Dear Sir/Madam,

Please find attached the Centre for Smart Power and Energy Research (CSPER), School of Engineering, Deakin University's submission to the Australian Energy Regulator (AER) consultation on Endeavour Energy's Emergency Backstop Mechanism (EBM) Cost Pass-Through Application.

Prepared by Dr Alireza Ganjovi and Associate Professor Saman A. Gorji, this submission provides technical, engineering, and regulatory commentary on Endeavour Energy's proposed recovery of expenditure associated with implementing the NSW Emergency Backstop Mechanism, flexible-export capability, control systems, operational readiness, and Consumer Energy Resources (CER) integration.

The submission does not dispute the need for a technically robust emergency backstop capability to manage minimum-system-load risks, nor does it oppose recovery of prudent, efficient, and genuinely incremental expenditure arising from the new regulatory obligations. Rather, it focuses on strengthening regulatory assurance around the boundary between EBM-specific expenditure and pre-existing or shared DER, flexible-export, dynamic operating envelope (DOE), ADMS, communications, cybersecurity, and digital-network capabilities.

A central argument of the submission is that installed or nominally controllable CER capacity should not be treated as equivalent to operationally available system-security capability. We propose a decision-useful engineering chain linking registered CER, EBM-enabled CER, communication-available CER, controllable CER, successfully commanded CER, verified physical response, and system-security outcome. This provides a transparent basis for assessing how much CER capacity can actually be reached, controlled, and verified when AEMO requires an emergency response.

The submission also highlights the importance of observability, communications performance, and interoperability across the end-to-end control pathway. We recommend a compact set of operational indicators covering EBM-enabled capacity, communications availability, command success, verified response, end-to-end latency, failed-device rates, restoration performance, and interoperability across material OEM and communications pathways. These measures would complement CSIP-AUS conformance requirements by providing visibility of actual fleet-level operational performance.

Consumer impacts are considered alongside technical performance. We recommend that emergency-backstop activations be clearly distinguished from routine DOE and flexible-export interventions, with transparent reporting of activation frequency, curtailed MW and MWh, duration, geographic distribution, repeated customer exposure, and restoration performance. This distinction is important because aggregate curtailed energy alone does not reveal how intervention is distributed across customers, locations, or time.

The submission further recommends proportionate ex-post performance assurance. Specifically, we propose comparing forecast capability, installed capability, available capability, and verified delivered capability, and using common definitions where practicable to benchmark outcomes across Endeavour Energy, Ausgrid, and Essential Energy. The purpose is diagnostic rather than punitive: observed differences should help identify communications, interoperability, OEM, implementation, or control limitations and inform future expenditure assessment and system improvement.

Drawing on our ongoing research and regulatory engagement in DER integration, real-time data and observability, flexible exports, consumer-energy-resource coordination, network performance, and consumer value, we believe the EBM provides an important opportunity to strengthen the link between regulated expenditure and measurable operational outcomes.

The regulatory objective should be to ensure that consumers do not merely fund the installation of emergency-backstop infrastructure, but receive a demonstrably available, interoperable, and operationally effective system-security capability.

We appreciate the opportunity to contribute to this consultation and trust that the submission will assist the Australian Energy Regulator in its assessment of Endeavour Energy's application. We would welcome any further discussion or clarification if required.

Yours sincerely,

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Associate Professor Saman A. Gorji, PhD, SMIEEE, FHEA
Director, Centre for Smart Power and Energy Research (CSPER)
School of Engineering, Deakin University
Victoria, Australia
Email: [redacted]
Phone: [redacted]

Decision-Useful Observability, Verified CER Control, and Consumer Value in Endeavour Energy's Emergency Backstop Mechanism Cost Pass-Through Application

Submission to the Australian Energy Regulator

Endeavour Energy – Emergency Backstop Mechanism Cost Pass-Through Application
Consultation, August 2026

Authors

Dr Alireza Ganjovi
Associate Professor Saman A. Gorji
Centre for Smart Power & Energy Research (CSPER)
School of Engineering, Deakin University

1. Submission Context and Executive Summary

This submission supports a technically robust NSW Emergency Backstop Mechanism (EBM) as a last-resort response to minimum-system-load risk, while focusing on the regulatory assurance attached to Endeavour Energy's proposed cost recovery. Endeavour reports \$35.9 million (real 2024) of incremental expenditure covering Utility Server/flexible-export/control systems, operational readiness and CER Portal integration [1]. The central contribution is an engineering evidence chain: consumers should fund only prudent and efficient incremental capability, and the funded capability should be observable, interoperable, available when required and verifiably effective. Accordingly, the AER should assess both the cost boundary and the conversion of nominal CER capacity into delivered system-security response [2-5].

