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21 July 2026

Ms Anna Collyer
Chair
Australian Energy Market Commission

Dear Ms Collyer,

Operational integration and visibility of large inverter-based loads rule change request

AEMO is pleased to submit the attached rule change request for the operational integration and visibility of large inverter-based loads in the National Electricity Market.

The rule change request responds to the increasing scale and operational significance of large inverter-based loads, including data centres, hydrogen electrolysers and other power electronics driven facilities. AEMO considers that clearer and more consistent operational visibility, monitoring, communication and information-sharing arrangements under the National Electricity Rules would support efficient market operation, secure and reliable power system management, and ultimately the interests of consumers including large inverter-based loads themselves.

The request is outcomes focused and principles based, with the intention to facilitate a constructive consultation on proportionate, flexible and technology-neutral regulatory arrangements for large inverter-based loads in alignment with related reforms across the National Electricity Market.

AEMO looks forward to working with the AEMC, market bodies, governments, network service providers, large load proponents including data centres and other stakeholders over the course of the rule change process.

Please contact Hannah Heath, Group Manager of Strategic Market Reform, at hannah.heath@aemo.com.au should you wish to discuss this proposal.

Yours sincerely,

Violette Mouchaileh
Executive General Manager, Policy and Corporate Affairs

Attachment: *Electricity Rule Change Request, Operational Integration and Visibility of Large Inverter-Based Loads*

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Electricity Rule Change Request

Operational integration and visibility of large inverter-based loads

21 July 2026

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New South Wales | Queensland | South Australia | Victoria | Australian Capital Territory | Tasmania | Western Australia

Australian Energy Market Operator Ltd ABN 94 072 010 327

Contents

1. Introduction

The purpose of the National Electricity Market (NEM) is to provide efficient, secure and reliable electricity supply to all consumers. New large inverter-based loads (LIBLs) [1] are an emerging electricity consumer cohort who also offer economic growth opportunities for Australia. Data centre development is servicing increasing demand for cloud computing, artificial intelligence, and digital services and has the potential to provide a regional hub for such services. Additionally, Australia is developing a renewable hydrogen industry to facilitate industrial decarbonisation.[2]

Demand from LIBLs has increased materially in recent years and is expected to grow significantly over the coming decade. For example, data centre demand has risen substantially since 2020 and is forecast to continue growing, reaching a 10 per cent of total NEM underlying demand in 2050[3]. AEMO is committed to supporting the efficient connection of LIBLs so that they can both realise their economic potential and provide services desired by Australian businesses and consumers while also enabling the operation of a safe, secure and reliable power system and market on behalf of all NEM consumers.

The current regulatory framework for the connection and management of loads was not designed with the nature and operational capabilities of LIBLs in mind. LIBLs are highly sophisticated and dynamic loads that can be sensitive and responsive to power system conditions. Currently many large LIBLs are connecting to both distribution and transmission networks with implications for their secure and efficient operation. Reform will enable the NEM to better service both LIBLs and consumers more broadly.

An updated operational integration and visibility framework would facilitate improved planning, forecasting, generation dispatch and reserve processes, leading to more efficient market outcomes and lower costs for LIBLs and consumers more broadly. Without these improvements, system risks and inefficiencies would increase as more LIBLs are connected, with the consequence of increasing operational risk and likely placing upwards pressure on electricity prices.

Improvements to streamline and clarify LIBL regulations can enable more uniform and predictable integration of LIBLs into the NEM. This includes aligning regulations across NSPs and jurisdictions to provide further clarity and investment certainty, facilitating efficient LIBL investments. This will support LIBL connections that can benefit the market. Stable LIBL demand can help mitigate minimum system load events which occur when solar generation from both grid scale and CER is high – like in the middle of the day, with the effect of reducing operational demand and creating power system security challenges. LIBLs, like data centres,

[1] LIBLs include data centres, hydrogen electrolysers, battery charging hubs, and other large power-electronics driven facilities.
[2] https://arena.gov.au/news/arena-shortlists-major-projects-to-scale-australias-renewable-hydrogen-industry/
[3] AEMO, 2026 Integrated System Plan for the National Electricity Market, June 2026, p. 128.

can increase underlying demand and utilise this available and uncontrollable renewable supply. Also, LIBLs are inherently controllable, with the potential to provide demand flexibility and frequency control services. A new operational integration and visibility framework for LIBLs can support LIBLs providing these services, reducing the need for AEMO to intervene to maintain security and reliability.

Harnessing the opportunities and addressing the challenges

This rule change aims to both harness the opportunities and address the operational challenges arising from the increased number of LIBL connections while also replacing and streamlining the current bespoke arrangements for managing large inverter-based loads. AEMO considers that while significant progress has been made to reform the rules to accommodate the growth in LIBL connections, further opportunities and challenges remain and evolving the framework ahead of that growth arriving will provide greater certainty for these connecting parties and improved market and operational outcomes that are in the long term interests of all NEM consumers. [4] There are four parts to this:

1. Streamlined market integration

Arrangements for the market integration of LIBLs differ across the NEM. There is an opportunity to clarify, align and streamline these requirements. AEMO is proposing to introduce consistent communications and monitoring requirements for LIBLs. These would be proportionate to their network and market impacts. AEMO is also seeking to streamline connection requirements for back-up generation.

