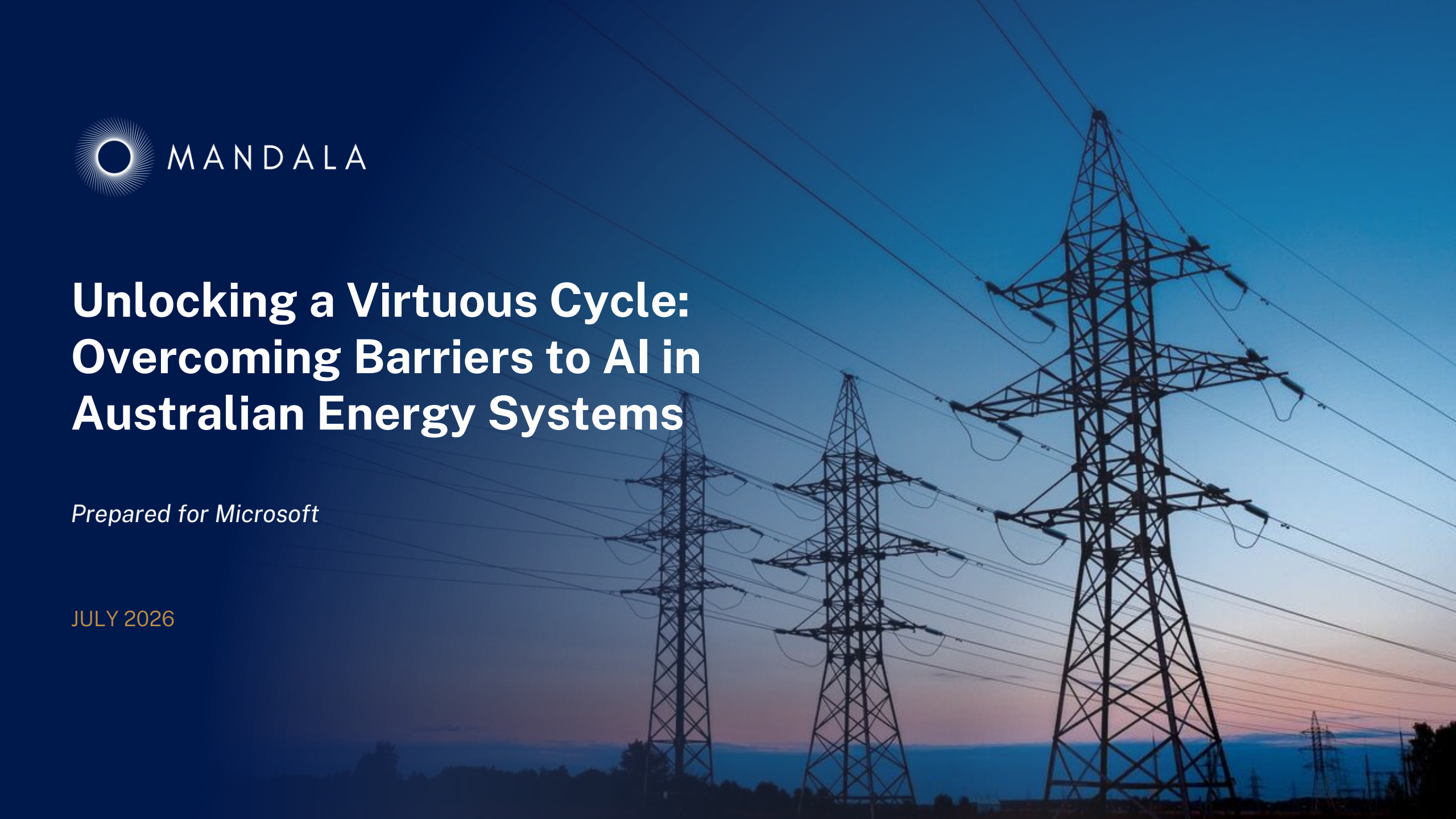
MANDALA

Unlocking a Virtuous Cycle: Overcoming Barriers to AI in Australian Energy Systems

Prepared for Microsoft

JULY 2026



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Note: All dollar figures are Australian dollars unless indicated otherwise.

Executive summary

Australia's electricity system is undergoing a profound transition. A grid built around centralised, dispatchable generation must now integrate record volumes of renewables while absorbing increased demand from data centres, electrification and consumer technologies — all at once.

AI is both a driver of and solution to this challenge. AI is undoubtedly driving electricity demand growth, as the number of data centres connected to the grid increases. However, it is also one of the few tools that can unlock material capacity and efficiencies from the existing system without waiting on new transmission and generation. Yet adoption today is incremental, not transformative, and Australia is leaving opportunities on the table.

A fundamental shift in the market is required to overcome the cultural, institutional and regulatory barriers to AI and truly unlock its potential. We have identified three key barriers which are holding the system back from more transformative applications and change.

1. Risk aversion and weak regulatory signals are driving industry hesitation around the use of AI in the grid. Reliability is paramount and the consequences of failure are visible and politicised, so operators default to proven approaches even where AI offers a better answer.

2. The revenue determination process for networks has a strong CAPEX bias that disadvantages AI investment. Network service providers recover returns through a framework that rewards physical assets, so AI — typically OPEX and software — faces heightened scrutiny and weaker incentives, even where it is the cheaper, faster solution.

