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1. Abstract
This white paper titled "Elevating Perth: The Future Global Epicentre for AI Digital Infrastructure" provides a comprehensive analysis of the key factors that establish Western Australia (WA) as an ideal location for the deployment of digital infrastructure to support generative and large language AI model deployment.

The Tech Council of Australia (TCA) and Microsoft’s recent report,"Australia's Generative AI Opportunity" highlights the potential of generative AI to contribute as much as $115 billion pa to Australia’s economy by 2030. The extent of this economic boon depends however on the pace of AI adoption across all industries and in the investment in new technology, and upskilling the workforce. The report estimates that in a slow-paced adoption scenario, AI could contribute $45 billion pa to the Australian economy by 2030. In medium and fast-paced adoption scenarios, this figure could rise to $75 billion and $115 billion, respectively.

The article “ChatGPT Is Just The Start: AI Is Rewriting The Data Centre Real Estate Map” by Bisnow notes:

“Among the Data Centre experts, there was a consensus: widespread adoption of AI will accelerate the decentralisation of the Data Centre landscape, driving development in new markets and away from the industry’s traditional hubs like Silicon Valley.

One significant factor is the massive power requirements for AI computing. Rising energy costs and shortages of power in the industry’s traditional hubs are already driving Data Centres into new territories, with developers increasingly prioritising locations where they have access to cheap and ideally renewable electricity. AI may well accelerate this trend as its adoption increases how much power each facility needs.

At the same time, experts say driving down the price of compute for AI through lower power costs is imperative if AI applications are going to be financially viable. At present, the enormous cost to access needed computing power through the cloud or from a Data Centre directly is broadly prohibitive.

This white paper delves into WA's strategic geographic location, globally competitive power pricing, abundant renewable energy potential, robust data privacy regulations, skilled workforce, research collaborations, market size, and the potential for next-generation Data Centres. By incorporating supporting evidence and references, this paper demonstrates why WA offers an exceptional environment for highly efficient, ethical, and sustainable AI digital infrastructure.

2. Introduction
Although AI has huge potential to solve real-world challenges, there are serious concerns about the environmental and social cost of generative and Large Language (LL) AI model training, processing, and storage. According to the National AI Centre’s March (NAIC) 2023 Australia’s AI ecosystem momentum report, “highlights the fact it takes ‘a village’ of AI product and service providers to most effectively implement AI in Australia. Australian businesses have access to the foundations to start taking advantage of AI but the partner and support ecosystem in Australia needs to be much more mature.

The article “Generative AI Breaks The Data Center: Data Center Infrastructure And Operating Costs Projected To Increase To Over $76 Billion By 2028" from Forbes highlights the massive projected added Data Centre infrastructure and operating costs, arising from AI, which is projected to exceed $76 billion by 2028. This total additional/new server cost is amortised capital plus operational cost in USD dollars.
This cost excludes the cost of the data center building structure but includes labour, power, cooling, ancillary hardware, and 3-year amortized server costs.

For perspective, this cost is more than twice the estimated annual operating cost of Amazon’s cloud service AWS, which today holds one third of the cloud infrastructure services market. This forecast incorporates an aggressive 4X improvement in hardware compute performance, but this gain is overrun by a 50X increase in processing workloads, even with a rapid rate of innovation around inference algorithms and their enhanced efficiency.

In additional, Tirias Research forecasts 2028 data center power consumption of close to 4,250 megawatts, a 212x increase over 2023. The cost of this additional power consumption also must be considered. This additional cost arises from the circa 10x increase in power required to train, process and store generative & LL AI models. In general, traditional compute is done at rack densities on average of between 4kw to 8kw per rack, whereas GPU based AI compute is generally done at between 45kw to 55kw per rack. This is a significant increase in power consumption and is continuing to rise sharply.

OpenAI CEO Sam Altman has openly stated his company is "going to be the most capital-intensive startup in Silicon Valley history". The cost of both the increased server and cooling cost to deploy generative AI workloads as well as the increased power needs to be driven down if AI is going to be financially viable.

This White Paper therefore examines how Perth, WA’s unique physical and locational attributes will help deliver a lower cost, AI enabled green data centre superhub to anchor AI megatrends in the APAC region.