2. Efficient investment and asset utilisation

There is an opportunity to promote investment in and use of generation and network assets through better information sharing arrangements. This includes information on LIBL demand characteristics, forewarning of significant LIBL demand shifts, and longer-term information on when LIBLs will ramp-up to their full capacity. To facilitate this AEMO is proposing:

- LIBLs, where they may materially impact networks or the market, be required to provide advance notice of foreseen and significant short-term changes in demand such that these can be accounted for in short term projected assessments of system adequacy (ST PASA) and pre-dispatch, and
- establish reporting requirements and information reporting requirements across LIBLs, networks and AEMO to manage LIBL demand

[4] For a more detailed articulation of the challenges and opportunities see: AEMO, Draft 2026 General Power System Risk Review Report, May 2026, pp. 21-40. Many of the challenges are being addressed through the AEMC's access standards package 2 rule change review: Improving the NEM access standards – Package 2 | AEMC

3. Near real-time demand management

LIBLs can rapidly shift their demand which can both positively and negatively impact networks and the market. Rapid demand shifts can support the reliable and secure operation of the market (such as in the provision of fast frequency response). However, unanticipated demand shifts can have negative impacts to both the wholesale market and local network area. To mitigate this challenge AEMO is proposing limits on the rate at which LIBLs can vary their electricity consumption where this might negatively impact network or the wholesale market operations or system security.

4. Improved management of power system events

Direct communication between LIBLs, Networks and AEMO will allow for the better management of power system events. Also, some LIBLs have the potential to support reliability and security of the NEM by running on their back-up generation during power system events. To harness this opportunity, AEMO is proposing:

- LIBLs maintain operational communication channels with networks or AEMO (depending on who has operational oversight), and
- LIBLs to respond to instructions or directions issued by networks or AEMO (under NER 4.8.9) to maintain power system security and reliability.[5]

Alignment with other reform programs

AEMO notes that other reform initiatives are also considering arrangements relevant to LIBLs, including the Federal Government's Data Centre Expectations and Australian Standards for AI, the Energy and Climate Ministerial Council's (ECMC's) work on regulatory frameworks for data centres, the AEMC's access standards package 2 rule change and AEMO's development of a market visibility framework for price-responsive resources. While these processes are running in parallel, AEMO wants to maintain consistency and alignment with these other reform programs when developing the objectives and requirements in this proposal.

Given these concurrent processes, AEMO would support a staged implementation of this rule change to facilitate the introduction of new regulations in a manner that is deliverable and co-ordinated with other reform programs. A staged approach could also allow AEMO and industry to progressively refine regulations as experience is gained and the market evolves.

[5] Note: this would only be required once other options to maintain reliability and security are exhausted and in accordance with checks and balances under chapter 4 of the NER.

2. Background and context

2.1. The characteristics of LIBLs

An inverter-based load[6] is plant that is supplied by power electronics, including inverters, converters and rectifiers. Under the AEMC's draft access standards package 2 rule, a LIBL is defined as being an inverter-based load with a nameplate rating of 30MW or greater.[7] New LIBLs connecting to the NEM have different characteristics to existing large loads as they are more likely to:

- Have multiple points of connection whilst acting as a single entity – for instance data centres often have four or even six metered connection points. Many of these connections are back-ups to ensure continued electricity if one or more connection points is out of service.
- Be more concentrated than current large loads – LIBLs connections and connection applications are often clustered in certain locations of the network. For instance, many data centres and prospective data centre connections are clustered in and around Sydney and Melbourne.
- Have controllable loads, uninterruptable power supplies (UPS), and back-up generation – which means that they can interact with (or disconnect from) the market more quickly and easily than most existing large loads.
- Have variable demand that can be difficult to forecast with the potential to change very quickly over short time periods (within seconds) or shift across data centres (potentially across NEM regions).

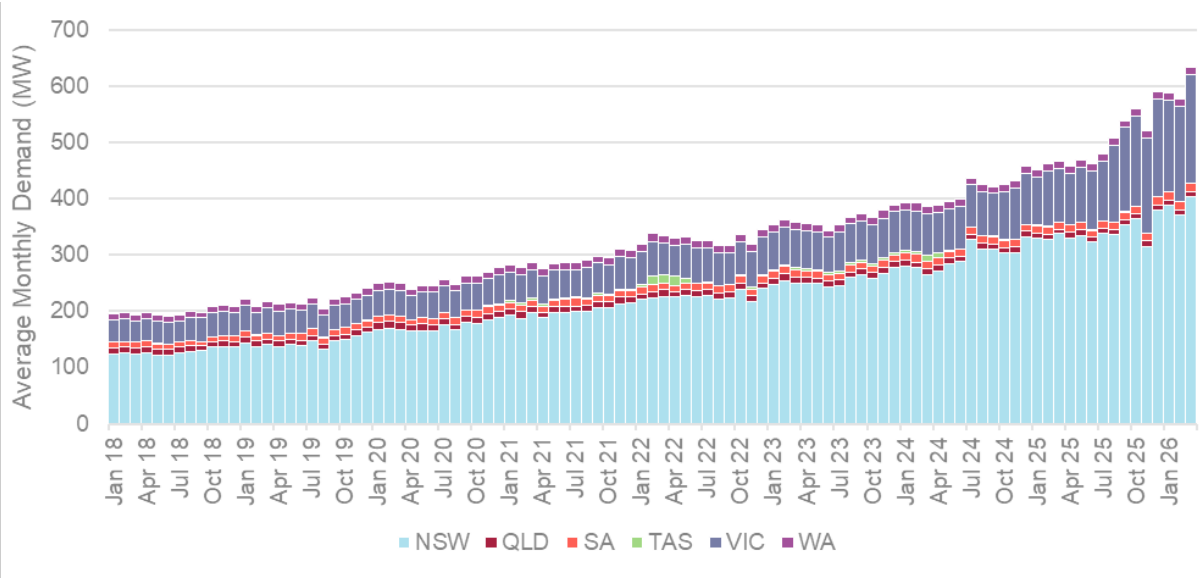
Taken together, these characteristics mean that LIBLs (including large individual LIBLs) are likely to be capable of impacting the power system security and can potentially cause cascading events.[8]

2.2. Increasing demand

LIBL demand (such as for data centres) has grown recently and is expected to increase materially over the next ten years driven in part by data centre development and the connection of hydrogen electrolysers.[9] As shown in figure 1, the electricity consumption of data centres has more than doubled since mid-2019.