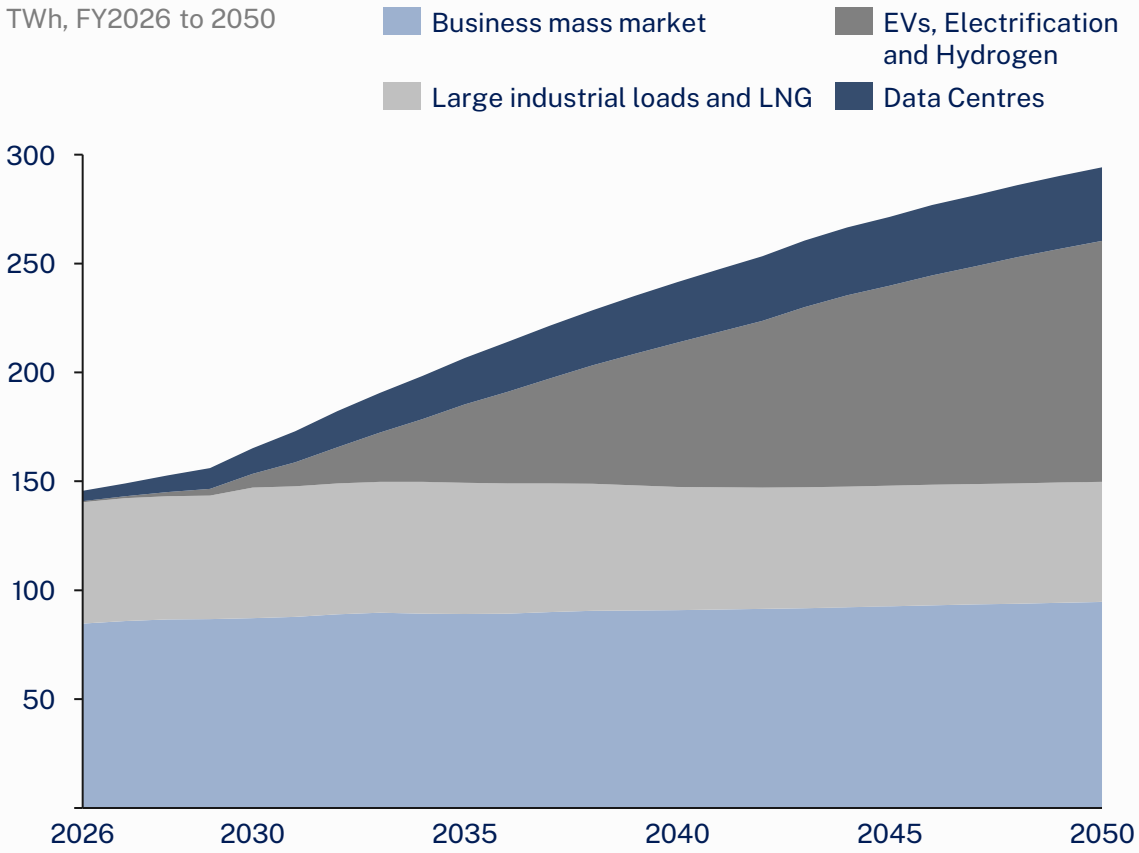
3. Data is highly siloed across the energy system, with no incentive scheme for sharing or investing in new data assets. Operational data is held by individual participants and often subject to regulatory disincentives to share, so models cannot be trained, validated, or scaled across the system.

AI in energy won't scale without joint action from government and industry. Unlocking AI's potential in the grid requires government and industry to move together — independent studies and pilots to prove AI's value, aligned policy and incentive settings to remove structural barriers, and sustained investment to carry proven pilots through to deployment.

The window is now. Electricity demand is accelerating, putting pressure on existing infrastructure, and community and political concerns are increasing, with fear that the cost is being passed to consumers. Making the case for the role of AI and demonstrating its capabilities to drive improvements in the affordability and reliability of the electricity system will be crucial in growing social licence for further build-out of data centres.

The NEM is changing. There is a significant increase in demand for electricity consumption...

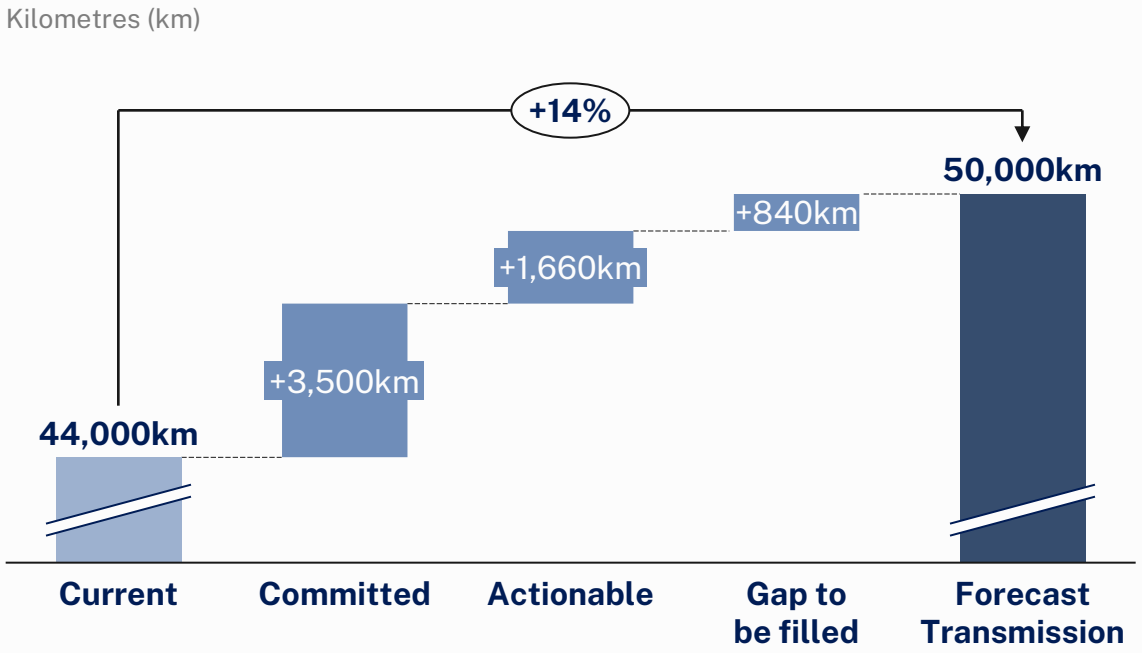
Business and industry electricity consumption



Source: Australian Energy Market Operator (2026) *2026 Integrated System Plan for the National Electricity Market*; Mandala analysis.