3. Benefits of Western Australia for Green AI Data Centres

Geographic Location

3.1 Proximity to the Asia-Pacific Region
Western Australia’s strategic geographic location provides a significant advantage for AI Data Centres. The region’s proximity to the Asia-Pacific market, which is experiencing rapid growth in AI technologies, presents numerous opportunities for expansion and collaboration. As noted in the article "AI and the Data Center: Challenges and Investment Strategies" by InformationWeek, the Asia-Pacific region is expected to dominate the global AI market, accounting for a significant share of the overall revenue.

Occupying nearly one third of Australia’s land mass, WA is Asia’s gateway to the nation and Perth is considered Australia’s window to the world. WA shares a similar time zone with approx. 60% of the world’s population, including China, Japan, South Korea and Indonesia.

3.2 Connectivity through Undersea Fibre-Optic Cables
WA benefits from direct access to international undersea fibre-optic cables, ensuring fast and reliable connectivity with major global markets. These high-capacity cables enable Data Centres in WA to establish seamless and efficient communication with other Data Centres worldwide. The article "ChatGPT Is Just The Start: AI Is Rewriting The Data Centre Real Estate Map" by Bisnow highlights the critical role of undersea cables in enabling global connectivity and facilitating the transfer of large amounts of data essential for AI workloads. The same article also highlights that AI LL models are text based, therefore there isn’t the need for super low latency. As a result, new regions will likely be opened up. WA’s access to these undersea cables provides a competitive advantage for AI Data Centres in the region, ensuring low-latency connections and improved performance.

The fibre optic network within the State also continues to grow. Served by four international submarine cable routes and a national Perth – Sydney submarine cable route, Western Australia is perfect for global vendors planning expansion and plays a critical role in the development of digital economies across the
regions. Perth’s proximity to the Asia-Pacific region and direct connectivity through four international subsea cables offers low latency connectivity to Singapore, Jakarta, the Middle East and Europe, include:

» **Australia-Singapore Cable** (ACS) - high-capacity and low-latency submarine fibre optic cable system between Perth and Singapore, with connections to Christmas Island and Indonesia. Operated by Vocus, the ASC can provide unprotected or protected options in speeds from 10Gbps to 100Gbps.

» **INDIGO Central** - provides low latency, high-capacity services between Perth & Sydney. Completed in 2019, the cable is amongst the lowest latency routes between the East and West coast of Australia.

» **INDIGO West** - provides low latency, high-capacity services between Singapore and Perth. In addition, there are two fibre pairs connecting Singapore to Jakarta via a branching unit. Completed in 2019, the cable is amongst the lowest latency capacity systems between Asia and Australia.

» **Oman Australia Cable** - the express undersea cable directly connects to Muscat, Oman and Perth, and is privately owned and operated SUB.CO. The cable, went live in Sept 2022, has been touted to offer the lowest latency path between Australia and Europe, Middle East and Africa (EMEA).

» **SEA-ME-WE 3** (South-East Asia, Middle East, Western Europe 3) - a submarine cable linking 39 cable landing stations in 33 countries and four continents, including Asia, Australia, Africa and Europe. The cable system was supplied by ASN and Fujitsu and officially put into service in 1999. The SEA-ME-WE 3 consortium comprises 92 telecom operators.

Table 1: Perth is very well connected into approx. 4.7 billion people in APAC and beyond.

### 3.3 Reduced Risk of Natural Disasters

Perth is known for its relatively low occurrence of natural disasters, especially as compared to other parts of the Asia-Pacific region. The City is not prone to earthquakes, tsunamis, or tropical storms, reducing
the risk of catastrophic events that could impact Data Centre operations. This stability enhances the overall reliability and availability of Data Centre services. In fact, Perth has never experienced a major natural disaster that has, or would likely significantly impact its Data Centre network.

3.4 Political Stability
Australia, including Western Australia, has a strong reputation for political stability and a robust legal framework. This stability creates a favourable business environment and reduces the risk of unexpected disruptions or policy changes that could impact Data Centre operations. This makes Perth an attractive location for organisations seeking safe, reliable, and secure Data Centre services.

