city control, industrial automation, healthcare and retail.

Colocation DC
~100 MW

Shared facilities, typically smaller than hyperscale facilities, where providers lease server space to multiple companies. Allows businesses to house their IT infrastructure without building their own data centres.

Examples: Government hosting, financial and SAAS hosting.

Hyperscale DC
>100 MW

Large-scale facilities designed for large workloads including AI inference and training, cloud computing, and big data storage.

Examples: AI training and inference, enterprise cloud computing and streaming platforms.

Enterprise*
1 – 100 MW

On-premises facilities of varying sizes operated by individual organisations for their exclusive use. Shift away from this model as less scalability and efficiencies than hyperscale models.

Crypto Mining*

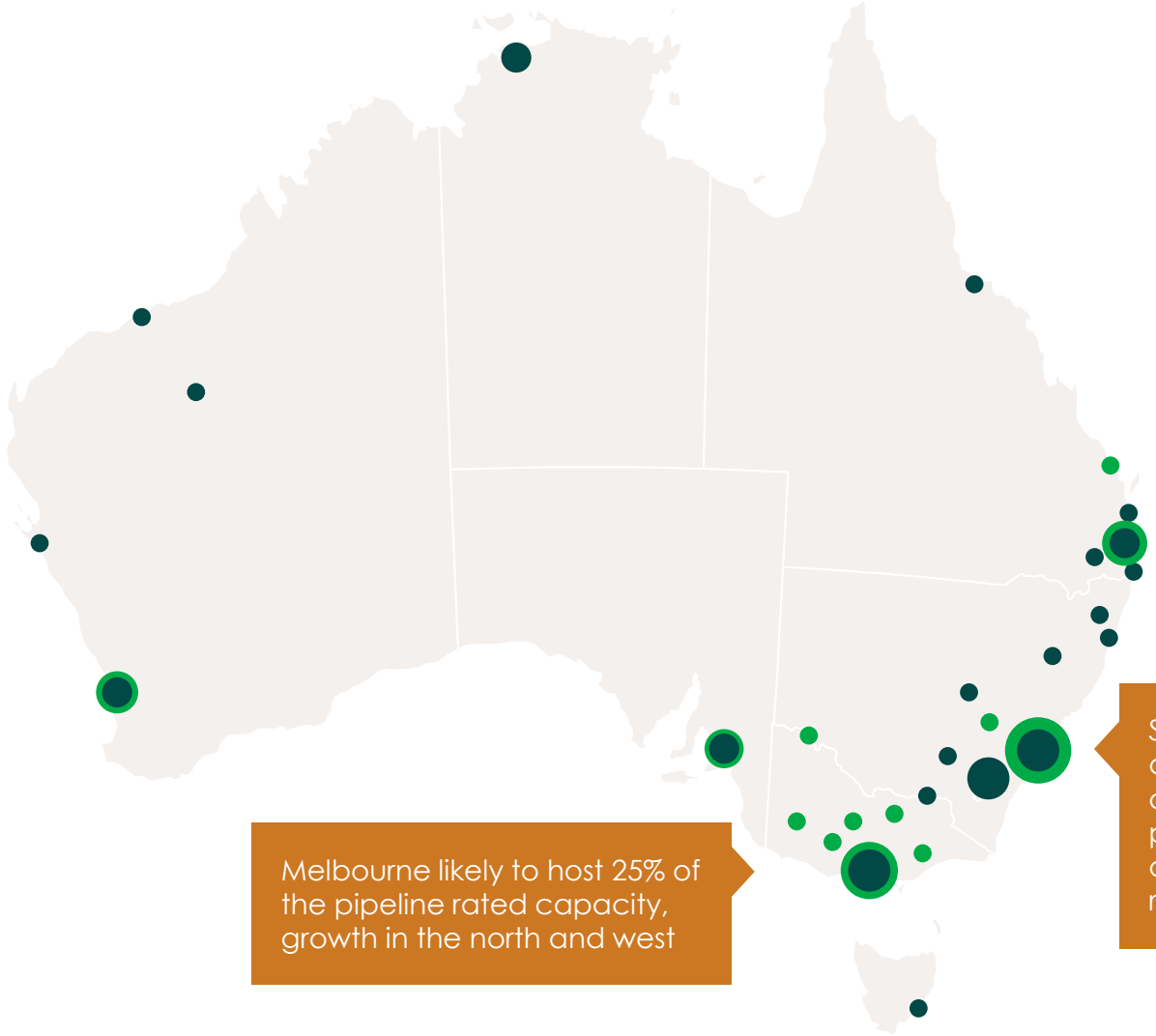
Specialised facilities designed solely to process cryptocurrency transactions. As AI demand outpaces crypto growth, these data centres are increasingly converting their facilities to service hyperscale cloud needs.