...requiring a costly and delayed build-out of transmission infrastructure

ISP optimal development path for the transmission network



Australia **requires 6,000km of new transmission** to meet demand, with **costs rising 3x from AEMO's 2024 ISP** – costing taxpayers an extra $600 per year, with lead times between 8-12 years.

Source: Australian Energy Market Operator (2026) *2026 Integrated System Plan for the National Electricity Market*; Policy Institute Australia (2026) *It's not too late: Getting infrastructure right for the energy boom*; Mandala analysis.

Globally there is evidence that AI can improve the capacity of the current system...

Global benefits of AI in the grid

175 GW

of transmission capacity unlocked through AI-enabled tools

450-700 GW

of large load projects connected without new infrastructure through grid-enhancing technologies

US$110B

in annual savings from widespread adoption of AI in operations and maintenance by reducing outages

5-10% reduction

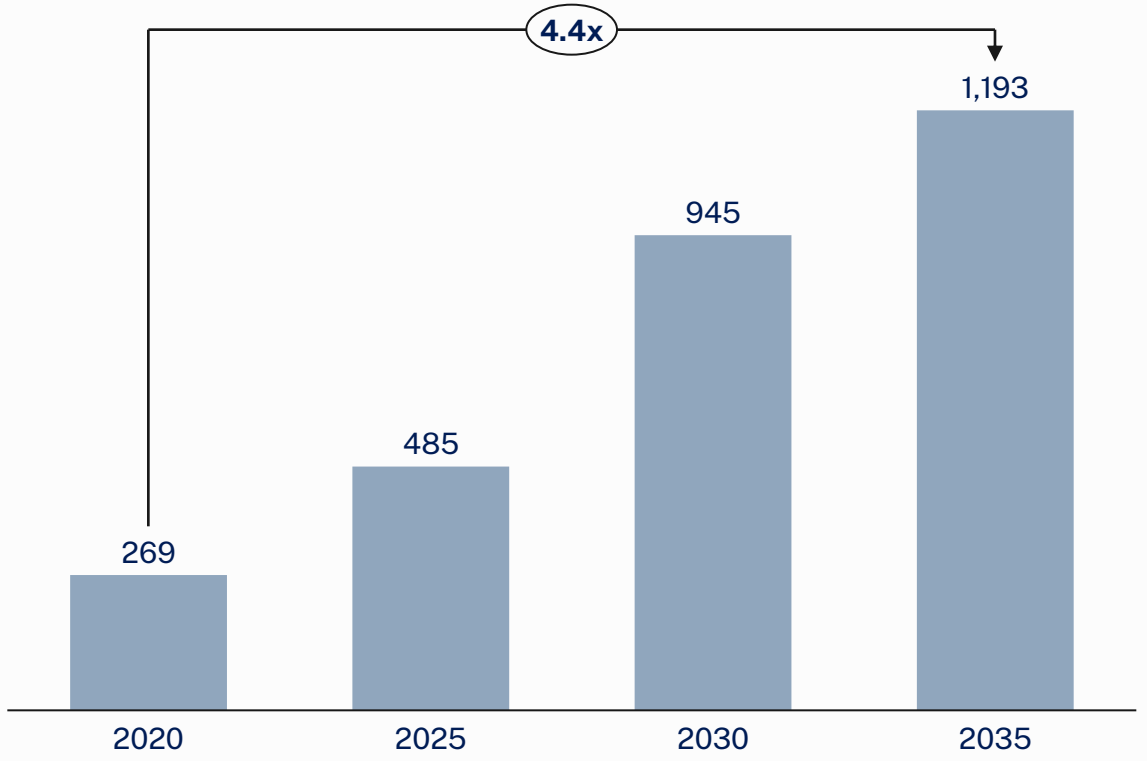
in electricity demand if AI tech was deployed widely in advanced economies

Source: IEA (2026) Key questions on energy and AI; IEA (2026) Grids; IEA (2025) Energy and AI

...which can help support the additional capacity required for data centres without new infrastructure investment

Global forecast data centre electricity consumption

TWh, 2020-2035



Source: IEA (2026) Key questions on energy and AI

To achieve the energy grid of the future, we will need to make a fundamental shift to AI use cases that transform, not augment, processes

		Today's energy grid	Future energy grid
		Dispatches generators to deliver stable, reliable electricity, in a system that is human-driven, static and rules-based	*Matches distributed supply and demand in real time, delivering efficient, low-carbon power in an AI-driven and adaptive system*
System characteristics	Centralisation	One way, centralised	Two way, decentralised
	Purpose	Predictability and stability	Responsiveness
	Generation mix	Small number of large generators	Large number of small, distributed, variable assets
	Data type needed	Historical	Real-time and high-frequency
AI usage behaviour	Uptake	Low	High
	Sophistication	Low – AI augments human workflows	High – AI runs the system, humans set the strategy
	Application	Narrow and task-specific	Whole-system, real time optimisation
Factors driving AI usage	Perception of use	Cost-saving tool	Source of competitive advantage
	Literacy	Skeptical and hesitant, limited execution know-how	AI-native — fluent, confident, experimental
	Data availability	Siloed and treated as a by-product	Strategic currency — open, monetised
Barriers behind AI usage	Culture and skills	Incumbents are wary of ceding decisions to machines	Future grid can't run on today's rulebook — the system needs to be redesigned around real-time operations, distributed participation and continuous AI-driven decisions
	Regulation and market design	System constrains data sharing, asset participation and investment in AI	

Source: Mandala analysis

The use of AI across the Australian market is varied, but most current use cases are incremental rather than transformative in nature