Core test	Required assurance
Incrementality	Separate EBM-only, accelerated, shared, BAU and previously funded capability.
Operational delivery	Report available and verified MW, not only enrolled or installed MW.
Digital performance	Measure availability, latency, command success, verification and OEM interoperability.
Consumer outcome	Separate EBM from routine flexible exports and report curtailment distribution.
Ex-post assurance	Compare forecast, installed, available and verified capability across NSW DNSPs.

2. Scope and Regulatory Context

Endeavour seeks AER approval to recover costs created by NSW licence changes requiring remote curtailment of eligible DPV during AEMO-directed MSL events, flexible-export capability, modified connection processes and integration with the NSW CER Installer Portal [1, 3]. The application allocates about \$19.5 million to Utility Server, Flexible Exports and Control Systems, \$8.9 million to Operational Readiness and Industry Support, and \$7.6 million to connection/CER Portal integration [1].

This submission does not dispute the need for emergency backstop capability. It asks whether claimed costs are genuinely incremental, prudent and efficient, operationally effective and measurable after implementation. The AER's Powercor VEBM precedent tested whether costs arose from the new obligation, were additional to BAU and existing allowances, and reflected efficient scope and cost [5]. International frameworks similarly link digital-network expenditure to defined outputs or measurable performance [6, 7]. Figure 1 summarises the regulatory assurance chain adopted in this submission, linking the EBM obligation and incremental expenditure to implemented capability, operational availability, verified response, system-security outcomes and consumer impacts.

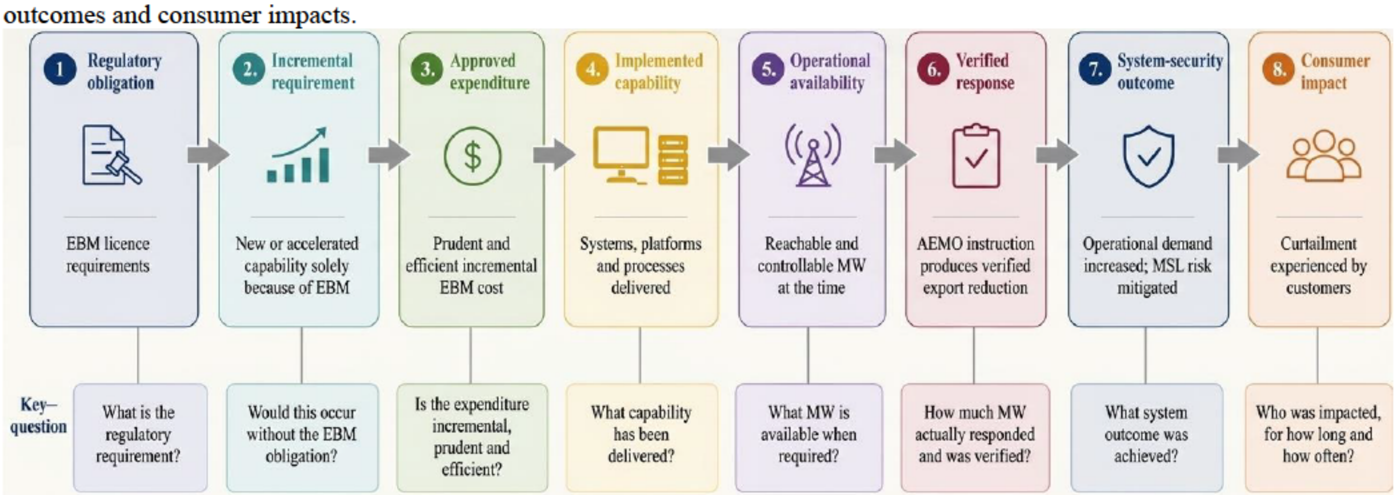

Figure 1. Regulatory assurance chain for Emergency Backstop Mechanism capability.