*Note: enterprise and crypto mining can fall across any of the other three types of data centres i.e. edge, colocation or hyperscale.

Data centre growth is concentrated in major metropolitan areas

Distribution of existing and pipeline data centre nameplate capacity

Existing Only	Existing and Pipeline
>2 GW	>2 GW
1 – 2 GW	1 – 2 GW
100 MW – 1 GW	100 MW – 1 GW
10 – 100 MW	10 – 100 MW
<10 MW	<10 MW



Melbourne likely to host 25% of the pipeline rated capacity, growth in the north and west

Sydney is the dominant hub, about half of the pipeline projects, adding 2.6 GW of rated capacity

- Emerging nodes: Brisbane North Supernode, Perth, select REZ adjacent locations
- Decisive factors include proximity to workforce, fibre, availability zones, and cable landings

What's driving Australia's data centre boom?

- Surging data use and AI adoption across households and businesses
- Hyperscale and colocation models dominate the pipeline powering AI and cloud services
- Australia's competitive advantages: renewable resources, land, data sovereignty, geopolitical stability, subsea connectivity
- APAC context, despite strong regional competition, Australia is well placed when clean energy can be procured at scale.

Source: Baringa (2025) Data centre market scanning report.

*% of generation which is from renewable sources 2024–2030, looking at the projected power mix from Baringa's power market projections, and the natural climate attractiveness for renewable energy.

Australia ranks highest in APAC in terms of overall market attractiveness for data centre operators - taking into account demand, development ease, renewable energy availability, policy environment and macro risk.

APAC Market attractiveness

		Clean energy*	Overall
1	Australia	High	Very attractive
2	Singapore	Low	High
3	Japan	Medium	High
4	South Korea	Low	High
5	Vietnam	Medium	Medium
6	Taiwan	Low	Medium
7	Malaysia	Low	Medium
8	Philippines	Medium	Medium

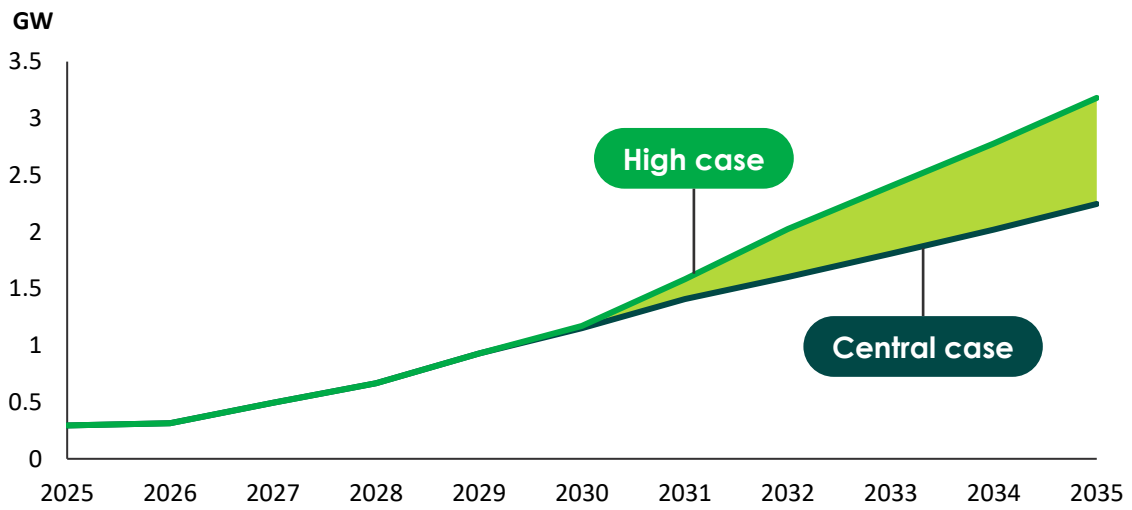
Australia's pipeline, the shape of growth