[6] LIBLs are sometimes referred to as power electronic interfaced loads by industry.
[7] AEMC, Draft National Electricity Amendment (Improving the NEM access standards - Package 2) Rule 2026, March 2026, p. 26.
[8] AusNet and bespoke energy, Integrating Data Centres Prioritising power system integrity challenges in the NEM White Paper, June 2026, p.42.
[9] AEMO, Forecasting Reference Group Meeting, May 2026.

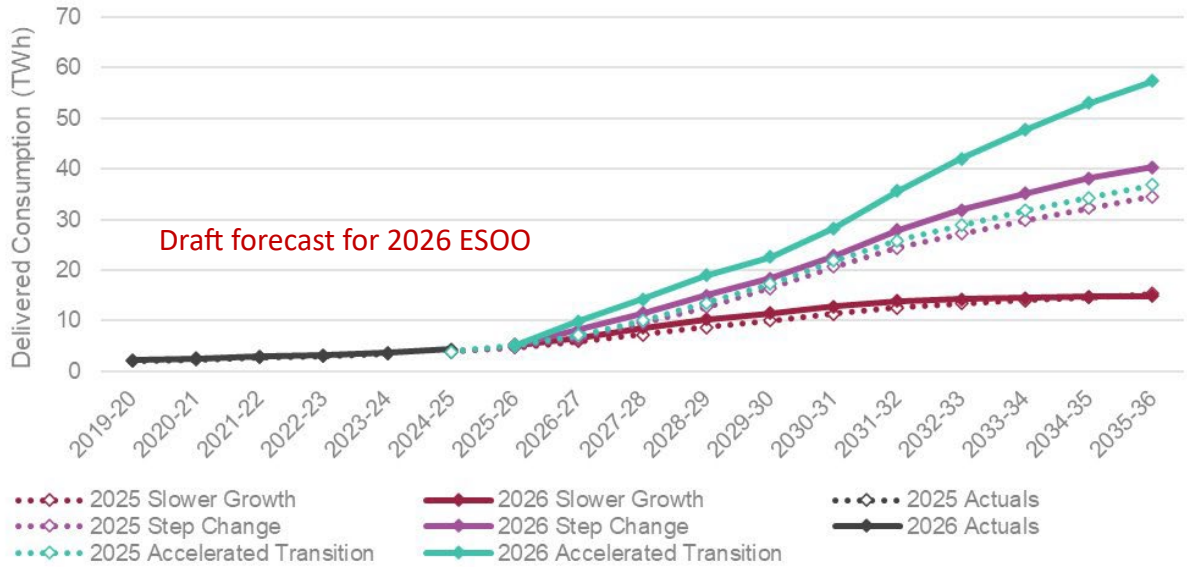
Figure 1 Average Monthly Data Centre demand by region/State



Source: AEMO analysis of all data centres identified by AEMO and/or submitted to AEMO by NSPs.

Figure 2 sets out AEMO's draft 2026 Electricity Statement of Opportunities (ESOO) forecasts of data centre consumption.

Figure 2 AEMO's 2025 and draft 2026 forecasts of data centre demand[10]



Source: AEMO, Forecasting Reference Group Meeting presentation, 13 May 2026.

[10] For more detail on AEMO's data centre forecasts and our draft updated forecasts see: AEMO, Forecasting Reference Group Meeting, 13 May 2026.

2.3. International reforms

Internationally, policy makers and system operators are pursuing similar regulations to those proposed in this rule change request. The European Union is considering mandatory reporting for large electricity users (including inverter-based facilities) on energy consumption profiles, temporal load characteristics, efficiency metrics and increasing focus on high-resolution operational data for system planning.[11] The North American Electricity Reliability Corporation (NERC) is looking to implement regulations requiring:[12]

- Real-time telemetry to operators recording voltage/frequency response trip events and oscillations.
- Registration and classification of large loads: requiring formal registration of large loads as functional entities. Registration in this context will entail meeting mandatory standards, compliance monitoring and imposing data submission obligations.
- Operational co-ordination and communications: NERC is establishing operating protocols and the necessary communication infrastructure to support reliable ongoing operations for large load facilities.

2.4. Australian reforms

The regulation of LIBLs, and data centres more specifically, is a focus of Governments across Australia. On 15 July, the Prime Minister announced that the Federal Government would introduce a legal obligation for data centres to underwrite their own new power supply, pay their full share of connection costs so energy bills are not impacted, and reduce power when needed to strengthen the grid.[13] The Energy and Climate Change Ministerial Council (ECMC) is seeking a range of specific reforms regarding the integration of data centres into Australia's energy system. In May 2026, Energy Ministers, except Queensland, agreed that data centres in the NEM should invest in additional renewable generation and firming in their state of operation to fully offset their electricity demand and provide demand flexibility services to avoid additional costs being borne by other energy users.[14] The ECMC also agreed that data centres should provide transparent reporting on their energy use and emissions production.[15]

[11] European Commission, Energy Efficiency Directive – Data Centre Reporting Framework (2024–2026), Articles 12–15 and Annex VII.
[12] See: Large Loads Action Plan
NERC, Large Loads Action Plan Q1 2026 Update Addressing an Emerging Reliability Issue, April 2026
NERC, Industry Recommendation, Large Load Interconnection, Study, Commissioning, and Operations, September 2025
[13] The Hon Anthony Albanese MP, Prime Minister of Australia, Senator the Hon Tim Ayres, Minister for Industry and Innovation Minister for Science, Dr Andrew Charlton MP, Assistant Minister for Science, Technology and the Digital Economy, AI in Australia's interests, Media release, Wednesday 15 July 2026
[14] Ref: Energy and Climate Change Ministerial Council Meeting Communique, Friday 8 May 2026
[15] Ref: Energy and Climate Change Ministerial Council Meeting Communique, Friday 8 May 2026

Figure 3 Government policies and reforms linked to the market integration of LIBLs[16]