Perth has a particularly well-established and strong existing relationship with Singapore, especially in the business and economic sectors. The two cities share close ties in various industries, including technology, finance, and trade. This relationship is reinforced by regular business collaborations, investment flows, and bilateral agreements.

3.5 Back up / Redundancy Option for Singapore
The proximity between Perth and Singapore also enhances their connectivity and facilitates business interactions. Perth’s geographic location near the Asia-Pacific region makes it an ideal location for organisations seeking to establish Data Centres that can serve as a redundancy or backup for existing facilities in Singapore. With the growing demand for Data Centre services and the potential capacity constraints in Singapore, Perth offers an opportunity for organisations to expand their Data Centre operations while maintaining connectivity to the APAC region.

By leveraging Perth’s geographic attributes including reduced risk of natural disasters, political stability, super low per MW power pricing and global connectivity, organisations can establish cost effective redundant Data Centres in Perth to enhance the overall resilience and availability of their operations, particularly when high-capacity areas like Singapore are at their limits. This added redundancy can help ensure uninterrupted Data Centre services and protect against potential disruptions in critical multi region business operations.

3.6 Strong Infrastructure
Perth has a very well-developed infrastructure, including reliable power and telecommunications networks. The city offers access to high-speed internet connectivity and robust telecommunications infrastructure, ensuring seamless data transfer and communication between Data Centres and their clients. The availability of reliable power supply is crucial for uninterrupted Data Centre operations, and Perth’s infrastructure is very well suited to support the high demands of modern AI based Data Centres.

The South West Interconnected System (SWIS) boasts a reliable power infrastructure that has demonstrated a high level of resiliency over time. It is designed to meet the energy demands of the region, including critical facilities like data centres. The infrastructure incorporates redundancy measures, backup power sources, and proactive maintenance practices to ensure a continuous and reliable electricity supply. This reliability minimises the risk of power interruptions and downtime for data centre operations.

3.7 Availability of Land and Resources
As the largest State in Australia covering 2.5 million square kilometres (approximately 10 times the size of the United Kingdom, seven times the size of Japan or four times the size of Texas), Western Australia has large expanses of land, low population density and favourable environmental conditions for Data Centre operations. Perth has ample land availability, making it conducive for the construction and expansion of Data Centres. This allows for the development of highly scalable state-of-the-art facilities
with the latest technologies and designs. WA also has access to abundant renewable energy resources, such as solar and wind power. Leveraging these resources, Data Centres can enhance their ESG, ESR whilst reducing their environmental impact.

3.8 Geographic Isolation
Perth, is one of the most isolated capital cities on earth and is therefore geographically isolated from other major urban centres and Data Centre hubs in both Australia and the Asia-Pacific region. This isolation reduces the risk of simultaneous disruptions affecting multiple locations. In the event of a localised incident or outage, such as a natural disaster or equipment failure, the SWIS's isolation can help mitigate the impact on Data Centres in Perth.

3.9 Supportive Government Settings
The Western Australia Government released its independent Data Centre Prospectus in November 2022, highlighting the State’s potential as a hub for data centre operations to global industry and investors.

The Western Australia Government recognises that developing the industry in WA will help diversify the economy, create jobs and also underpin the digital supply chain for a number of data intensive industries.

In addition, WA’s cutting-edge industries in resources, space, health, and defence, are also increasingly utilising technologies such as AI, remote operations, and robotics, which will drive large volumes of data and demand for data centres. The prospectus highlights Western Australia’s advantages for data centre investment including its:

- Safe location
- Tech savvy workforce
- Strong environmental, social and governance credentials
- Digital and big data capabilities
- Renewable energy potential through solar, wind, and tidal resources
- Connectivity to major digital global economies through four international submarine cable routes.

4. Perth (WA) has some of the lowest per MW power on Earth.
4.1 Why is Western Australia’s power so cheap?
WA offers some of the most competitive per MW power pricing on earth, making it a highly attractive location for AI Data Centres. The article "WA has the cheapest gas in the developed world" from The New Daily highlights WA’s position as the cheapest energy provider in the entire OECD.