Two growth cases for planning:

1. **Central case:**
   Pragmatic delivery of approved projects, moderated growth post-2030

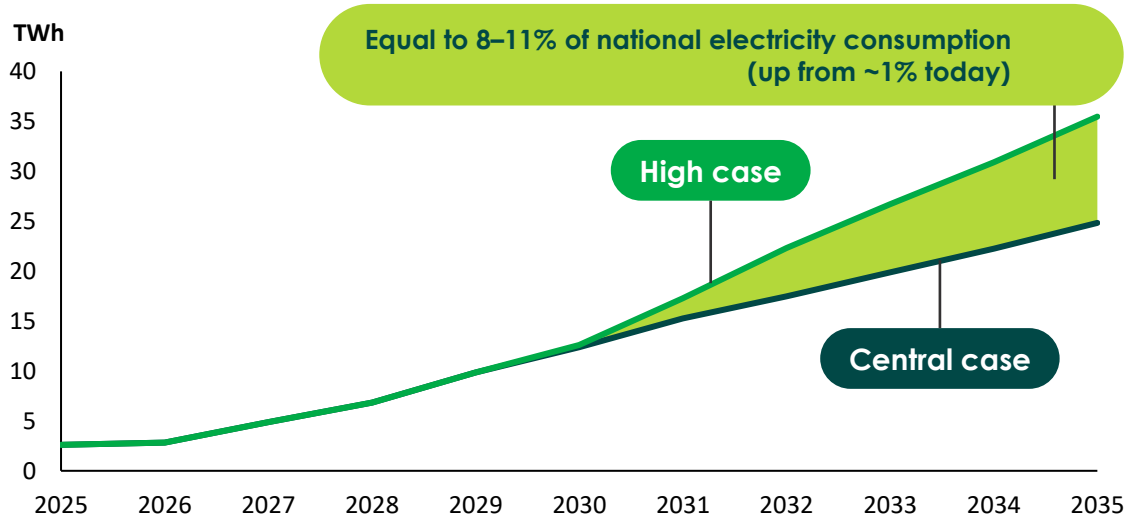
2. **High case:**
   Most projects arrive on time, limited deterrents

Operational capacity



Australia's total data centre capacity is expected to be at least four times larger than current levels by 2035, even under the central case.