3. Incremental Cost and Shared Capability

Endeavour's architecture is multi-purpose. The Utility Server, DOE engine, ADMS interfaces, communications, cybersecurity and CER Portal integration can support both emergency curtailment and routine active-DER functions [1]. Endeavour also states that the program accelerates its transition to dynamic grid management and builds on an earlier flexible-export trial [1]. The AER should therefore establish a credible no-EBM counterfactual rather than assuming a zero-cost baseline.

$$C_{EBM}^{eligible} = C_{new,EBM} + C_{acceleration} + \alpha C_{shared} - C_{BAU} - C_{existing\ allowance} - C_{avoided/saved} \quad (1)$$

Here, eligible EBM cost is the sum of EBM-only expenditure, demonstrable acceleration cost and an attributable share of common assets, less BAU, existing allowances and identifiable avoided or saved expenditure. Shared functionality is not automatically ineligible; it requires causal allocation. DOE and DERMS literature confirms that the same digital infrastructure can support hosting-capacity management, flexible exports, DER coordination and security functions [8, 9].

Cost type	Engineering test	Suggested treatment
EBM-only	Required solely for AEMO-directed EBM	Eligible if prudent and efficient
Accelerated existing capability	Already planned but materially brought forward	Recover demonstrable acceleration increment
Shared EBM/flexible-export capability	Common asset serves emergency and routine functions	Allocate on transparent causal/functional basis

BAU or pre-existing	Required irrespective of EBM	Exclude
Previously funded or duplicate	Covered by existing allowance/program or another recovery route	Exclude to the extent already funded

AER review should reconcile material work packages against existing ADMS/DERMS allowances, flexible-export and DOE trials, CER/connection-platform expenditure, cybersecurity and telecommunications programs, BAU ICT replacement, external co-funding and other regulatory recovery mechanisms [1, 5].

4. From Installed Capability to Verified Response

Nominal enrolment does not equate to operational response. AEMO reports initial installation compliance of approximately 30-50%, improving to 70-80%, while at-scale internet-based activations have achieved responses from only 70-85% of correctly installed and commissioned sites [3]. Consequently, AEMO estimates that approximately 50-68% of devices required to provide backstop capability may respond during an at-scale activation [3]. South Australian experience also identifies substantial OEM response delays in some cases [10]. Figure 2 illustrates how successive losses across commissioning, communications, controllability and command execution can reduce nominal CER capacity to the response ultimately available for system-security purposes.