AI use cases range from incremental to transformative

	Commonly observed use cases today		
Generators	**Predictive maintenance** AI continuously analyses sensor data from plant equipment to **forecast failures before they occur**. This **keeps thermal and renewable capacity online during peak demand.**	**AI-driven forecasting for renewables** AI forecasts generation, demand, prices, and weather to **sharpen dispatch and bidding into the NEM and WEM**. More accurate forecasts **reduce balancing costs and revenue lost to curtailment.**	**Energy trading** AI makes real-time operational and trading decisions with minimal human input. Faster, finer-grained response **tightens price signals and improves dispatch efficiency.**
Network Service Providers	**Vegetation and asset management** AI fuses drone, LiDAR, and satellite imagery with sensor data to **pinpoint defects and vegetation risks** across the network. This **reduces outages and unplanned interruptions.**	**Distributed Energy Resources (DER) orchestration** AI coordinates rooftop solar, EV charging, community batteries, and flexible loads. This defers network augmentation.	**Self-healing autonomous grids** AI-enabled grids automatically **detect, isolate, and re-route around faults**. This **shortens outage duration and reduces customers affected per event.**
Retailers	**AI-powered customer service** AI automates customer interactions, billing, and collections across digital channels, **resolving routine queries without agent involvement, lowering cost to serve.**	**Personalised energy insights** AI analyses consumption and behavioural data to tailor tariffs, offers, and nudges. This **allows retailers to send behavioural nudges that shift load away from system peaks.**	**AI-native "energy-as-a-service" ecosystems** Retailers evolve into AI platforms that manage customers' generation, storage, and appliances. By **aggregating into dispatchable capacity**, they **defer transmission build** at a system level.

Source: Mandala analysis

1 AI will be a vital unlock as Australia shifts towards the electricity system of the future

2 **A fundamental shift in the market is required to overcome the cultural, institutional and regulatory barriers to AI**

3 Government and industry must work together to unlock the virtuous cycle of AI in energy

4 Appendix

There are three key barriers to transformative adoption of AI in the Australian energy system

	1 There is no shared ambition or strategy on AI adoption	2 Market incentives for AI investments are weak	3 Data is siloed and cumbersome to access
DRIVERS	• **Risk-based lens:** The market views AI through a risk-based lens, in part due to its classification as critical infrastructure, and has not defined a strategy around AI's potential. Similarly, cloud computing, the critical underlying infrastructure of AI, was viewed in a risk-based framework. • **No clear signals from market bodies:** Key market bodies have not provided clear guidance on their positions on the role of AI, or frameworks for its use • **Industry leaders are unclear on where to start:** Leaders are conceptually keen, but don't have a clear pathway towards deployment	• **The bar for investment in AI is high as the sector is highly regulated:** Expenditure and investment of network businesses is a highly regulated process operating on 5-year cycles • **System bias toward capital expenditure**: While some efficiency incentive schemes exist, there is a strong bias toward CAPEX over OPEX • **Scale of market is small:** Australian utilities lack a scale which typically supports AI deployment • **Higher levels of concentration:** NSPs are regulated monopolies which may stifle innovation	• **Lack of data sharing incentives or mechanisms:** Existing regulations and governance do not encourage free exchanges of data among participants in the energy market • **Energy data is sensitive:** Household energy information is sensitive and there is higher scrutiny around data privacy and data sovereignty
OUTCOME	• **Hesitation around AI deployment:** No one wants to be a first-mover in an inherently risk-averse system, but this is causing incremental change	• **The bar for investment is higher for AI:** the ROI on AI use cases needs to be incredibly strong and highly reliable for firms and the regulator to approve the investment	• **Constrained potential of AI applications:** No market participants have access to a full and broad picture of the system. This limits the training and deployment of highly innovative, grid-optimising solutions

We **have not identified hard regulatory barriers** preventing AI adoption in Australia's power systems market. Instead, there are **soft barriers creating a culture that disincentivises the adoption of transformative and scaled AI.**

Source: Stakeholder consultations; Mandala analysis.

Risk aversion and a lack of clear regulatory signals are driving industry hesitation around the use of AI in the energy grid

Underinvestment in AI, particularly for transformative applications, is being driven by inertia among energy players. There are three contributing factors – a risk-based lens of AI, a lack of clear policy direction and a lack of understanding on how to deploy AI.

	Risk-based lens	Lack of clear policy signals	Limited AI deployment capability
THE PROBLEM	AI is assessed through a risk-based, rather than opportunity-based lens, favouring lower risk use cases	Regulatory bodies have not provided clear frameworks and guidance on the role of AI in the energy sector	Industry leaders are conceptually keen, but do not have a clear blueprint of successful AI deployment in the energy grid
CONTRIBUTING FACTORS	▪ **Critical infrastructure:** The energy sector is innately averse to risk due to its vulnerabilities as critical infrastructure ▪ **Existing governance frameworks:** Energy providers in Australia are subjected to high compliance requirements, which are designed around mitigating risk	▪ **Light-touch reg:** Australia relies on existing frameworks for AI governance with guidance on applying these to specific energy use cases still developing ▪ **Limited understanding of benefits**: There is a lack of research into the benefits of AI in Australia's energy grid and the NEM	▪ **Limited skills and literacy:** Industry is lacking guidance and experience on how to align AI with existing regulation ▪ **Legacy infrastructure:** Ageing assets and legacy technology add complexity in integrating modern IoT devices and modern technology stacks
WHAT INDUSTRY IS SAYING	"We have to take a cautious approach. There are lots of proof of concepts, checkpoints and processes to ensure we have appropriate oversight before we implement [AI]."	"The regulatory obligations that we have don't explicitly prohibit the use of AI, they raise the bar in terms of our ability to monitor and assure AI performance and security"	"We have assets that are 100 years old through to brand new cutting edge devices. We need to ensure [AI] can function with that full spectrum of complexity"
WHAT OTHER COUNTRIES ARE DOING	In 2024, then President Biden identified four priority use cases where AI should be immediately deployed to improve the grid, such as grid planning	The European Commission is publishing a strategic roadmap to accelerate the rollout of AI in key areas of energy such as grid optimisation, energy efficiency and demand-side flexibility	The European Commission's 'GENAI4EU' initiative contributes to the development of novel use cases in energy, and is also implementing AI factories, testing facilities and sandboxes