Electricity consumption



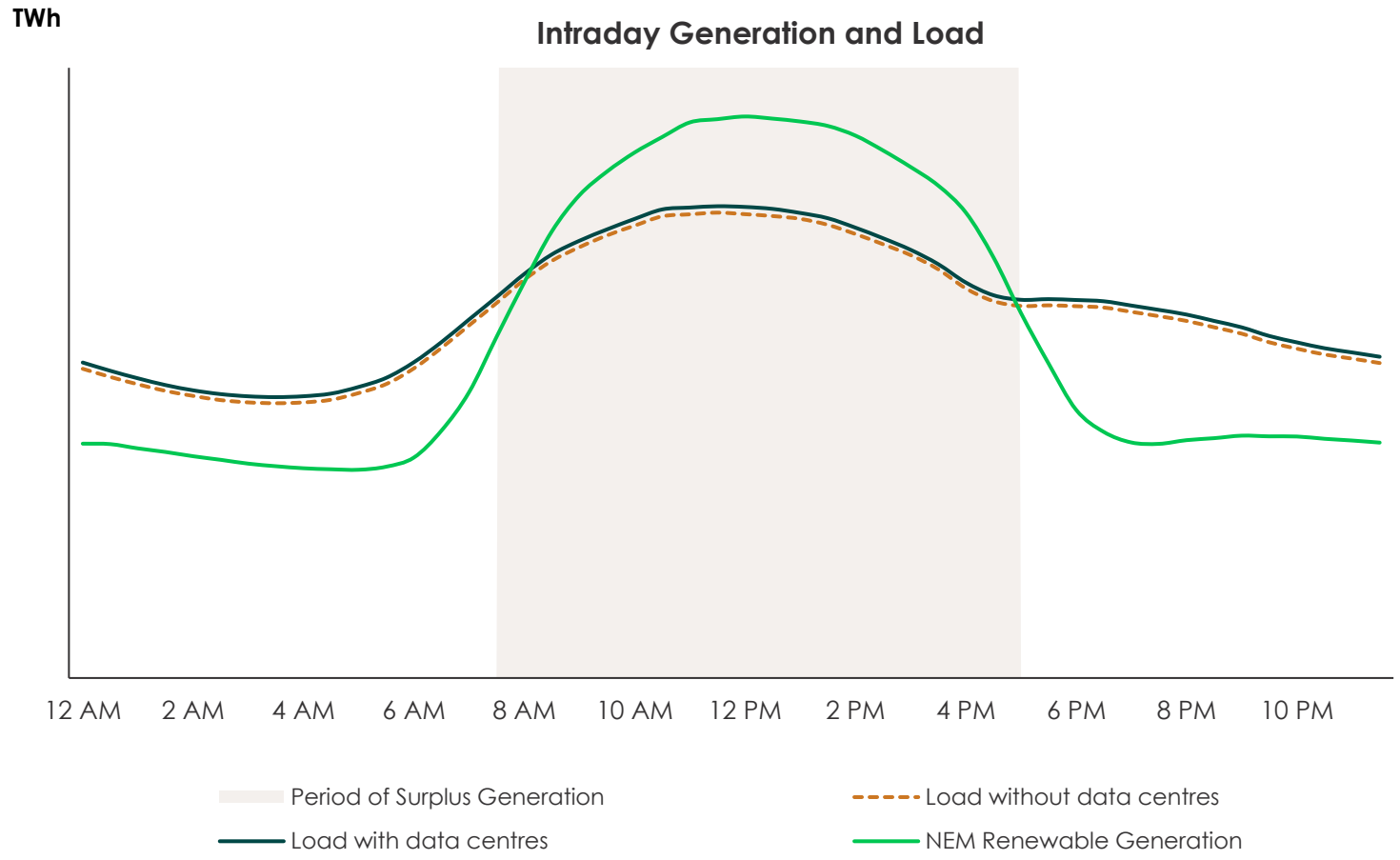
Australian data centres could consume up to 24 TWh annually by 2034–35 under the central case.

Source: Baringa developed a bottom-up project pipeline of rated capacity, applying a ramp–up period based on AEMO assumptions by data centre type and size.
Additional sources include *Empowering Australia's digital future*, Mandala; and *Forecasting Reference Group May presentation and 2024 ISP*, AEMO.

The load profile that matters

- Data centres are flat, high-capacity factor consumers
- Daytime load can reduce renewable curtailment
- Evening and morning peaks widen the gap that peaking plants must fill if not firmed by storage
- Higher prices and higher emissions will result without matching supply

Illustrative example of the intraday impacts of additional load from data centres



Opportunity to mitigate impacts through coordinated action

Risks
if data centre growth is unmanaged

- Grid constraints
- Higher wholesale electricity prices
- Increased emissions
- Geographical concentration
- Water and land use competition

Opportunities
if coordinated

- Stimulate $135B in investment
- Accelerate renewable deployment
- Enhance grid stability with flexible load
- Guiding investment to best locations
- Improved efficiency, community benefits

Baringa modelled scenarios

Modelled set of scenarios based on the central growth pipeline (pragmatic delivery of approved projects, moderated growth post-2030) to quantify the impacts of potential development paths to 2035:

	Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Baringa reference case	No mitigation	Additional renewables	Additional renewables + 50% storage	Additional renewables + 100% storage
Data centre demand: 2024 ESOO data centre sensitivity*	✓	✓	✓	✓	✓
Additional data centre demand: Baringa central case		✓	✓	✓	✓
Additional renewable generation by 2035			3.2 GW	3.2 GW	3.2 GW
Additional 4-hour storage by 2035				0.95 GW	1.9 GW

*Source: AEMO (2024) '2024 Electricity Statement of Opportunities'.