Back in 2005, the WA government demanded the big WA gas producers such as Chevron and Woodside reserve 15% of their WA production for the local market. This means WA residents and businesses never have to compete with the international market, shielding it from global volatility. WA’s gas reserve system means that its State’s higher reliance on gas does not result in higher power prices for consumers.

This cost advantage allows Data Centres to optimise their operational expenses, making them more economically sustainable, and more able to face the increased cost to pay for the new AI servers, cooling environments and increased power of AI operations over the long run. The availability of this world’s best power pricing enables AI Data Centres in WA to offer competitive pricing to their customers while maintaining profitability.

**Case study**: according to Alinta Energy on 1 Mar 23, there is a $56m per annum saving by operating a 96MW Data Centre in Perth over Sydney, using fully loaded certified green energy. The below Table 2 identifies a $61m saving between 96MW Data Centre in Perth, versus a 96MW Data Centre in NSW.
This table shows WA power pricing per MW benchmarked against the top 10 global Data Centre markets.

![Graph showing WA power pricing per MW benchmarked against the top 10 global Data Centre markets.](image)

Table 2: By Presync. Prices in local currency converted to AUD using latest FX rates & distribution costs as at 1 March 23

According to EnergyQuest, WA electricity prices are also much lower than in the National Electricity Market (NEM) on the east coast of Australia, averaging $64 a megawatt-hour, while NEM prices were more than four times higher at an unprecedented $284/MWh in the June quarter 2022. This is a +400% differential and shows how much WA is shielded from global volatility, thanks to its 2005 gas reservation policy.

![Table showing International and Australian gas prices, June quarter 2022 ($/GJ).](image)

Table 3: Comparison of gas prices, by EnergyQuest, from ‘Paradise’: WA has cheapest gas in OECD – Sep 2, 2022 AFR article.
WA’s electricity market is at the same time less emissions-intensive than the NEM and coal powers only 38% of generation, compared with 59%, according to EnergyQuest analysis of the June quarter 2022.

### Power generation sources

<table>
<thead>
<tr>
<th></th>
<th>WA</th>
<th>Eastern states</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>38%</td>
<td>59%</td>
</tr>
<tr>
<td>Gas</td>
<td>28%</td>
<td>9.25%</td>
</tr>
<tr>
<td>Renewables</td>
<td>27%</td>
<td>23%</td>
</tr>
</tbody>
</table>

Source: EnergyQuest

#### 4.2 Cost Optimisation for AI Data Centres

AI computing requires high-performance GPU processors consume around 10x more power and generate greater heat compared to traditional Data Centre chips. The legacy Data Centres built for general-purpose computing are not designed to accommodate the power density and storage capacity demanded by AI workloads. Consequently, traditional air-cooling methods are not able to dissipate the intense heat generated by these powerful processors.

To address these challenges, innovative cooling technologies, such as liquid cooling and immersive cooling, have emerged. The article "Quenching AI’s thirst means building smarter, greener DCs" from The Register discusses how advanced cooling techniques are crucial for managing the heat generated by AI Data Centres efficiently. Operators such as GreenSquareDC with its proposed net zero, liquid cooled 96MW WAI1 Data Centre in WA will optimise energy consumption, minimise operational costs, and enhance overall sustainability.

#### 5. Renewable Energy Potential

##### 5.1 Abundance of Solar Energy Resources

Western Australia boasts abundant solar energy resources, making it an ideal location for deploying renewable energy solutions for AI Data Centres. The region’s vast landmass and sunny climate provide excellent conditions for solar power generation. The article "How data centers can use renewable energy to increase sustainability and reduce costs" from Device42 highlights the growing trend of integrating renewable energy sources, particularly solar power, into Data Centre operations. By harnessing solar energy, AI Data Centres in WA can significantly reduce their reliance on fossil fuels and lower their carbon footprint, aligning with global sustainability goals.