Commonwealth	NSW	South Australia	Victoria
• Data centre Expectations • No upward pressure on energy prices • Secure new and additional clean energy generation and/or storage • Cover infrastructure costs • Improve grid security	• Developing NSW Data Centre Policy Framework • Data centres need to fund their infrastructure requirements • Desire to streamline the planning approval process	• Requirements for Data Centres • Do not negatively impact the reliability of the power system or customers • Must comply with AEMO directions • Must pay for network augmentations	• Sustainable Data Centre Action Plan • Improve access to planning data • Power data centres sustainably and integrate them smoothly into the energy system, while maintaining energy reliability and security

3. Principles

AEMO intends for this rule change request to initiate a process to consider how electricity regulatory frameworks may better accommodate LIBLs within the NEM. To this end, in addition considering the National Electricity Objective (NEO), this rule change request has been developed in accordance with the following principles.

3.1. Proportionate regulations

Regulatory obligations should be proportionate to their impact on the power system. In some circumstances this entails scaling obligations based on both the individual impact of a LIBL and its contribution to cumulative impacts at a local or regional level.

Applying only those obligations that are necessary to maintain system security, reliability and efficient market operation promotes the long term interests of consumers by minimising unnecessary regulatory burden and the costs of regulating LIBLs. This supports efficient investment in, and efficient operation and use of, electricity services, consistent with the NEO. A minimum-necessary approach also strengthens investment signals by reducing unnecessary barriers to entry for LIBLs, thereby supporting their timely connection and participation in the NEM.

3.2. Flexibility

Any new regulations should be sufficiently flexible to accommodate diverse new connecting technologies, connection arrangements and operational capabilities. Flexibility promotes

[16] Sources: Australian Government Department of Industry, Science and Resources, Expectations of data centres and AI infrastructure developers, March 2026, NSW Government, NSW Data Centre Consultation Paper, March 2026, Government of South Australia Department of Energy and Mining, Technical Regulator Guideline Requirements for Data Centres, February 2026, Victoria State Government Sustainable Data Centre Action Plan,

economically efficient outcomes by allowing participants to meet regulatory requirements through least-cost solutions.

Flexibility supports the long-term interests of consumers by allowing the framework to evolve alongside technological change and emerging system needs. For instance, flexibility may allow LIBLs to provide demand response and system services and a flexible regulatory approach ensures that the framework can adapt without the need for further review and amendment.

3.3. Clarity and consistency

Clear and consistent regulatory requirements support efficient investment in the NEM. Lack of clarity or consistency can increase compliance costs, delay connections, and create uncertainty for proponents, leading to inefficient investment outcomes and higher costs for consumers.

Clarity and consistency also underpin effective system operation by ensuring that all parties – AEMO, NSPs, and LIBL proponents – have a shared understanding of operational expectations, communication protocols, and response requirements. This improves compliance, reduces the likelihood of errors, and enhances AEMO's ability to manage system security and reliability in real time.

This principle also applies to consistency with the implementation of broader NER reforms (like the development of the market visibility framework) as well as reforms to facilitate other ECMC data centre deliverables (such as mandatory demand flexibility).

3.4. Responsibilities and interdependencies

Operational interdependence between AEMO and distribution and transmission networks are increasing with the growth in consumer energy resources, the connection of generation and BESS in distribution networks. The connection of LIBLs to distribution and transmission networks will further increase these interdependencies. Large concentrations of LIBL in distribution networks can impact transmission level operational conditions requiring improved visibility and communication protocols and clear roles and responsibilities between distribution and transmission network operators increasingly important. Additionally, transmission network capacity can constrain the size of LIBL connections that distribution networks are able to accommodate. The nature and density of LIBL connections across distribution and transmission networks needs to be considered in the formulation of network constraints. TNSPs and AEMO will require information about the aggregate behaviour of LIBLs where they affect transmission limits, constraints, contingency management, forecasting or dispatch outcomes.

As noted above, currently different approaches are taken to managing LIBL connections across networks. AEMO sees benefit in clarifying the allocation of responsibilities for supporting LIBL

connections and managing risks. This includes allocating responsibilities to the entities best placed to manage the associated risks and in a matter that reduces regulatory burden. For instance:

- Data centres should only be responsible for managing risks that they can reasonably be expected to control (e.g. how they ride-through disturbances).
- AEMO should not be involved in the negotiation and management of individual distribution network connections as AEMO's involvement at this level would likely add to the time and complexity of the process.

The allocation of responsibilities should also acknowledge the complexities and interdependencies of LIBL connections. In this context, the rules should not seek to inadvertently favour equivalent LIBL connections in different areas (for instance in the determination of transmission limits). The NER should also seek to ensure that joint risks are jointly managed (such as the cumulative impact of LIBL connections across distribution networks in the same geographic location). The NER should facilitate information sharing on LIBL connections both bottom up and top down between distribution networks, transmission networks to AEMO.

In principle, AEMO considers that DNSPs and TNSPs should be responsible for the operation of their own systems (outside of AEMO's operational zone). It would be inefficient for AEMO to manage localised distribution network security and reliability. Given the increasing operational interdependence across networks, this does require clearly defined roles, responsibilities and data sharing to enable the efficient operation of the power system as a whole. There are a range of parallel reform processes considering this division of operational responsibilities. These include the various National CER Roadmap workstreams like the distribution system operator (DSO) framework endorsed by ECMC in December 2025, the Transmission-Distribution coordination framework and associated data sharing arrangements, as well as other activities to achieve the uplift in transmission system operational capability required to support secure, reliable and efficient power system operation through the energy transition. Appropriate arrangements should be established for LIBL connections in a way that is aligned with and can be updated as necessary in accordance with these broader reforms. Given this, and the potential for some existing technological and capability gaps to meet the future state, transitional arrangements may be required that assign interim roles, responsibilities and technical and capability requirements to address the short term operational challenges while the longer term framework is determined.