Longer-term outlook – unmanaged growth risks driving up prices and emissions

Modelled set of scenarios based on the central growth pipeline to quantify the impacts of potential development paths to 2035:

Baseline
Baringa reference case

Scenario 1
No mitigation

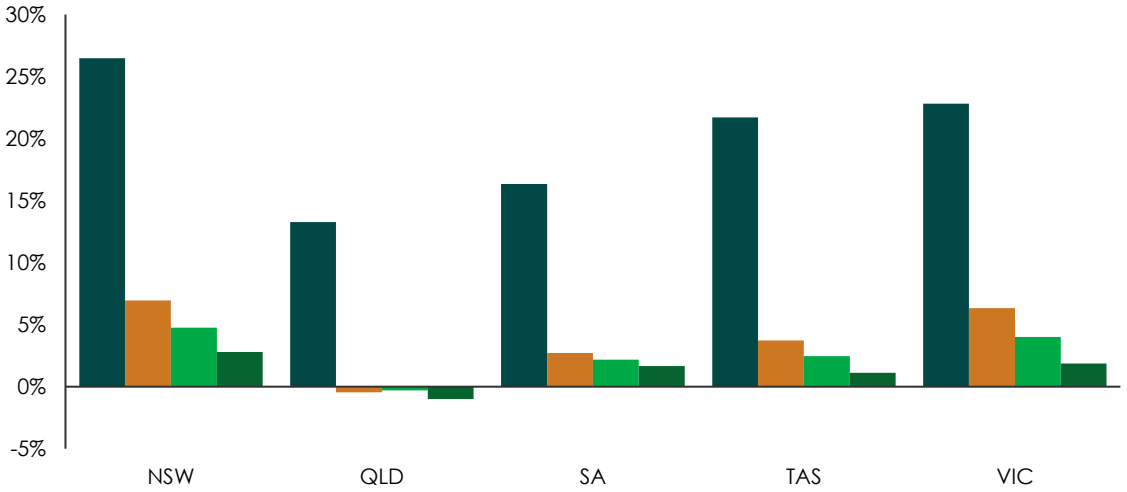
Scenario 2
Additional renewables

Scenario 3
Additional 3.2 GW renewables & 0.95 GW storage

Scenario 4
Additional 3.2 GW renewables & 1.9 GW storage

Average load-weighted prices in 2035

Change relative to baseline



Grid emissions by region in 2035

Change relative to baseline

Note: The *Reference Case* is Baringa's best estimate for the future of electricity markets, incorporating trends in demand, capacity, policy and market dynamics to project prices and emissions under current assumptions.

Additional renewables can substantially mitigate impacts

Scenario 2 modelling

Additional renewables needed above baseline by 2035

About 3.2 GW
in total, mix of wind and solar

With this match in place, price rises in 2035 compared to baseline contained to

~7 %
in NSW

~6 %
in VIC

and emissions increase eliminated

Without new renewable generation

Impact on electricity prices by 2035 could be >20% in NSW/VIC and emissions impacts could be ~14% across the NEM in a central case scenario

Corporate PPAs

are a proven path, but must be additional and delivered on time

Adding flexibility and storage provide further mitigation

Scenario 4 modelling

Add large-scale storage

about 1.9 GW

Four-hour BESS,
to shape load

Price impacts fall further

~3 %

in NSW

~2 %

in VIC

- Behind-the-meter BESS where space allows or off-site BESS underwritten by long tenor contracts
- Additional flexibility levers, workload shifting, VPP participation, on-site generation and demand response
- Flexible connections plus storage can accelerate safe connections and reduce augmentation needs

Consideration should be given to the suitability of different sites for additional data centre growth, among other key factors

Summary of network impacts of placing data centres in example location types across Australia