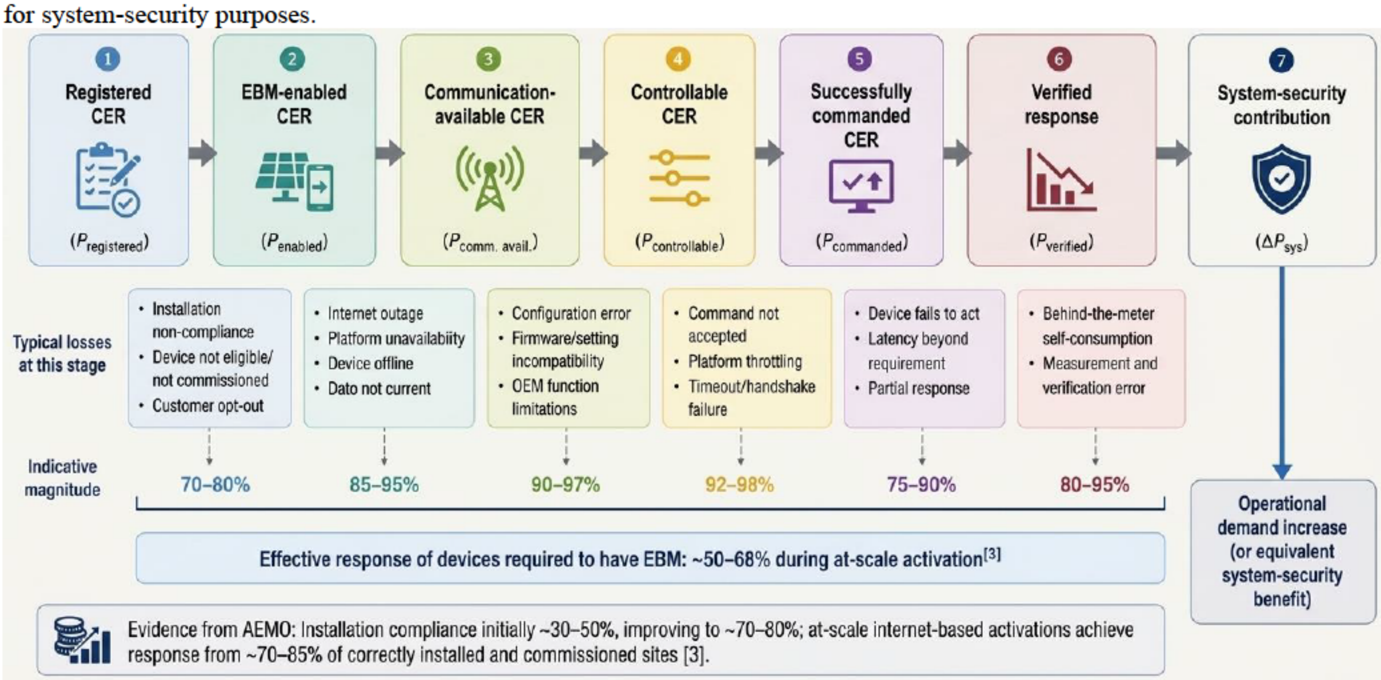

Figure 2. Conversion of Nominal CER Capacity into Verified EBM Response

The AER should require the sequential reconciliation: Registered CER → EBM-enabled CER → communication-available CER → controllable CER → successfully commanded CER → verified response → system-security outcome. Each transition can reduce usable capability.

$$\eta_{EBM} = \frac{P_{verified}}{P_{registered}} \tag{2}$$

The relevant physical response is not a command acknowledgement but verified export/generation reduction within the required interval. Response time must therefore be reported with MW. AEMO has identified an initial objective of effective response within about 60 minutes, with improvement toward approximately 15 minutes from DNSP signal to confirmation [3]. Further, curtailed inverter MW is not automatically equal to system-security MW because behind-the-meter self-consumption can continue during zero-export operation [3].

$$\Delta P_{sys} = P_{operational\ demand,post} - P_{counterfactual\ operational\ demand} \tag{3}$$

5. Observability, Communications and Interoperability

The EBM is a distributed cyber-physical control system. CSIP-AUS provides a common communications foundation, but protocol conformance does not guarantee fleet-level availability, end-to-end latency or physical response [11]. International active-system-management frameworks similarly treat observability, controllability, data exchange and delivery verification as separate operational requirements [12, 13]. The AER should therefore require a small set of outcome-oriented KPIs calculated on both device-count and MW-capacity bases.

KPI	Why it matters
EBM-enabled MW	Nominal commissioned fleet
Communication availability	Reachable capacity immediately before activation

Command success rate	Control-path effectiveness
Response verification rate	Physical delivery
End-to-end latency	Timeliness from instruction to verified response
Failed-device rate	Reliability and failure diagnosis
Restoration success	Return to authorised operating state
OEM interoperability	Fleet-wide usability across material platforms

Interoperability should be demonstrated across major OEM/gateway pathways through end-to-end and at-scale tests, not inferred solely from laboratory certification. Telemetry should be fit for purpose: sufficient to estimate availability, diagnose failures, verify aggregate response and reconstruct material events without imposing unnecessary high-frequency metering on every household DER [12, 13].

6. Consumer Impact and Performance-Based Assurance

EBM operation should remain distinguishable from routine DOE/flexible-export intervention. For each actual activation, Endeavour should retain the initiating AEMO instruction, requested and available MW, verified MW, curtailed MWh, event duration, affected customers, geographic distribution, repeated-customer exposure and restoration performance. Separate event codes should identify EBM activation, routine flexible-export/DOE action, communications fallback and testing.

Aggregate curtailed MWh alone is insufficient. Australian research shows that PV curtailment can vary materially by customer and location, while DER-control schemes can produce different distributions of curtailment even when aggregate technical objectives are met [14, 15]. The AER should therefore monitor median and tail exposure, such as P90/P95 curtailed energy, curtailed hours and activation frequency, at an appropriately aggregated network geography. This is a transparency requirement, not a proposal to optimise equity during an emergency.