3.5. Application to LIBLs

Data centres are currently the focus of many Australian government reforms. However, AEMO is proposing this rule apply to LIBLs more broadly. LIBLs share the characteristics of data

centres. The application of current NER regulations to LIBLs and the prospective application of new access standards to LIBLs[17], and similar reforms are applied internationally to LIBLs.

3.6. Forward looking application

AEMO is not proposing that this rule change apply retrospectively to currently connected LIBLs unless this is necessary to address significant security risks. Retrospectively applying rules can impose significant costs and reduce investment certainty.

4. Target rule change outcomes

The following sub-sections set out the target outcomes AEMO is seeking to achieve through this rule change request. Given the growing number of data centre connection enquiries, AEMO's approach for this rule proposal has been to leverage the AEMC's multi-stage consultation process to work through the preferred solution to address the problems identified and to achieve the target outcomes. Reform processes take time to complete and implement, so AEMO considers this principles and outcomes led approach provides the most time efficient way for stakeholders to engage on the problem statement and put forward the range of potential solutions to address.

While AEMO has undertaken targeted engagement to this request, AEMO looks forward to continue working with stakeholders over the course of the AEMC's consultation develop a framework that will best meet the NEO and deliver outcomes that are in the long term interests of consumers.

4.1. Streamlined market integration

AEMO is proposing amendments to the NER that create efficient and consistent monitoring and communication requirements for LIBLs across the NEM. Monitoring and communication requirements are obligations to provide near real-time operational data to networks and in some instances directly to AEMO. This data provides situational awareness of network conditions necessary for secure operation of the power system.

This rule change will address problems created by inconsistent arrangements across networks and provide more clarity and certainty regarding connection requirements.

4.1.1. Distribution monitoring and communication requirements

AEMO considers that DNSPs should have situational awareness of LIBLs connected to their networks that may impact their ability to manage the security of their own networks. DNSPs

[17] via the AEMC's final access standards package 2 rule change

should have an obligation to provide information to transmission networks and AEMO where it is necessary for aggregate management of risks in the NEM. In practice this means:

- DNSPs should provide information to transmission networks to ensure that they can continue to operate securely, within equipment ratings, and in compliance with voltage and stability limits. This information is also necessary to identify emerging network constraints where demand changes may materially alter power flows on the transmission network.
- AEMO should receive aggregated information for studies to assess the impact of LIBLs on its operational zone.

To this end, DNSPs should have monitoring and communication systems for prospective LIBL connections that are compatible with a range of LIBL technologies and connection configurations. These consistent requirements may vary in accordance with the LIBL tiering in the AEMC's access standards package 2 final rule:

- Tier 1 LIBLs and Tier 2 LIBLs that are assessed as not having a significant cumulative impact (SCI) to system security of the transmission system should have light-handed monitoring obligations for distribution network management.[18]
- Tier 2 LIBL that contribute to a SCI should have monitoring and communications systems that are interoperable transmission networks such that real-time data can be provided to transmission networks, and passed onto AEMO, as necessary to maintain security/reliability.
- All Tier 3 LIBL should be required to have communications and monitoring systems that provide real-time data on active and reactive power consumption, as well as connection point voltage and frequency as necessary to maintain distribution and transmission network security and reliability.[19]

This tiered approach is intended to ensure that monitoring and communication requirements are commensurate to the impact of the LIBL on the power system. Higher default requirements are warranted for Tier 3 LIBL and Tier 2 LIBL that contribute to a SCI that may impact dispatch outcomes, network constraints, and contingency management.

Significant cumulative impacts

For the purposes of this rule change request, a significant cumulative impact refers to a threshold (for example 100 MW at a bulk supply point) beyond which the combined behaviour of LIBLs may give rise to an insecure operating state.

The SCI threshold needs be determined in consultation with LIBLs and NSPs, considering network capabilities and LIBL characteristics. Ideally, the SCI framework should be clear enough that prospective connections – particularly Tier 2 LIBLs – can

[18] Noting that DNSPs will still need telemetry for their own purposes.
[19] As for tier 2 LIBL that have a SCI – this information may be passed onto AEMO as necessary to maintain power system security.

readily determine whether their connection is likely to have a significant individual or cumulative impact.

4.1.2. Transmission monitoring and communication requirements

All LIBLs connected at the transmission level must have communications and monitoring systems that provide real-time data on active and reactive power consumption, as well as connection point voltage and frequency. This is because transmission connected LIBLs will have a more direct and significant impact on the power system. This information may be a direct input in AEMO's systems[20], particularly if the LIBL provides market services or the LIBL is connected to AEMO's operational zone.

Benefits of proportionate and consistent monitoring and communication requirements

- Monitoring and communication systems underpin the efficient dispatch of generation and bi-directional plant in the NEM – placing downward pressure on wholesale market electricity prices for consumers.
- Maintaining reliability and security – proportionate monitoring and communications systems allow networks and AEMO (if the LIBL is connected to AEMO's operational zone) to clearly see system conditions and respond to changing circumstances appropriately.
- Consistency – requirements set out in the rules will make the connection and market integration process consistent across networks, clearer and more predictable for LIBLs.

4.1.3. Streamlined and consistent registration requirements

AEMO is proposing streamlined and consistent registration requirements for LIBL back-up generation. As it stands, back-up generation, depending on its configuration, may or may not need to be registered or exempted by AEMO. This process is unnecessary for back-up generation.

Benefits of streamlined connection of back-up generation

The registration requirements for LIBL with back up generation (like many data centres) can differ significantly depending on whether that generation could be connected to the NEM. If the generation can be connected to the NEM, however briefly, the connecting party must adhere to the connection requirements of generation or bi-directional plant. This means compliance with Schedule 5.2 access standards and the requirement to either register or attain a registration exemption.