Location	Location suitability						Headroom utilisation	Renewable utilisation
	Fibre connectivity	Proximity to infrastructure	Proximity to skilled workforce	Proximity to population	Proximity to cloud availability zones	Land availability		
Western Sydney (Urban)	🟢	🟢	🟢	🟢	🟢	🟡	🟡	🟡
Hunter Central-Coast REZ (Regional)	🟢	🟡	🟡	🟡	🟡	🟢	🟢	🟢
South-West REZ (Remote)	🔴	🔴	🔴	🔴	🔴	🟢	🟡	🟢
Brisbane North (Urban non-established)	🟢	🟢	🟢	🟢	🟡	🟢	🟡	🟡

Attractiveness: 🟢 High 🟡 Medium 🔴 Low

Innovation and efficiencies driven by AI will continue to play an important role in reducing the impact of data centres

Potential data centre innovations

Old world data centre

Data centre Location: city

- Gas engine
- Diesel engine
- Grid power imports
- Diesel/gas back-up

Thermal power supply

- **Grid power supply**
- **Thermal back-up:** Diesel / gas back-up power generation
- **Baseload demand:** Non-flex site demand

New world data centre

- Biomethane/ Renewable Diesel
- Engine
- Heat offtake
- Data centre campus
- Advanced cooling to DC
- Advanced, multi-technology energy asset

On-site power

- **On-site renewables**
- **Batteries + UPS**
- **Microgrids**
- **Hydrogen fuel cells**

Energy efficiency and waste heat

- **District heating**
- Hyper **efficient** data centre energy use prevents waste