Source: US Department of Energy (2024) AI for Energy: Opportunities for a modern grid and clean energy economy; European Commission (2024) AI and Generative AI: Transforming Europe's electricity grid for a sustainable future; European Commission (2026) Digitalisation of the energy system; European Commission (2026) European AI Office; Stakeholder consultations

Network providers' AI investments face heightened scrutiny under a system that demands certain and prudent returns tied to reliability

Each factor builds a layer of complexity towards an investment case for AI

INVESTMENT FACTORS	DESCRIPTION	IMPLICATIONS FOR AI ADOPTION
NSPs are risk averse and prefer long-term stable returns tied to reliability	▪ Preference to avoid solutions that have greater variability in outcomes, even if lower expected cost ▪ Innovative OPEX solutions are perceived as higher risk due to greater revenue uncertainty	• Use cases that provide revenue certainty and maintain service standards (e.g. lower outages, fewer faults) are favoured
+ Incentive schemes reward cost efficiencies but punish expenditures that do not align with performance measures	▪ Incentive schemes reward efficiency savings and penalise losses ▪ STPIS reward NSPs for service performance that exceeds targets. There are two targets – minimising unplanned outages and improved capability with existing network assets	• NSPs are incentivised to grow their asset base with some incentives to reduce both OPEX and CAPEX • To combat this, similar geographies have launched innovation funds to de-risk investment in AI (e.g. UK's Strategic Innovation Fund, California's EPIC fund)
+ Returns on capital expenditure make up the majority of NSPs' revenue allowance	▪ Electricity networks are capital intensive with large asset bases. ▪ The AER's revenue setting approach compensates NSPs for the financing cost (return on capital) and consumption (depreciation) of these assets	
+ NSPs must explain the efficiency and prudency of their expenditure in the revenue determination process	▪ The AER sets a revenue cap that NSPs can collect from consumers ▪ The AER only approves expenditures that they consider to be cost efficient, prudent and in the long-term interest of consumers	• Investments in AI must have a clear objective and be proven as the most cost efficient and prudent way of achieving objectives
+ NSPs are natural monopolies with higher levels of concentration and lower market scale in Australia	▪ There are 20 network service providers in Australia that serve 11 million customers compared to: ▪ ~3000 DNSPs supplying ~150 million customers in the US ▪ ~2500 DNSPs supplying ~250 million customers in the EU	• Lack of market scale and higher concentration limits the full potential benefit of AI deployment and constrains innovation

Source: AER (2023) Review of incentives schemes for networks: Final decision; AER (2024) State of Energy; US Department of Transportation (2025) Electric Utilities; GEODE (2026) The EU DSO Entity; Innovate UK (2026) Ofgem Strategic Innovation Fund

Across the energy system, data is highly siloed, held by individual market participants with no incentive scheme for sharing

Types of data used by energy players

AI relies on high volumes of real-time, high quality data in order to reach its full potential. Creating secure environments that enable data access and interoperability is key to encouraging AI deployment in energy.

DATA TYPE	OWNER	SHARED OPENLY
Wholesale market data *Generator output, dispatch, pricing*	**AEMO** (shared in 30-minute increments)	✓
Low voltage network data *Power flows at street level*	**DNSPs**	✗
Metering data *NMI-level smart meter consumption data*	**Metering Coordinators** (some data also held by retailers and AEMO)	✗
Consumer Energy Resources *Roof-top solar and batteries*	**Retailers** (as CDR holders)	✗

Source: Stakeholder consultations; Mandala analysis.

Current regulatory barriers to data sharing

Specific regulations

- **Chapter 7 of the National Electricity Rules**: Interval metering data can only be provided to specific people and for specific purposes; no general right of access
- **Privacy Act:** Smart meter data at the NMI level is personal information, requiring consent for collection, applying to all parties in the value chain, limiting ability to on-share

Regulatory challenges

- **Jurisdictional inconsistency:** smart meter rollout and data access vary by state in the NEM – for example, Victorian DNSPs have access to smart meter voltage data but NSW does not
- **No statutory obligations on DNSPs to share data:** No requirements to collect or publish granular low-voltage network data, even as part of the annual planning process

> ***We now have more data than ever, but it isn't being fully utilised.***
>
> - Kerry Schott, former Energy Security Board Chair[1]

Note: 1 iTwire (2020) Energy Security Board consulting on energy sector reform
Source: Mandala analysis.

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Across these barriers, we believe there are six areas where there is strong potential for industry to support meaningful change to the uptake of AI in energy

BARRIERS		ADDRESSABLE	CREDIBLE	POTENTIAL TO DRIVE CHANGE
1 Data is siloed and cumbersome to access	***Lack of data sharing incentives:*** *Low policy incentives for players to exchange data*	✓	✓	High
	Energy data is sensitive: *Higher scrutiny around privacy creates access barriers*	✗	✓	Low
2 Market incentives for AI investments are weak	**The bar for investment in AI is high as the sector is highly regulated:** Network businesses must have expenditure approved by regulators	✓	✓	High
	System bias toward capital expenditure: There is a strong investment bias toward CAPEX over OPEX	✓	✗	Medium
	Scale of market is small: Australian utilities lack a scale which typically supports AI deployment	✗	✗	Low
	Higher levels of concentration: NSPs are regulated monopolies which may stifle innovation	✗	✗	Low
3 There is no shared ambition or strategy on AI adoption among players	**Risk-based lens:** The market has not defined a strategy around AI's potential	✓	✓	High
	No clear signals from market bodies: Key market bodies have not provided clear guidance on AI and its use	✓	✓	High
	Industry leaders are unclear on where to start: Leaders don't have a clear pathway towards deployment	✓	✓	High