These requirements are overly burdensome for back-up generation if it will not be used to export energy or provide energy services and doesn't pose system security issues in the transmission system. AEMO proposes that the NER is amended to implement a consistent

[20] Including: NEMDE (National Electricity Market Dispatch Engine), pre-dispatch PASA (Projected Assessment of System Adequacy), EMS (Energy Management System), constraint formulation tools and limit advice

lighter-handed and technology-neutral regulatory approach for the connection of back-up generation.

4.2. Efficient investment and asset utilisation

AEMO is proposing that the NER be changed to require all Tier 3 and Tier 2 LIBLs that contribute a SCI, and all transmission connected LIBLs, to:

- provide AEMO of forewarning of expected significant demand shifts so these shifts are factored into ST PASA, pre-dispatch PASA, and the NEM dispatch engine (NEMDE).
- Provide information to networks or AEMO as necessary to inform efficient long term network investment, efficient dispatch, or to maintain security/reliability. This rule change should also facilitate the timely sharing of information between networks, LILBs and AEMO to facilitate efficient market management, planning and investment.

Benefits

This additional information would improve the efficiency of market and operational outcomes and decisions. Factoring significant demand shifts into NEMDE supports the efficient dispatch of generation and bi-directional plant in the NEM – potentially reducing wholesale market electricity prices where the resulting dispatch outcome is to schedule less generation to meet a lower expected demand than would have otherwise been the case. This could also have implications for the quantum of ancillary services dispatched. It would further support the efficient management of network constraints and power system risks given the potential size of the demand shifts.

The requirement to provide information to networks or AEMO would support the efficient supply of electricity and management of power system risks by granting AEMO and networks access to information needed to understand the individual and aggregate implications of LIBL connections.[21] This includes information:

- on changes in LIBL plant, their future demand profile and expected demand growth. This would support efficient planning and timing for network and generation investment.
- to inform jurisdictional considerations regarding optimal connection locations for generation and LIBLs, and opportunities for the provision of demand flexibility.
- to inform the assessment of the SCI of data centre connections and dynamic power system studies that determine protocols for AEMO and networks to respond to power system events.
- Informing the determination of constraints such that they aren't overly conservative.

[21] AEMO currently uses network data and data provided voluntarily by LIBLs for planning purposes. However, LIBLs are under no obligation to respond to AEMO's information requests. Formal information gathering powers would compel the provision of information and provide assurance regarding the quality of the information.

4.3. Near-real time demand management

AEMO proposes amending the NER to limit how quickly LIBLs may change their demand over short timeframes (such as a five-minute period) or otherwise require mitigation of significant demand shifts. Such regulations are called 'ramp-rate' regulations.

Under the NER, ramp-rate regulations currently apply to generator and battery energy storage systems (BESS) ramp-rates. Ramp-rate regulations also apply to LIBLs overseas.[22] Some data centre operators are implementing measures to smooth ramping like workload and rack-level controls, including ramp-up caps, smoothing of short spikes, power capping, task staggering and controlled ramp-down/holds.[23] Data centres are also connecting behind BESS to help smooth their load as seen by the grid.

Fast shifting LIBL demand is desirable in some circumstances – such as riding through frequency and voltage disturbances. Certain market services also require fast shifting demand such as the frequency performance framework and the provision of frequency control ancillary services. However, rapidly shifting demand can also cause issues. Rapid demand ramping within a dispatch interval can impact the accuracy of short-term forecasting, resulting in the over or under procurement of energy and ancillary services. Large increases or decreases in demand in one region may result in interconnector drift if the surplus or deficit in demand is balanced across regions. This may result in interconnectors operating above their secure limits, or reductions in system transfer capacity (if the system needs to be operated more conservatively). Fast ramping has the potential to impact network asset lifetimes, trigger grid-scale control schemes and erode headroom on frequency control equipment and markets.[24]

Further work is necessary to determine appropriate limits and to which LIBLs the limits should apply. What may constitute a significant demand shift, in terms of change in demand over time, needs to be determined. AEMO notes that the challenges differ depending on the timeframes of the demand shift.

Table 1 Challenges and opportunities created by fast shifting demand

Timeframes	Challenges and opportunities
Short-term forecasting	Minutes to hours ahead – can affect accuracy of ST forecasts and Pre-dispatch. Forewarning of significant demand shifts will mitigate this issue (as discussed in 4.2).

[22] See: Energy Systems Integration Group Large Loads Task Force, Large Load Performance Requirements Current Practices and Recommendations, February 2026, p. 21.
[23] AusNet and bespoke energy, Integrating Data Centres Prioritising power system integrity challenges in the NEM White Paper, June 2026, p.42.
[24] AusNet and bespoke energy, Integrating Data Centres Prioritising power system integrity challenges in the NEM White Paper, June 2026, p.42.

Timeframes	Challenges and opportunities
Shifts across dispatch intervals	Matching ramp-rate capability in dispatch, so supply can ramp at an equivalent rate to load. Frequency excursions may result if there is a significant mismatch.
Within dispatch interval	Significant swings within seconds, can create frequency, voltage and power quality concerns. This can also affect the adequacy of frequency control ancillary services with the potential for consequential impacts on power system security.
Automatic response to disturbances	Fast demand responses are necessary for ride through and recovery following voltage and frequency disturbances. This is also desirable for the provision of fast frequency performance and some ancillary services – if tuned to meet the requirements of the local network.

This requirement may need to be LIBL and geographic location specific. When and how limits need to be applied should be determined:

- considering the capabilities of LIBLs to manage their demand (noting data centres may not be able to predict certain customer-driven demand shifts),
- considering the costs of LIBL plant,
- degradation of other loads, generation and network plant of mitigating the impacts of quickly shifting demand, and
- to allow for fast ramping where this is beneficial.

Benefit

Ramp-rate limits should be applied to certain LIBL because they ensure that changes in demand occur in a controlled and predictable manner, which is essential for maintaining power system security by preventing adverse network and system impacts associated with rapid load swings. This will also facilitate efficient investment in and use of power system assets by mitigating degradation of plant due to fast demand shifts.

