GovHack 2025:
Australia's AI Future -
A Data-Driven Framework for Data Center Siting

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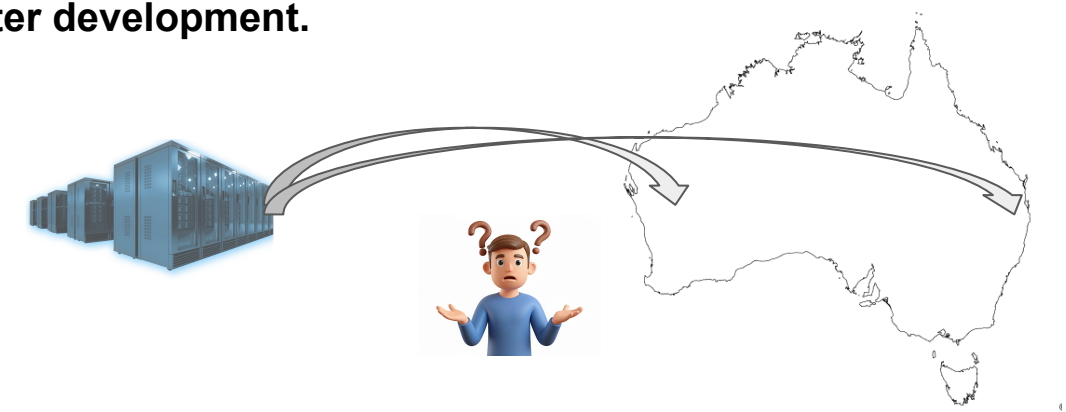
The Challenge:

Data Centers: A Cornerstone of Australia's AI Future

With AI driving exponential data growth, data centers are now essential. With abundant resources, reliable power supply, skilled workforce, and strategic location between East Asia and USA, **Australia is exceptionally well positioned to become a leading data center hub.**

Despite Australia's strong fundamentals for data-center growth, currently there is no standard framework to evaluate optimal siting for data center.

This report proposes a data-based evaluation framework uses it to identify the regions most suited for data-center development.



The Framework:

Five Major Factors to Select Suitable Locations

Power Availability & Reliability

Data centers rely on massive power consumption, making energy availability and grid stability critical determinants in site selection.

Cooling & Thermal Management

Data centers generate substantial waste heat, making cooling capacity a critical siting factor, particularly in regions with access to water resources or naturally cooler climates.

Connectivity

Data centers rely on large-scale data transmission, and heavy data flows from East Asia and the U.S. make proximity to submarine cables a key siting factor.

Talent & Labor Force

Data centers require skilled professionals such as network and server engineers to ensure reliable operations, making access to talent a key siting factor.

Land & Infrastructure

Data centers require large land parcels and reliable infrastructure, including power, water, and fire protection, making regions with low-cost land and strong utilities a critical siting factor.

The Factor One:

Power Availability & Reliability

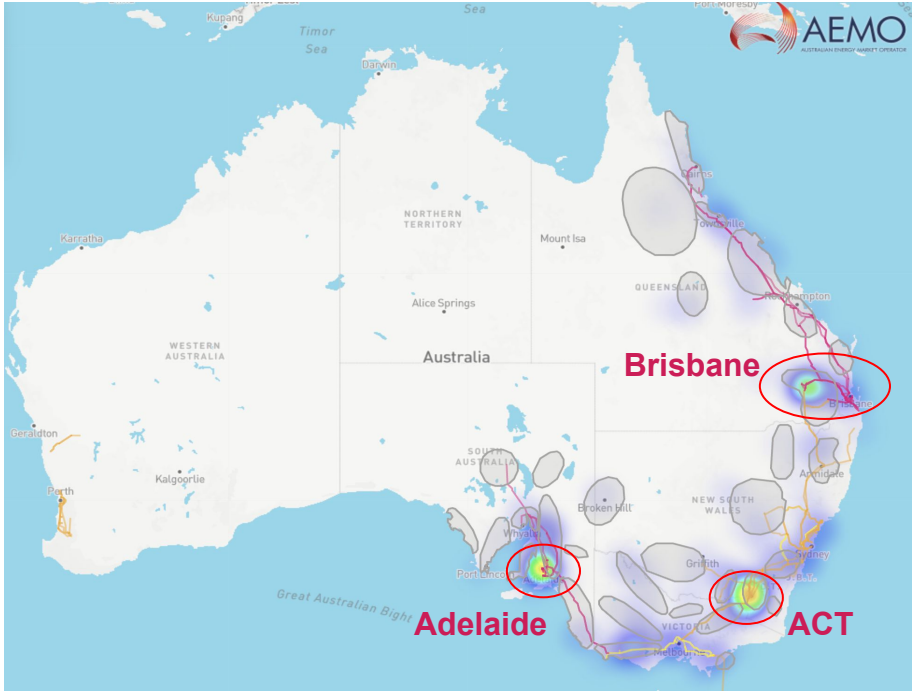


Figure: Map of Australia's clean energy landscape. Coloured regions indicate current supply density, with deeper red representing higher energy availability. Grey circles highlight areas with strong future clean-energy potential. Grid connectivity is shown with transmission lines: yellow (500 kV), orange (330 kV), and red (275 kV). Clean-energy sources include wind, solar, hydro, and gas.

Regions with Current & Future Clean Power Supply:
Brisbane, ACT, Adelaide

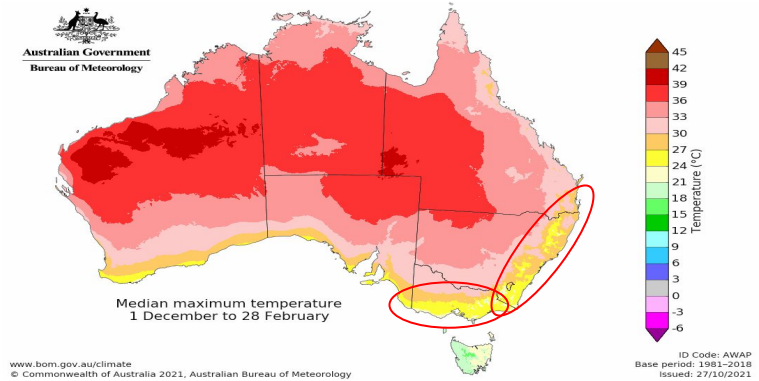
Regions with Future Clean Power Potential:
Melbourne, Armidale

- The operation of a large data center can require millions of kWh each month. Therefore, regions with abundant supply, grid stability, and access to low-carbon energy make energy availability a decisive factor in site selection.
- AEMO geospatial data highlights regions where grid stability, current clean-energy availability, and future potential.

Source: Australian Energy Market Operator Grid Data

The Factor Two:

Cooling & Thermal Management - Temperature & Water



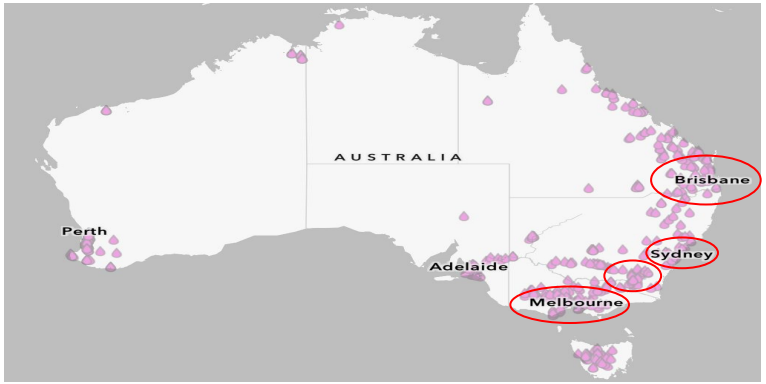


Figure: (Upper) Median maximum temperatures in Australia during summer (Dec–Feb), with deeper red indicating higher temperatures.
(Lower) Distribution of water storage volume across Australia, where denser clusters of purple droplets represent greater water availability.