##### 5.2 Onshore Wind Power

In addition to solar energy, WA possesses significant wind power potential. The region’s expansive coastline and prevailing winds create favourable conditions for wind energy generation. The article "How AI and automation make data centers greener and more sustainable" by EY highlights the role of wind power in increasing the sustainability of Data Centres. By harnessing wind energy, AI Data Centres in WA can diversify their renewable energy sources, further reducing their carbon footprint and contributing to a greener energy ecosystem.
Australia is one of the windiest places on earth and WA’s wind farms once again topped the performance charts in February, a month where the nation’s wind assets helped drive a 12 per cent jump in power generated by renewables, year-on-year.

The latest monthly data from Rystad Energy reveals all Australian utility solar and wind assets generating 3751GWh, up from 3347GWh in February 2022. Rystad confirmed the best performing wind assets for the month were all located in WA, including APA Group’s Badgingarra wind farm, with a capacity factor of 54.7%, RATCH-Australia/Alinta Energy’s Yandin (53.9% CF) and Iberdrola Australia’s Walkaway wind farm (51.5% CF).

5.3 Offshore Wind Power
WA exhibits substantial potential for offshore wind energy, due to its extensive coastline, robust wind resources, and existing energy infrastructure. The region experiences consistent and strong wind patterns, particularly in its southern and western coastal areas, via the renowned ‘roaring 40’s’ offering a high-capacity factor for wind power generation.

Offshore wind, with its ability to use larger turbines and benefit from stronger, more consistent winds at sea, can generate electricity more efficiently than onshore wind farms. Additionally, WA’s experience in offshore industries, such as oil and gas, provides the necessary infrastructure, expertise, and maritime capabilities, aiding the development of offshore wind projects.

One of the promising initiatives that underscore the state’s offshore wind energy potential is the proposed "Mid-West Wind and Solar Project." This project exemplifies how WA can leverage its bountiful natural resources and technical expertise to pioneer renewable energy solutions.

5.4 Tidal Energy Opportunity
Tidal energy, although highly predictable and reliable, is typically challenging to harness due to the high costs of technology, and the necessity for specific geographic conditions, such as high tidal ranges or fast-flowing tidal streams.
However, certain regions in WA, like the Kimberley, have some of the highest tidal ranges in the world, which offer significant opportunities for tidal energy development. For instance, the Derby Tidal Power Project, is an example of tidal energy facility in the Kimberley region.

5.4 Geothermal & Aquifer Energy Availability
WA’s geothermal and aquifer energy resources offer another renewable energy option for AI based Data Centres. The region’s geothermal activity, particularly in areas such as the Perth Basin, presents an opportunity to tap into the Earth's heat to generate clean and sustainable energy. Geothermal energy has the advantage of being available 24/7 and not being affected by weather conditions. The utilisation of geothermal energy in AI Data Centres can provide a reliable and consistent power supply, ensuring uninterrupted operations and enhancing the overall sustainability of the facilities.

By way of example, CSIRO has successfully cooled the Pawsey Supercomputing Centre in Perth for over 10 years via a groundwater cooling system. This removes heat from the supercomputers and reinjects this heat into the aquifer, below the Centre, with no net loss of groundwater or perceptible impact on the aquifer. This method of cooling saves approximately 7m litres of water every year that would otherwise have boiled off in cooling towers. Pawsey is the most powerful supercomputer in the Southern Hemisphere. Pawsey was also awarded as the 4th greenest supercomputer on earth in late 2022, largely due to this groundwater cooling technique.

Pawsey presents an excellent example of High-Power Compute (HPC) operating efficiently and moving forward, AI enabled data centres will closely resemble Pawsey’s liquid cooling approach.

5.5 Sustainability and Carbon Footprint Reduction
By leveraging abundant renewable energy resources, such as solar, wind, and geothermal power, AI Data Centres in WA can significantly reduce their carbon footprint and reduce costs. The adoption of renewable energy aligns with global decarbonisation efforts and demonstrates a commitment to sustainable practices. According to the article "The environmental challenges of AI-driven data centres" from GovTech Review, the integration of renewable energy sources into Data Centres can lead to substantial reductions in greenhouse gas emissions, appealing to all organisations seeking to minimise their environmental impact.

6. Renewable and Sustainable
6.1 Robust Renewable & Sustainable Framework
As part of the Western Australian Government’s Climate Change Policy, WA is committed to delivering on its international obligations under the Paris Agreement to achieve net zero emissions by 2050. The State boasts a large land mass, abundant sunshine, and consistent winds and waves, which provide a natural advantage for companies seeking to decarbonise their operations.