PPA

- **Off-site renewables and storage**

Clean transport

- **Electric vehicles**

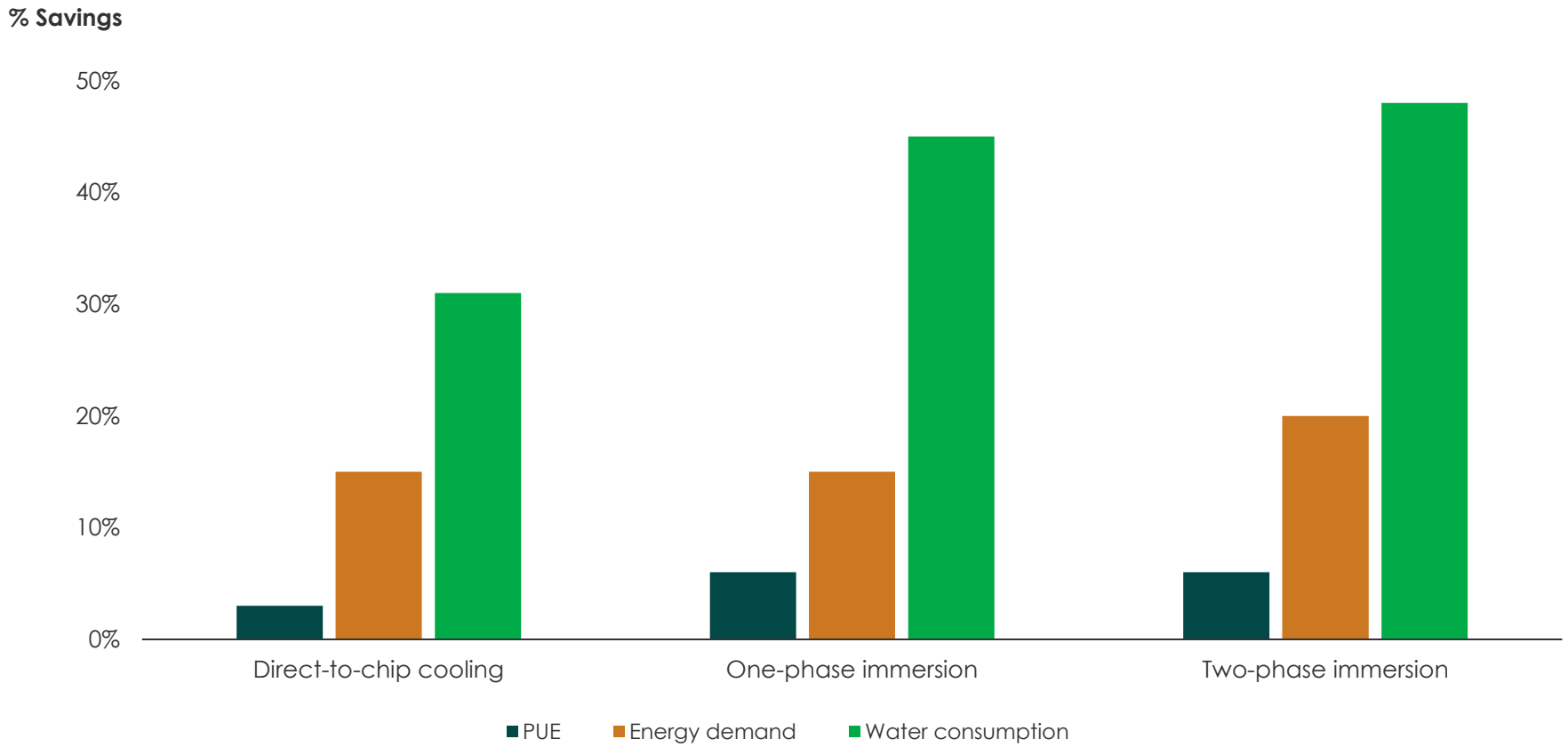
Flexibility

- **Energy/load flexibility**
- **IT load flexibility**

Clear policy and regulation needed to incentivise innovations. Investors and developers need to consider implementation of innovations.

Advancements in data centre cooling and energy efficiency

Savings achieved by different technology when compared with an air-cooled data centre



Innovation in data centre cooling has led to measurable reductions in energy consumption, enhancing PUE, albeit some solutions require additional water use

Source: Alissa, H. et al. Using life cycle assessment to drive innovation for sustainable cool clouds. Nature (2025).

Policymakers call-to-action

Policy levers to drive sustainable data centre growth

- Ensure clear signals, procurement standards for government workloads, for example, five-star NABERS for data centres serving government
- Improve visibility of expected data centre load, support coordinated siting where headroom and renewable energy build can be unlocked
- Enable flexible connections, accelerate renewable energy and storage, support cleaner back-up solutions, renewable diesel, hydrogen fuel cells where feasible
- Keep regulatory frameworks fit for purpose as the build accelerates

Policy levers can be used to deliver:

Locational coordination

Guiding investment to areas with existing grid capacity and renewable potential

Clean energy

Incentivising and enabling data centres to procure or underwrite new renewable and firming projects

Visibility and transparency

Improving data on future electricity demand and project pipelines

System security

Ensuring large load connections are integrated safely and flexibly with the grid

Investors’ call-to-action

Investors have a key role to play in ensuring the sustainability of data centres

- Embed ESG requirements in investment decisions
- Reward best practice, use the Australian Sustainable Finance Taxonomy and EU Green Taxonomy as guides
- Encourage operators to move towards 100% renewable electricity, high energy efficiency, no on-site fossil combustion, credible time matching roadmaps
- Structure green bonds and sustainability-linked loans with objective tests, ensure real green differentiation
- Understand the environmental impacts and disclosure obligations for future sustainability reporting requirements

Industry's call-to-action

Data centre operators and customers need to maintain social licence to operate

- Major global players in AI and data centres have made strong commitments to clean energy use
- Australian industry must act now to match new digital load with additional renewables and storage
- Effective use of innovation to increase efficiency and reduce fossil fuel back-up
- Operators to coordinate closely with customers to understand their needs and limitations
- Operations meet minimum standards, with robust due diligence and reporting undertaken