Regions with Moderate Temperature & Reliable Water Supply:

ACT, Melbourne, Sydney, Brisbane

- Data centers produce waste heat, thus effective cooling is critical.
- While both air and liquid cooling are used, liquid cooling offers higher efficiency. As a result, ideal sites are regions with moderate temperatures and reliable water supply.
- Based on Australia's summer median maximum temperature and water storage distribution, the southeastern coastal urban regions are most favourable.

Source:

- Australia Bureau of Meteorology
- Digital Atlas of Australia

The Factor Three:

Connectivity - Submarine Cable & Intercity Fiber Network

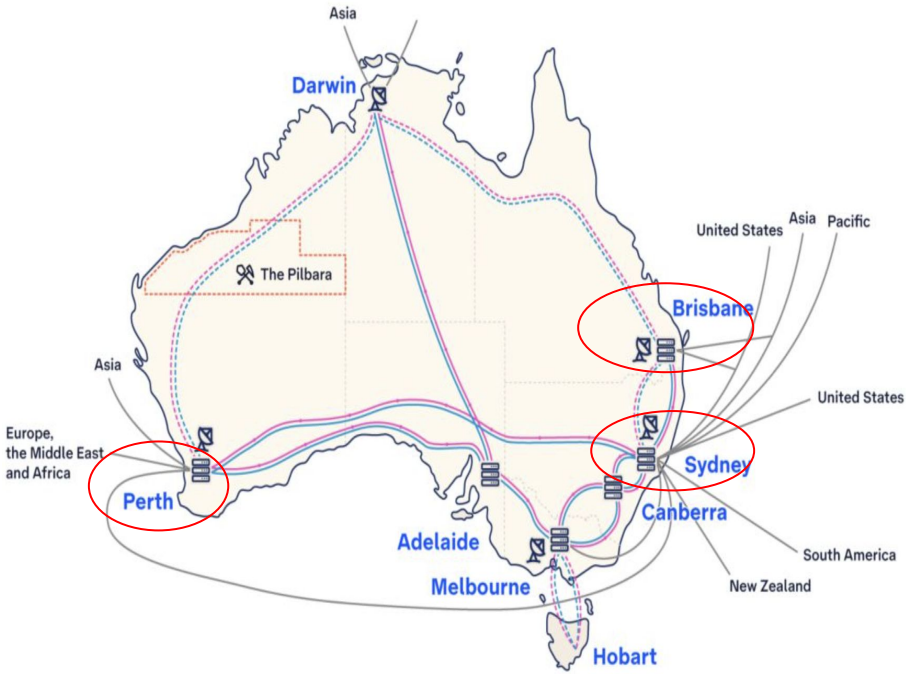


Figure: Map of Australia's submarine cable and intercity fiber network connectivity, showing landing points of submarine cables and the fiber network links between major Australian cities.

Regions near submarine cable landing point & Major city:

Sydney, Brisbane, Perth

Regions with great potential:

ACT, Melbourne

- As AI booming, vast volumes of data need storage and processing. Australia's strategic location between the world's two largest data-producing areas, East Asia and the United States makes it ideal for data-center development.

- Massive data flows rely on cable connections, so proximity to submarine cable landing points and major domestic city data hubs is crucial to reduce latency and costs.

Source: Intercity Fiber Network

The Factor Four:

Talent & Labor Force

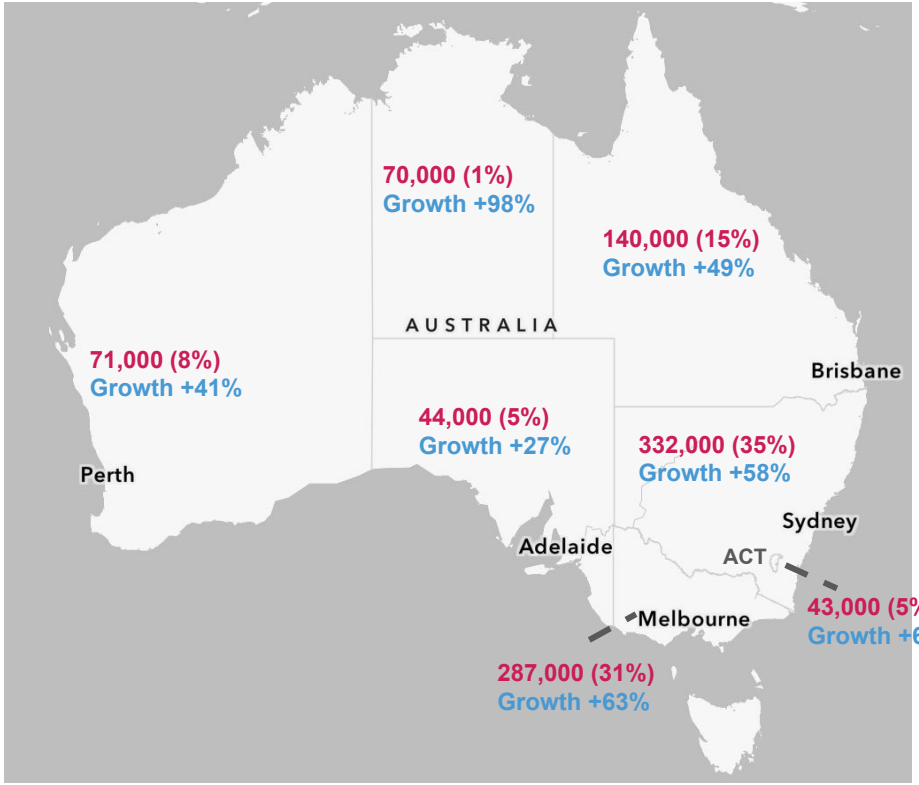


Figure: Distribution of tech workforce across Australian states in 2023, showing headcount by state and annotated growth rates.

Regions near submarine cable landing point & Major city:

Sydney, Melbourne, Brisbane, ACT

- Data center operations need diverse tech talent (electricians, network and server engineers, equipment engineers…etc.), so proximity to talent hubs is essential.
- Tech Council 2023 data shows Queensland, NSW, ACT and Victoria have strong current workforces and good growth potential; these states also host leading universities that feed the talent pipeline.

Source: Tech job update by TechCouncil of Australia

The Factor Five:

Land & Infrastructure

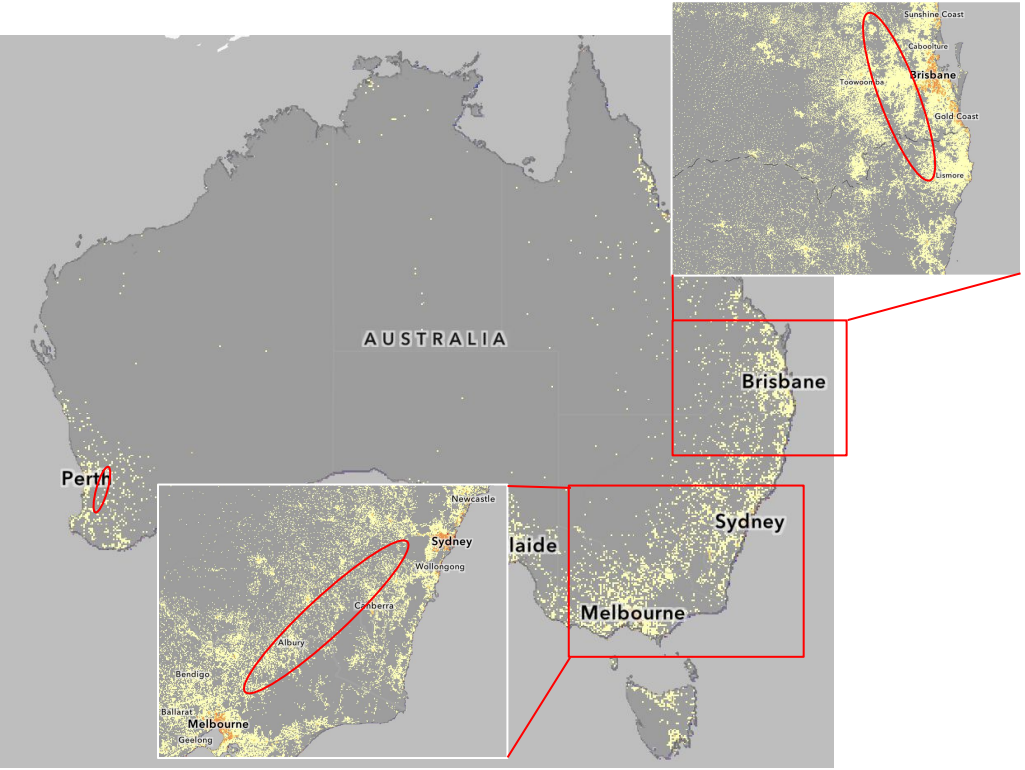


Figure: ABS 2024 map of population distribution across Australia; brighter, denser areas indicate higher population concentration.

Regions (Suburban Zones) with moderate populate density:

Brisbane, ACT, Melbourne, Sydney, Perth

- Data centers need large, low-cost land, mature utilities (power, water, fire protection) and low disaster exposure.
- Because dense urban areas have strong infrastructure but high land prices, and very sparse areas lack utilities, population density is an effective proxy to find the sweet spot: suburban zones with moderate density close to cities.
- Applying this rule identifies outer Brisbane and the Sydney→ACT→Melbourne suburban corridor as the most suitable areas.

Source: Digital Atlas of Australia

The Summary:

Brisbane & ACT are current top locations, Sydney & Melbourne hold high future potential.

Factor / Region	Power Availability & Reliability	Cooling & Thermal Management	Connectivity	Talent & Labor Force	Land & Infrastructure	Total Score
Brisbane	1	1	1	1	1	**5**
ACT	1	1	0.5	1	1	**4.5**
Sydney	0	1	1	1	1	**4**
Melbourne	0.5	1	0.5	1	1	**4**
Perth	0	0	1	0.5	1	**2.5**

- Under the framework, each region is scored across five factors: assign **1 point** if the region meets the criterion currently and **0.5 points** if it shows future potential; a region's overall score is the sum across all five factors.
- Based on the five-factor scores, Brisbane and the ACT rank as the most suitable regions for immediate data center development, with Sydney and Melbourne closely following.

Source: Digital Atlas of Australia

The Summary:

Summary & Future Work

Purpose: Provide a practical Data Center site-selection framework to support development of international-grade data centers in Australia.

Framework: Assess regions using five core factors — Power Availability & Reliability; Cooling & Thermal Management; Connectivity; Talent & Labour Force; and Land & Infrastructure.

Approach & scope: Applied the framework as a high-level, nationwide screening across Australia's major regions to identify suitable large-scale locations.

Key finding: Brisbane and the ACT score highest for immediate development; Sydney and Melbourne are close behind.

Limitations: Analysis was completed within a single weekend and therefore produces a regional-level shortlist rather than detailed site recommendations.

Future work / recommendations:

- Introduce weighted scoring for the five factors to reflect real-world priorities and investor requirements.
- Perform localized, granular analysis that incorporates additional site-specific criteria (e.g., local permitting, detailed grid capacity, environmental risk).
- Update results with more comprehensive datasets and stakeholder consultation to validate and refine the shortlist.

The Reference:
Datasets

1. **AEMO Map**: incorporates geospatial data and visualizations to map Australia's current energy landscape, including regional energy sources, density, and grid distribution. This provides a robust data foundation to assess and evaluate power availability and reliability across potential data center locations.