4.4. Improved management of power system events

AEMO is proposing that transmission connected LIBLs and distribution connected LIBLs that contribute to an SCI:

- have power system voice and/or data operational communication facilities with networks and AEMO – if they sit within AEMO's operational zone.[25]

[25] This could align with the requirements of generator and BESS under NER 4.3.11. Further, relevant requirements on voice communication are outlined in Section 3.3.1 of the Generator Registration Application Guidelines.

- be subject to instructions and directions issued by networks or AEMO (where they are connected to AEMO's operational zone) under NER 4.8.9 to maintain power system reliability and security. [26]

Benefits

Power system voice and/or data operational communication facilities facilitate direct communication between LIBLs networks and AEMO to best manage management of power system events. LIBLs can materially affect local and system-wide conditions, including frequency, voltage and system strength and to determine an appropriate response to power system events direction communication with LILBs may be necessary. For instance, AEMO may or may not need to enact potentially costly reliability and emergency reserve trader or transitional services contracts depending on hourly data centre demand.

Improved power system reliability and security outcomes are expected from allowing AEMO or networks to direct registered Tier 3 and Tier 2 LIBLs, and all transmission connected LIBLS that have an SCI under NER 4.8.9 will likely facilitate less impactful interventions as a last resort measure to maintain reliability and security. Where data centres are directed, they would be eligible to claim compensation for the costs of complying with a direction. Such directions could be less impactful and costly than equivalent actions to maintain a secure operating state – such as load shedding where electricity supply may be cut off to homes, businesses, education and health care facilities.

4.5. Possible rule amendments

To meet the requirements of a rule change proposal and support stakeholder consultation, AEMO has set out possible approaches through which AEMO's proposed outcomes may be enacted. These proposed approaches are not mutually exclusive. Clear, staged implementation of the preferred rule amendments could be an outcome of the AEMC's process. This could align new regulations with other reforms and allow for progressive refinement of the regulations.

4.5.1. New registration requirement

Registration and market participation categories under the NER facilitate the legal, operational and technical framework through which market participants — such as generators, loads and network service providers — interact with the power system and wholesale market. Registration and market participant categories can grant rights (such as the right to provide electricity market services) and impose obligations (to monitor compliance with performance standards).

[26] Clause 4.8.9 instructions and directions are a last resort measure. Under the NER AEMO can only issue instructions and directions where necessary to maintain or restore the power system to a secure operating state. There are checks and balances on when AEMO may issue directions and instructions under NER 4.8.9.

As it stands, there isn't a specific registration requirement or market participant category for any type of load that does not choose to participate directly in the market providing services – such as frequency control ancillary services. A new load registration category could be developed for LIBLs as a vehicle for applying regulations proposed in this rule change. This would align with the current structure of the NER under which certain regulations are linked to registration.[27]

4.5.2. New access standards

Access standards establish consistent and transparent technical requirements that plant must meet prior to connecting to the NEM. NER Schedule 5.3 access standards could apply nationally consistent monitoring and communication rules. This would align with the Schedule 5.2 access standards (S.5.2.6.1, S.5.2.6.2 and S5.2.5.10) that require generators to have real-time monitoring and communication systems that inform AEMO's market management and operation systems. Access standards are also used to apply ramp-rate limits to generation and BESS (S5.2.5.14 – note this access standard is not directly applicable to LIBLs as it is linked to dispatch instructions).

4.5.3. New NSP obligations

Changes to the NER could require NSPs to impose conditions in connection agreements for the connection of LIBL. Conditions could include reporting certain information as required and/or having monitoring and communications facilities and obligations under NER 4.8.1.

4.5.4. Obligations on large loads

This option would explicitly extend certain NER obligations to the operators of LIBL, even if they are not Market Participants. For instance, "large inverter-based load" is defined in the AEMC's draft access standards package 2 rule to inform aspects of the connection process and could be used in other chapters for regulations.

4.5.5. New guidelines and procedures

New guidelines and procedures can be a practical and flexible avenue to implement new regulatory requirements for LIBL under the NER, particularly where rule changes can't provide sufficient clarity or flexibility. Such instruments can be used to flexibly operationalise high-level rule obligations. New guidelines and procedures may also allow AEMO to address pressing needs while maintaining flexibility to refine requirements as experience is gained and as broader reforms, such as market visibility frameworks or access standards, are developed.

[27] For instance, AEMO may direct/instruct registered participants under NER 4.8.9 and collect information from registered participants under NER 3.13.3A(d).

4.6. Stakeholder engagement

AEMO undertook targeted engagement with networks, data centre proponents, and government stakeholders to help inform the preparation of this rule change. AEMO considers that this consultation was just the beginning of the stakeholder engagement required to inform the identification, design and implementation of new regulations. AEMO looks forward to engaging in the AEMC's process to support the efficient operational integration and visibility of LIBLs in the NEM.

AEMO appreciates the considered engagement and feedback provided through this targeted engagement, including consultation with data centre stakeholders, and has taken that feedback into account in preparing this rule change proposal. AEMO's targeted engagement indicated broad support for clearer and more consistent arrangements for the operational integration and visibility of LIBLs, while also identifying several matters that require further consideration.

4.6.1. Feedback from data centres

Data centre stakeholders generally supported the objective of improving clarity and consistency across connection and operational arrangements, particularly where current requirements vary across NSPs and jurisdictions. However, they emphasised that any new obligations should be proportionate, prospective and practically achievable. Key feedback included that:

- new rules should not apply retrospectively to already connected LIBLs;
- data centre operators may not be able to forecast all demand shifts, particularly where changes are driven by customer computing workloads within colocation facilities; and
- any ramp-rate limits should be carefully justified, designed with industry input and assessed against alternative approaches.