The barrier is addressable
The barrier is regulatory, institutional or cultural; not fixed or structural

+

The sector has the credibility to act
The sector has the standing and expertise to advocate, or can partner with organisations who do

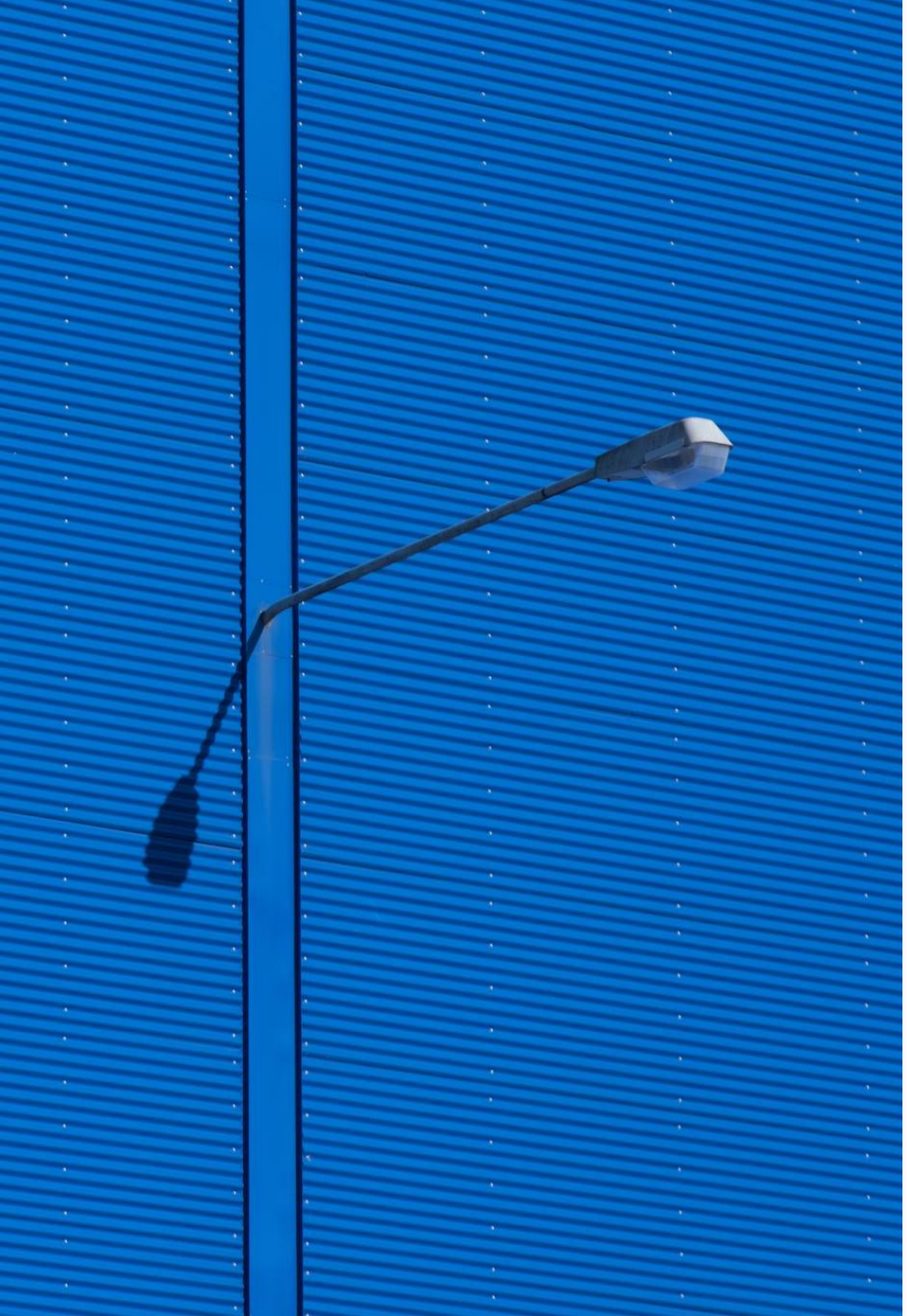
=

High potential for industry to drive meaningful change

Source: Mandala analysis

However, AI in energy won't scale to the level or at the rate required without joint action from government and industry to address these barriers

	Government *DCCEEW, AEMC, AER, AEMO*	**Tech Industry** *AI vendors, cloud providers*	***Utilities*** *NSPs, generators, retailers*
ROLE	Set the national position and back it with funding and regulation.	Bring the pilots and evidence base the sector doesn't have yet.	Test AI on live assets and make the case for TOTEX over CAPEX.
PRIORITY OPPORTUNITIES	• **A market study** on AI's current role, deployment levels and opportunities to scale. • **A clear national policy position** on AI in the electricity system. • **Adapted regulatory settings** around data sharing and regulated funding models to support uptake. • **A mechanism to fund innovation** through an AI in Energy Fund or similar, as seen in California and the UK.	• **Education for the sector** by developing a roadmap backed by pilots, ROI, reliability and security evidence and upskilling energy utility leaders. • **Practical input** into policy and regulatory submissions, directly and by contributing to the work of peak bodies. • **Sustained partnership** — funding and technical support as pilots scale into deployment.	• **Participation in pilots** and sharing back operational data, performance results and lessons as evidence. • **Practical input through peak bodies** to help in grounding advocacy in day-to-day operating reality. • **Advocacy for regulatory reform** around TOTEX and data-sharing as the parties directly affected by both and therefore most influential.