The South West Interconnected System (SWIS), is on a trajectory towards being able to meet up to 100% of demand from renewable energy sources. Western Australia is very well positioned to play a central role in decarbonising the world’s economies as a significant producer, exporter and user of renewable energy.

7. Skilled Workforce
7.1 High-Quality Education System
WA benefits from a high-quality education system that nurtures a skilled and diverse workforce. Renowned Universities in the region offer programs and courses specialising in AI, data science, and
related fields. This emphasis on education prepares individuals with the necessary knowledge and skills to contribute to the development and operation of AI Data Centres. The availability of a well-educated workforce within WA reduces the reliance on external resources and fosters a thriving AI ecosystem.

Western Australia’s highly skilled workforce is at the forefront of some of the biggest global scale digital projects ranging from powerful high-performance computing to support health and medical research; to co-hosting one of the world’s largest science projects, the Square Kilometre Array; and developing internationally renowned digital capability that enables predictive maintenance, autonomous and remote site operations in the resources and energy sectors.

7.2 Specialisation in AI and Related Fields
The region’s focus on AI and related fields creates a talent pool that is well-equipped to support AI Data Centre operations. For instance, the University of Western Australia offers a Bachelor of Advanced Computer Science (Artificial Intelligence), which equips graduates with the skills and knowledge to understand, evaluate, design and implement artificial intelligence systems.

The presence of a specialised workforce in WA ensures that AI Data Centres have access to individuals with the technical knowledge and capabilities to develop, deploy, and maintain AI systems. The collaboration between academia and industry, as mentioned in the article “WA pitch to become global data centre hub” from the Australian Property Journal, further strengthens the fostering of innovation and the growth of the ICT/AI Data Centre sector in WA.

7.3 Cyber Security
WA is at the forefront of innovation in cyber security. Four of Perth’s five Universities offer comprehensive cyber security courses as well as environments for the development of cyber security applications and solutions, building a workforce of cyber capable digital graduates. Twenty percent of Australia’s cyber graduates are from WA. Edith Cowan University (ECU) Perth is a world-leader in cyber security research & education, recognised by the Australian Government as a Cyber Security Centre of Excellence and is home to:

» The national Cyber Security Cooperative Research Centre, which helps grow Australia’s capability in cyber security and deliver solutions to ensure the safety of Australian businesses online. The centre partners with leading global organisations such as INTERPOL to tackle cyber security issues.

» The WA AustCyber Innovation Hub, which accelerates cyber capability, innovation and commercialisation across critical infrastructure, cybercrime and big data.

» The southern hemisphere’s largest university Security Operations Centre, which provides students with real world training in monitoring, detecting and responding to cyber security threats.

Cyber security is also a key focus of the Western Australian Government’s strategy to drive digital transformation in the public sector and improve services to the community.
7.4 Skilled workforce building a culture of innovation.
As the world see’s an explosion of AI based technologies, WA’s world-rated educational institutions, are committed to building capabilities in science, technology, engineering, and mathematics (STEM) to secure a digitally skilled workforce for the future.

Supported by the education and training system, technology employment in Western Australia was the fastest growing in the country, expanding by nearly 16% in 2021-22, almost double the national average.

The annual growth of the State’s tech workforce over the next five years is estimated to be 5.4. WA’s universities are delivering the next generation of state-of-the-art courses ranging from cyber security, data science and information technology, to creative technologies, data analytics and computer science. WA is a major centre for international education, with around 35,000 international students travelling from across Asia alone to Perth.

8. Decentralisation of Data Centres and WA’s Advantage
8.1 The Shift Toward Decentralised Data Centre Landscape
There is a growing consensus that the widespread adoption of large language model AI will accelerate the Decentralisation of the Data Centre landscape. The article Cloud-based generative AI won’t be cheap by InfoWorld that the reality of generative AI is that it’s going to be very expensive, with upgraded high density CPUs, GPUs, storage systems and even upgrading cooling systems all being very expensive. So is the power, which is a 5x to 10x increase over traditional data centre compute/power density.