Data centre stakeholders also supported streamlining registration arrangements for back-up generation. They requested greater clarity on the nature, scope and limits of any directions, information requests and operational obligations that may apply.

4.6.2. Feedback from distribution networks

Distribution network feedback highlighted the need for clearer allocation of operational responsibilities between DNSPs, TNSPs and AEMO. They noted that data centre developments are often modular and often delivered in stages. This doesn't align well with the existing regulatory processes for negotiating connection requirements, under which connection applicants may want performance standards to be set in advance of all development even where technical details of future modular developments may not be known.

DNSPs also identified a need for clearer definitions and thresholds, including the interaction between IBL, LIBL and significant cumulative impact concepts, and cautioned that thresholds

should remain meaningful and not automatically require detailed assessments for most connections. DNSPs supported improved monitoring, communications and information sharing, but raised questions about the appropriate level of data granularity, interoperability of systems and whether prescriptive requirements should be mandated before broader DSO arrangements are settled.

Distribution network feedback noted cross transmission-distribution LIBL management can be improved including how network limits are determined where they may have different impacts across transmission and distribution connected LIBLs.

4.6.3. Feedback from transmission networks

Transmission network stakeholders emphasised the need to manage security risks of LIBL connections and for better visibility of LIBL behaviour where it may affect transmission network operation. TNSPs supported clarification of responsibilities and improved information sharing arrangements with DNSPs and AEMO. Transmission networks noted that there isn't a framework for managing large loads across distribution networks like frameworks for generation and bi-directional plant. Transmission networks noted growing concern about fast demand ramping that may have implications for local network stability, frequency control and ancillary service requirements, and potential degradation of network and generation assets.

4.7. Staged implementation and transitional arrangements

AEMO would support a staged implementation of this rule change to facilitate the introduction of new regulations in a manner that is deliverable. A staged approach may allow AEMO and industry to progressively refine regulations as experience is gained, as technologies, and LIBL characteristics evolve. A staged approach could also facilitate alignment with broader reforms such as the Federal Government's AI policy, the Market Visibility Framework, the implementation of any ECMC endorsed data-centre regulations, and CER Roadmap role and responsibility related reforms, thereby reducing the risk of inconsistencies between these reforms.

Transitional arrangements should be applied to both address emerging operational challenges that require management in advance of establishing future state frameworks and avoid the application of new rules to connection processes where connection agreements have been negotiated.

5. How the Proposed Rule Contributes to the National Electricity Objective (NEO)

The proposed rule contributes to the NEO by promoting efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers. It does so by creating a clearer, more consistent and proportionate framework for integrating LIBLs into the NEM, with obligations targeted to the operational and market impacts of those loads. Improved visibility of LIBL demand, operational capabilities and significant short-term demand shifts would support more accurate forecasting, dispatch, reserve assessment, network constraint management and power system operation. This should reduce the need for conservative operating assumptions, inefficient network limitations or emergency interventions, and therefore place downward pressure on associated costs ultimately borne by consumers.

The rule also supports the NEO by improving the reliability, security and safety of electricity supply and the national electricity system as LIBL penetration increases. Monitoring, communication, information provision and, where necessary, demand management obligations would help AEMO and NSPs identify and manage the individual and cumulative impacts of LIBLs before they give rise to insecure operating conditions. At the same time, the rule would preserve flexibility for LIBLs to connect, operate efficiently and provide demand response or other services where they can do so without adversely affecting the system. By facilitating the orderly connection of data centres, hydrogen electrolysers and other emerging large inverter-based loads, the proposed rule can also support efficient electrification and decarbonisation pathways that contribute to participating jurisdiction emissions targets, while ensuring those developments are integrated in a way that is consistent with secure, reliable and affordable electricity supply.

5.1. Expected benefits and costs of the proposed Rule

5.1.1. Benefits

The proposed rule is expected to deliver material benefits for consumers (including LIBLs) by improving AEMO's and NSPs' visibility of large inverter-based loads, enabling more accurate forecasting, dispatch, constraint management and operational decision-making. Consistent monitoring, communication and information provision obligations would support secure and reliable operation of the power system as LIBL demand grows, while reducing the likelihood that system risks are managed by constraining parts of the network, inefficient market interventions or emergency measures. This should support more efficient wholesale market outcomes and address issues that would otherwise place upwards pressure on electricity costs.

The proposed rule would also improve regulatory clarity and investment certainty for LIBL proponents by replacing bespoke and potentially inconsistent arrangements with consistent, proportionate and technology-neutral requirements. A clearer framework should streamline connection and integration processes, support efficient investment in data centres, hydrogen electrolysers and associated infrastructure, and better align operational requirements with the risks that particular LIBLs pose to the market and power system. By applying obligations only where they are necessary and commensurate with power system impacts, the proposed rule would help avoid unnecessary compliance costs while preserving the flexibility for LIBLs to provide demand response and other services that may lower system costs over time.

5.1.2. Costs

The proposed rule is expected to impose some upfront and ongoing costs on some connecting LIBLs, AEMO and NSPs. For new LIBL connections, these costs may include: monitoring, telemetry and operational communication systems (where they aren't already required by networks); developing internal processes to provide short-term demand information; and implementing controls or other operational arrangements to manage rapid changes in demand (where these may negatively impact the networks).

AEMO and NSPs are also likely to incur implementation costs associated with developing procedures, updating systems, assessing LIBL impacts, processing information received from LIBLs and integrating that information into operational, planning and dispatch processes. There may also be transitional costs as industry participants adjust connection processes and negotiate new or amended connection arrangements. AEMO considers that these costs are justified where they avoid more significant costs that would otherwise arise from constraining parts of the network, emergency interventions, inefficient dispatch or unmanaged power system risks as LIBL penetration increases. The proposed staged implementation and proportionate application of obligations should help ensure the overall costs of the rule remain commensurate with the benefits delivered to consumers.