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4 **Appendix**

The research was driven by desktop research and expert interviews, with a constant validation loop between the two

Informs understanding

Desktop Research

We consulted:

- Various **AEMO, AEMC and AER** documentation and data
- Relevant **legislation and policies**
- **International case studies** and policy responses
- **Global analysis** on AI and energy
- **Submissions** from market participants to regulatory processes
- **Peak body** reports and documents

Expert Interviews

We spoke to 14 stakeholders, including:

- One **policy agency**
- One **market governance body**
- Five **market participants** (across generators, NSPs and retailers)
- Four AI **solution vendors**
- Three **broader industry experts**, including lawyers, consultants, etc.

Validates findings

Two distinct markets operate in Australia, the NEM and the WEM, with minimal overlap in the key players

		National Electricity Market (NSW, QLD, VIC, SA, TAS, ACT)				Wholesale Electricity Market (WA)			
	Stakeholder category	~9M households & small businesses	~650 registered market participants	~200 terawatt hours traded in FY25	~$25B market value in FY25	~1.2M households & small businesses	~100 registered market participants	~18 terawatt hours traded in FY25	~$1.6B market value in FY22[1]
Market governance	Rule-maker	Australian Energy Market Commission				Energy Policy WA			
	Regulator	Australian Energy Regulator				Economic Regulation Authority			
	Operator	Australian Energy Market Operator							
Generators	Conventional generators	~100 conventional generators				~30 conventional generators			
	Renewable generators	~120 renewable generators				~20 renewable generators			
Regulated networks	Transmission	5 TNSPs (1 per state)				1 TNSP			
	Distribution	13 DNSPs				2 DNSPs (one urban, one regional)			
Retailers	Retailers	40-50 retailers				<10 retailers, with Synergy as a monopoly retailer for households and small businesses			

Note: 1 FY22 is the latest year a market value has been published for the WEM. For a more detailed overview, see State of the Energy Market (2025) and WEM Operational Effectiveness Report (2025)
Source: AEMO (2026) Wholesale Electricity Market; AEMO (2026) National Electricity Market

Australia's energy market governance provides strong institutional independence, but sometimes at the cost of co-ordination and speed

National | NEM only | WEM only

Policy-makers
Set the policy direction

Energy & Climate Change Ministerial Council
Brings together Ministers from the Commonwealth and States and Territories to set the strategic direction for the energy system and national reform agenda.

Department of Climate Change, Energy, Environment and Water
Translates the priorities into federal legislation, funding programs and policy frameworks that set the guardrails for the system

State-based policy departments
Set energy policy for the jurisdiction, particularly for retail markets, NSPs and planning approvals. Also have own Net Zero targets and investment programs.

DCCEEW (NSW), DEECA (Vic), DEPW (Qld), DEM (SA), DEMIRS (WA), DNET (Tas)

Rule-makers
Make the rules

AEMC
Writes and maintains the National Electricity Rules and National Gas Rules. It's independent of government and can only change rules through a formal consultation process.

Energy Policy WA
Develops the rules and procedures that govern the WEM, effectively acting as the WEM's equivalent of the AEMC.

Regulators
Enforce the rules

AER
Enforces compliance with the National Electricity Rules and National Gas Rules across the NEM, regulates the revenue and pricing of electricity and gas networks, and protects retail consumers.

ERA WA
Performs an equivalent role in Western Australia, regulating electricity and gas networks, setting network access terms, and overseeing aspects of the WEM.

Other state-based regulators
Administers local retail energy regulation, price monitoring and licensing within the jurisdiction.

IPART (NSW), ESC (Vic), QCA (QLD), ESCOSA (SA), OTTER (Tas), ICRC (ACT)

Operators
Operate the market

AEMO
Operates the NEM and WEM in real time, dispatching generators, balancing supply and demand and setting clearing prices. Plans and manages the long-term security and reliability of the power system.

Advocates
Shape the market

Australian Energy Council
Peak industry body for major generation and retail businesses in the electricity market.

Energy Networks Australia
National industry body representing electricity transmission and distribution networks.

Energy Consumers Australia
National voice for household and small business energy consumers, with a focus on ensuring equity, value, agency and justice.

Clean Energy Council
Peak body for the renewables and clean energy industry, working to accelerate the clean energy transition.

Source: Mandala analysis

Australia's energy markets are governed by the National Electricity Law and the Electricity Industry Act for Western Australia

	Governing legislation	Description	Stakeholders responsible	Implications for AI
 **National Electricity Market** QLD, NSW, ACT, VIC, TAS, SA	National Electricity Law	Statutory powers ensuring the price, quality, safety, reliability and security of electricity supply	Energy & Climate Change Ministerial Council	Decisions about AI investments must support the National Electricity Objective
	National Electricity Rules	Governs the market arrangements for the commercial exchange of electricity	AEMC makes and amends the rules, AER is responsible for monitoring and compliance, AEMO is responsible for operating the market	AI tools must comply with the NER's forecasting, dispatch and security frameworks, incl. how data is consumed or generated
	National Energy Retail Law	Regulates the sale and supply of gas and electricity from retailers and distributors to customers		AI must not undermine consumer protections or competition among providers e.g. algorithmic collusion
	National Energy Retail Rules	Provides detailed information about consumer protection measures, model contract terms and conditions		AI must comply with transparency, comparability and informed consent rules
 **Wholesale Electricity Market** WA only	Electricity Industry Act	Establishes Western Australia's Wholesale Energy Market	Energy Policy WA	The WEM has a considerably smaller scale than the NEM which impacts AI deployment
	Electricity System and Market Rules	Governs the operation of the WEM, including roles and functions of governance bodies	ERA is the independent regulator for the WEM, AEMO is the operator	The WEM has an energy and capacity market, which lowers the need for real-time trading and bidding AI use cases

Source: AEMO (2026) About the Wholesale Electricity Market; Government of WA (2025) WA Energy Legislation; AEMC (2026) Legislation; AEMC (2026) National Electricity Rules; AEMC (2026) National Energy Retail Rules; AEMC (2026) National energy governance