The article ‘Paradise’: WA has cheapest gas in OECD from The Australian Financial Review highlights the power pricing competitiveness of WA. As AI becomes more prevalent and Data Centres catering to AI workloads increase in number, the focus is shifting away from traditional Data Centre hubs to new markets with favourable market pricing conditions.
8.2 WA’s Favourable Environment for Decentralisation

WA’s unique attributes make it an attractive destination for Data Centre Decentralisation. The availability of cheap and green energy sources, as mentioned in the article "WA has the cheapest gas in the developed world" from The New Daily, provides a significant advantage. WA’s globally competitive power pricing allows Data Centres to optimise their operational costs, enhancing their economic sustainability.

Moreover, WA’s commitment to renewable energy, abundant solar and wind resources, as discussed earlier, positions it as an environmentally conscious location for Data Centres. The utilization of renewable energy aligns with global sustainability goals and reduces reliance on fossil fuels, making WA an ideal choice for organisations seeking ethical and sustainable AI deployments.

WA’s strategic geographic location, as highlighted in the section on Geographic Location, offers proximity to the Asia-Pacific market and direct access to international undersea fibre-optic cables. This ensures fast and reliable connectivity, reducing latency and facilitating seamless communication with other Data Centres worldwide. WA’s advantageous location enables efficient data transfer, supporting the requirements of AI workloads and driving the Decentralisation of Data Centres to the region.

9. Market Size and Potential for AI Data Centres in WA

9.1 Growth of the AI Market and Increasing Demand for Data Centres

The market for AI technologies is experiencing significant growth, with increasing adoption across various industries. The article "Generative AI Breaks The Data Center: Data Center Infrastructure And Operating Costs Projected To Increase To Over $76 Billion By 2028" from Forbes highlights the projected growth in Data Centre infrastructure and operating costs, exceeding $76 billion by 2028. As AI becomes a core component of digital transformation strategies and costs increases as a result, the demand for specialised lower cost Data Centres in lower cost power regions catering to AI workloads will continues to rise.

It should be noted, as highlighted below, that Australia’s strength is likely not to be in producing foundational LLM’s, owing to large computing and investment requirements. Rather, Australia is likely to be a global leader in applications built on top of such models.

These will still be ‘built’ in data centres and the most cost effective and sustainable location in Australia to do so is in Western Australia.

“Making the most of this opportunity will require a collaborative effort across government and industry, particularly to upskill our workforce, provide regulatory clarity and drive uptake of responsible AI practices.”
9.2 WA's Opportunity to Capture a Significant Market Share

WA has the potential to capture a significant market share in the AI Data Centre industry. The region's unique advantages, including its geographic location, super low per MW power pricing, renewable energy potential, data privacy regulations, skilled workforce, and research collaborations, position it as a highly favourable destination for AI Digital Infrastructure investment. The article "WA pitch to become global data centre hub" from the Australian Property Journal highlights WA's ambition to become a global Data Centre hub, showing its ambition grow a strong presence in the growing AI market.

By way of comparison, the Australia Cybersecurity share of GDP is estimated at $5.99 billion in 2023, and is expected to reach $13.95 billion by 2028, growing at a CAGR of 18.44% during the forecast period (2023-2028), according to Mordor Intelligence. This is approx. 11.3% the size of the proposed AI share of GDP during the same period and this should give some perspective on the likely impact of this sector.

10. Case Studies: Next Generation Data Centres for AI Workloads

10.1 Meta's Innovative Data Centre Liquid Cooled Design for AI-Powered Future

Meta, a prominent player in the technology industry, has previewed an innovative Data Centre design specifically tailored for AI workloads. The article "Meta Previews New Data Center Design for an AI-Powered Future" by Data Centre Frontier discusses Meta's advanced Data Centre architecture that leverages AI and automation to optimise performance, energy efficiency, and scalability. Meta's design incorporates intelligent cooling systems, advanced power distribution, and infrastructure management...
technologies to meet the unique requirements of AI workloads. By adopting next-generation Data Centre designs like Meta's, AI Data Centres in WA can benefit from enhanced performance, reduced energy consumption, and increased operational efficiency.