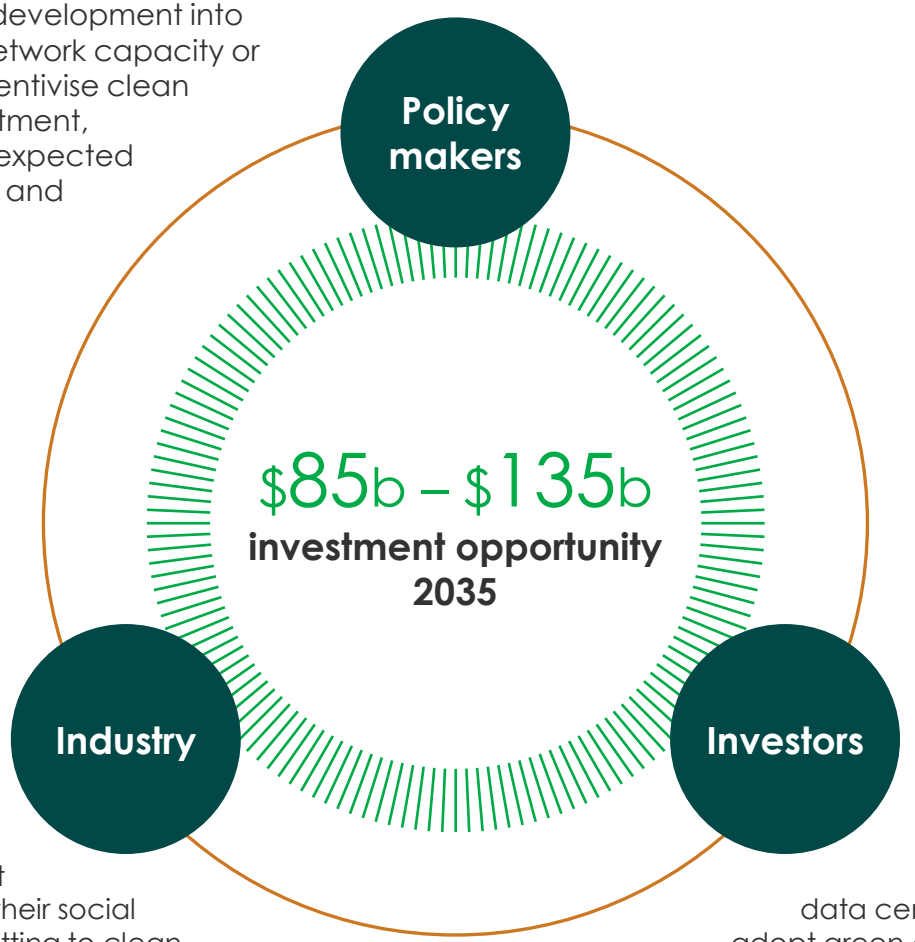
Opportunity: capture the digital economy dividend, protect consumers, cut emissions, strengthen energy security

Summary

Coordinated action to capture benefits

Industry, government and investors must work together to realise the potential

Policymakers can guide development into locations with sufficient network capacity or strategic importance, incentivise clean energy and storage investment, improve transparency of expected loads to support planning and manage network costs.

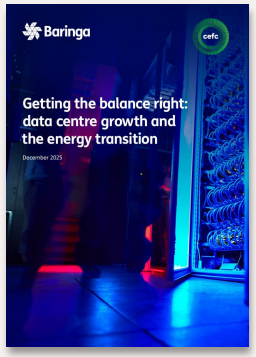


Data centre operators must act decisively to maintain their social licence to operate, committing to clean energy procurement, investing in storage, and adopting innovative technologies. And operators should work closely with customers to align on ESG requirements and reporting standards, while developing new business models that deliver resilience and efficiency.

Investors can incentivise data centres to minimise impacts and adopt green operations. Capital should be directed towards projects and companies that prioritise ESG factors. Bond issuers, sustainability-linked loan providers and infrastructure funds can act as important triggers, rewarding innovation.

Thank you

This CEFC Investment Insight – *Getting the balance right, data centre growth and the energy transition* – draws from broader research commissioned by the CEFC and prepared by Baringa.



Download the full report:
cefc.com.au/insights/datacentres

For more information, visit cefc.com.au

Note: Modelling conducted March 2025 with 2024 ESOO inputs, AEMO 2025 ESOO and Baringa Q3 Reference Case provide updated figures, directional findings remain valid.

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About the CEFC

The CEFC is Australia's specialist climate investor, helping cut emissions in the race towards net zero by 2050. We invest in the latest technologies to generate, store, manage and transmit clean energy. Our discounted asset finance programs help put more Australians on the path to sustainability, in their homes and on the road. CEFC capital is also backing the net zero transformation of our natural capital, infrastructure, property and resources sectors, while providing critical capital for the emerging climate tech businesses of tomorrow. With access to more than $33 billion from the Australian Government, we invest to deliver a positive return for taxpayers.