Both markets are governed by common legislation around critical infrastructure and privacy which introduces further stakeholders

	Governing legislation	Description	Stakeholders responsible	Implications for AI adoption
Critical Infrastructure	Security of Critical Infrastructure (SOCI) Act	Protects information about critical infrastructure assets, disclosures must comply with SOCI Act.	Department of Home Affairs	Energy assets are considered critical infrastructure. Data used for AI must comply with disclosure and security rules.
Privacy	Privacy Act and Australian Privacy Principles	Regulates how personal information is collected, stored, used and disclosed.	Office of the Australian Information Commissioner	AI-derived insights about individuals are considered personal information and must comply with APPs and consent obligations.
	Consumer Data Right (CDR)	Allows consumers to securely share their data (e.g. energy consumption, charging) with accredited providers.	Australian Competition and Consumer Commission, DCCEEW (energy only)	Enables retailers and other players to share consumer level data with consent. Does not allow for large-scale data sharing.
Consumer	Competition and Consumer Act	Contains the Australian Consumer Law and protects consumers from misleading conduct and unsafe services.	Australian Competition and Consumer Commission	AI-driven tools must avoid deception, clearly communicating their nature and authority.
Equity	Anti-Discrimination Laws	Prohibits unfair treatment across public life based on protected characteristics such as age, sex, race and disability.	Attorney General's Department	AI must mitigate bias and treat all users equitably.
Employment	Work Health and Safety Act	Provides a nationally consistent framework to secure the health and safety of workers and workplaces.	Department of Employment and Workforce Relations	AI algorithms and automations used to allocate work must comply with WHS duties.

Source: Department of Home Affairs (2024) Security of Critical Infrastructure Act 2018; Attorney General's Department (n.d.) Privacy; DCCEEW (2024) Consumer Data Right for Energy; Australian Government (n.d.) About Australian Consumer Law; Attorney General's Department (n.d.) Australia's anti-discrimination laws; Safe Work Australia (n.d.) Model WHS laws

NSPs must undergo a revenue determination process to determine what expenditure can be recovered from consumers, which has a strong CAPEX bias

As regulated monopolies, the AER sets a maximum revenue allowance that transmission and distribution providers can recover from consumers over a five-year period. This is set through a process called Revenue Determination.

AER publishes a framework and approach paper

NSP lodges a revenue proposal to AER

AER holds Public Forum and publishes Draft Decision

NSP lodges a revised revenue proposal

AER publishes Final Decision and Determination

NSP makes actual expenditure decisions over five years within controls

The maximum revenue allowed for a provider is determined by its expenditure forecasts and a rate of return set by the AER

CAPEX (~70% of allowed revenue)

Return on Capital	Depreciation
Rate of Return (WACC) set by AER x Regulatory Asset Base (RAB)	Annual allowance to reflect wear and tear on RAB

OPEX (~30% of allowed revenue)

Operating Expenditure	Tax
Expenditure to plan, operate, maintain and support network	Corporate income tax

The bias toward CAPEX among energy players is widely recognised. Globally, countries have either adopted (UK) a total expenditure (TOTEX) model or discussed adoption of TOTEX (EU) to encourage digitalisation investments. In Australia, the AEMC has conducted reviews in 2018/19 into expenditure bias and how it impacts consumer prices.

Once the maximum revenue is set, incentive schemes reward providers for maintaining service quality while spending less than forecast

Incentive schemes

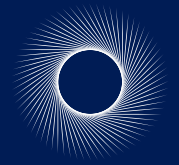
Efficiency Benefit Sharing Scheme	Allows NSPs to retain 30% of the benefit from outperforming OPEX forecasts over six years, and incurs the loss if costs exceed forecasts.
Capital Expenditure Sharing Scheme	Similar to EBSS but for CAPEX. However, overspends can be rolled into RAB and recovered through future network tariffs if found to be efficient and prudent.
Service Target Performance Incentive Scheme	Rewards NSPs that outperform service targets and penalises those that fall short. Ensures cost cutting from EBSS and CESS don't come at the expense of quality.

Source: AER (2023) Review of incentives schemes for networks: Final decision; AER (2024) State of Energy; Powerlink Queensland (2024) Revenue Determination – An Overview; AEMC (2018) Incentives faced by Network Service Providers; European Commission (2024) AI and Generative AI: Transforming Europe's electricity grid for a sustainable future

This is a widely recognised issue constraining the potential of the grid, both in Australia and internationally

Active conversations			Global examples	
Mandating low-voltage data visibility	**Changes to metering data**	**General sharing of data**	**EU Common Energy Data Space[5]**	**UK Smart Meter Data Access Reform[6]**
▪ Integrated Distribution System Planning (IDSP) rule change process is looking to establish a framework for low-voltage network reporting[1] ▪ RACE for 2030 research project to improve ability to measure and observe the low-voltage network[2]	▪ AEMC made a determination in late 2024 to achieve universal smart meter deployment with mandated rights for DNSPs to access basic data[3]	▪ ARENA has pitched an Open NEM Model to the AEMC to improve access to power system data in the NEM[4]	▪ The Common European Energy Data Space (CEEDS) is a pillar to enable secure, interoperable, trusted, and resilient data exchange among stakeholders of the European energy system and is the cornerstone of the EU's strategy to digitalise the grid.	▪ Ofgem and the Department of Energy Security and Net Zero have commenced an exercise to investigate how smart meter data can be made more readily available to network participants, including through data repositories.

Notes: 1 AEMC (2026) Enhancing distribution network planning and reporting; 2 RACE for 2030 (2026) Low voltage network visibility and optimising DER hosting capacity; 3 AEMC (2024) Accelerating smart meter deployment; 4 ARENA (2026) Opening up the data behind Australia's power system; 5 European Commission (2024) European Commission advances development of CEEDS; 6 Ofgem (2026) Open letter from DESNZ and Ofgem



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