10.2 GreenSquareDC's Liquid-Cooled AI Enabled Net Zero WAI1 Data Centre
Another notable case study is GreenSquareDC's proposed liquid-cooled net zero 96MW WAI1 Data Centre, which focuses on providing highly efficient and sustainable AI enabled workloads. The article "GreenSquareDC: The future of AI-ready, ethical and sustainable data centers" by DCD highlights the liquid cooling technology and other sustainability benefits implemented by GreenSquareDC. Liquid cooling not only improves the sustainability of AI Data Centres but also allows for higher power densities and enhanced computational capabilities. The presence of GreenSquareDC with these attributes in WA can leverage quicker deployment of scalable AI workloads and achieve significant cost savings, improve environmental sustainability, and accommodate the power demands of AI workloads.

10.3 Cost Efficiency and Sustainability Benefits
Next-generation Data Centres, such as Meta's and GreenSquareDC's designs, offer significant cost efficiency and sustainability benefits for AI Data Centres. By optimising cooling mechanisms, power distribution, and infrastructure management, these Data Centres can reduce energy consumption, resulting in lower operational costs. The article "How AI and automation make data centers greener and more sustainable" by EY emphasises the role of AI and automation in improving the energy efficiency of Data Centres. AI algorithms and automation systems can optimise resource utilisation, dynamically adjust cooling requirements, and intelligently manage workloads, further reducing energy waste and costs.

The cost efficiency of next-generation Data Centres and WA’s strategic low-cost location aligns with the economic requirements to help make AI financially viable. The region’s globally competitive power pricing, as discussed earlier, enhances the financial sustainability of AI Data Centres. By incorporating advanced cooling technologies and embracing sustainable practices, WA's AI Data Centres can establish a reputation for cost-effective operations and environmental responsibility.

11. About GreenSquareDC
GreenSquareDC has been created to provide highly sustainable, affordable & scalable AI ready Data Centre solutions to Hyperscale, Government & Wholesale customers committed to tackling climate change.

GreenSquareDC's WAI1 sets a new benchmark for sustainable design and performance in the Asia-Pacific (APAC) region, aiming for a target Power Usage Effectiveness (PUE) of 1.1, a significant improvement over Australian Government published data suggesting ‘state of the art’ data centres have a PUE of 1.5 and ‘average’ data centre have a PUE of 2.5. This groundbreaking project aims to cater to customers seeking to bolster their environmental, social, and governance (ESG) initiatives, lower their Scope 1 to 3 emissions, and achieve cost savings within a highly resilient and flexible AI enabled cooling environment.

With the global demand for data continuously rising, data centres play a vital role in providing the backbone to our economic, commercial, and social lives. However, traditional data centres are also significant power and water consumers, with immense carbon dioxide emissions. GreenSquareDC's core vision centers around sustainability, and the company's “5 Pillars to Sustainability” provides a clear pathway towards achieving a true net-zero future for its customers with a goal of being water positive with no fossil fuels in operation.
12. Conclusion

In conclusion, Western Australia (WA) is perfectly positioned to participate in much needed AI digital infrastructure. Western Australia has done very well in promoting itself as a national leader in Cyber Security, with Government, Universities and Private Sector combining to the benefit of the State overall. Cyber Security is projected to be a $13.95 billion market sector by 2028 and AI is projected to be a $115 billion market sector by 2030.

The region’s strategic geographic location offers proximity to the Asia-Pacific market, while direct access to international undersea fibre-optic cables ensures fast and reliable connectivity. WA’s globally competitive power pricing is a huge benefit, as its abundant renewable energy potential contribute to cost optimisation and sustainability. The robust data privacy regulations and availability of a skilled workforce further enhance the region’s appeal for AI Data Centre investments.

By leveraging its strengths and embracing ethical and sustainable AI practices, WA can emerge as a global leader in providing highly efficient, responsible, and innovative AI Data Centre infrastructure. The combination of WA’s favourable environment, market opportunities, and cutting-edge Data Centre designs such as GreenSquareDC positions the region as an ideal destination for organisations seeking to deploy generative and large language model AI systems.
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