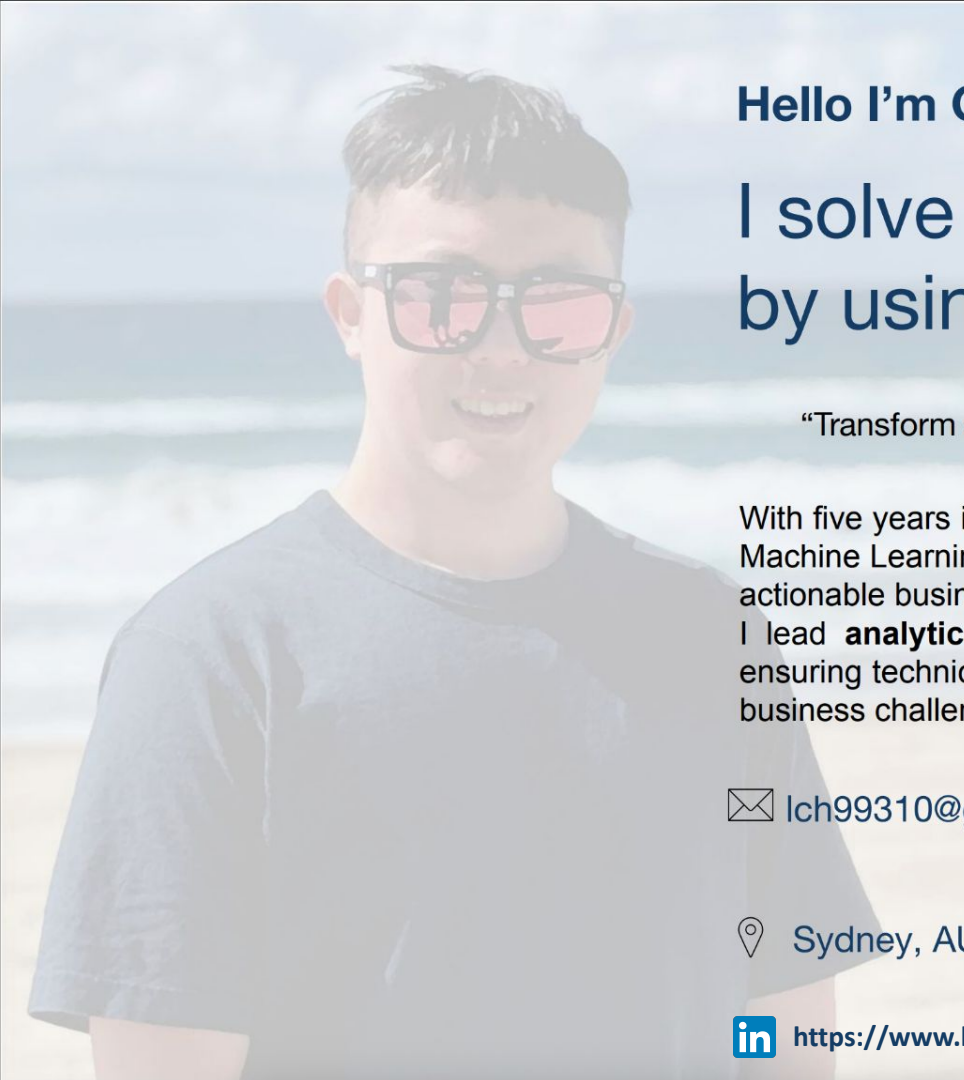
2. **Australia Bureau of Meteorology**: includes visualized data on the median peak temperatures across Australia during the summer months (December to February), enabling a clear assessment of cooling requirements as a critical factor in site evaluation.

3. **Digital Atlas of Australia**: incorporates data on water storage volumes across different regions of Australia, providing a critical input for evaluating cooling capacity as part of the site assessment.

4. **Intercity Fibre Network - Telstra InfraCo**: provides mapping of Australia's submarine cables and fiber connections between major cities, offering a clear view of the country's data transmission infrastructure and supporting a more informed assessment of connectivity.

5. **TechCouncil-Tech-Jobs-Update-May-2023_final-1.pdf**: includes statistical data on tech workers across Australian states, detailing current job availability and projected growth rates, which serves as a key input for evaluating talent and labor force.

6. **Digital Atlas of Australia**: presents population data across Australia, highlighting regional population density and distribution, which provides valuable insights for analyzing and assessing land availability and infrastructure capacity.



Hello I'm CH Lee

I solve real business problems by using **Data Analysis** & **AI**

"Transform data into impacts: Insights discovered, solutions delivered."

With five years in tech, I specialize in **Data Analytics**, complemented by AI and Machine Learning, to **uncover critical insights** and translate complex data into actionable business strategies and actions.
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