Cost approval should be followed by proportionate ex-post verification. Figure 3 summarises the proposed assurance framework, linking forecast capability to installed, available and verified capability, system-security outcomes and consumer impacts, with feedback into future expenditure assessment and cross-DNSP benchmarking. The purpose is diagnostic rather than automatic clawback: material differences should be traced to installation, communications, interoperability, OEM, control or external factors.

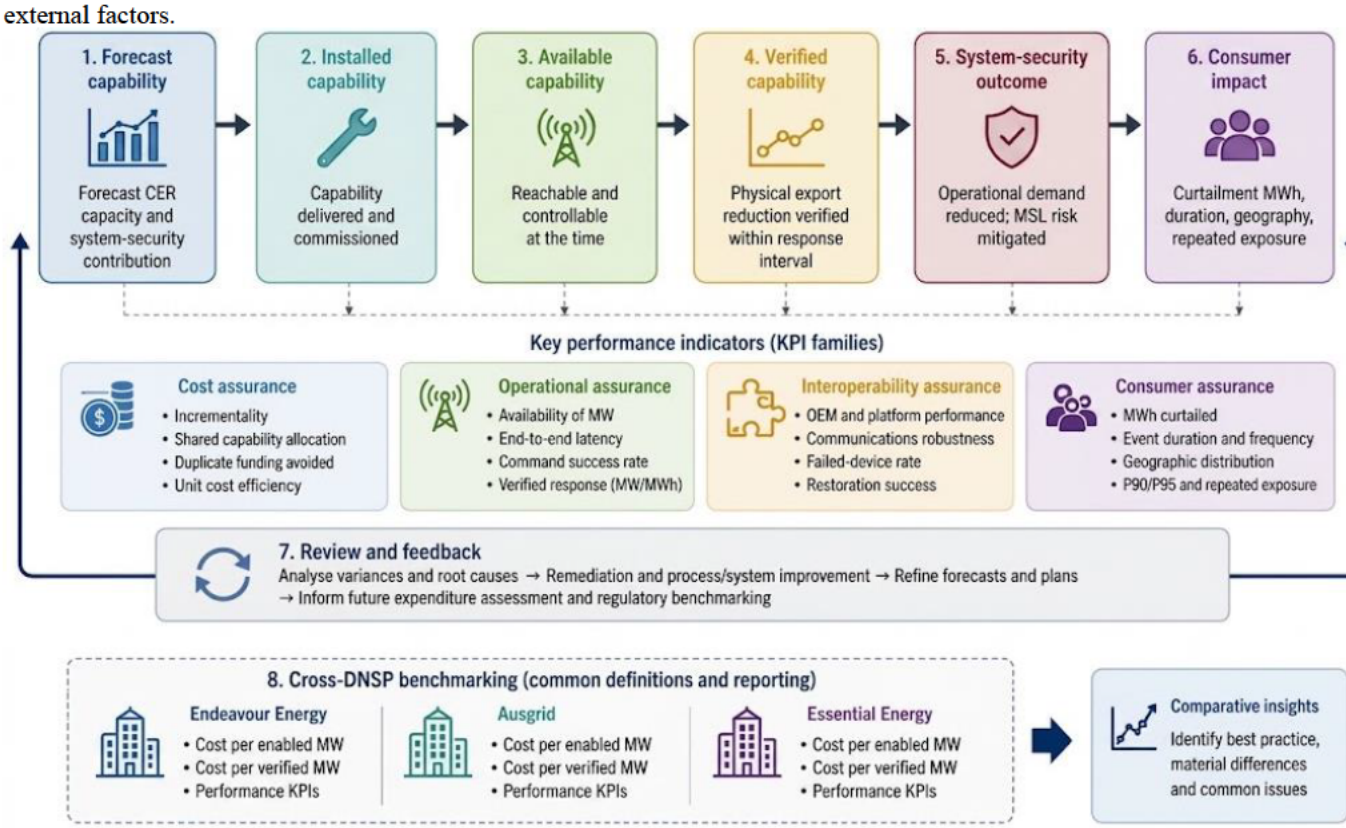

Figure 3. Ex-Post Performance Assurance and Cross-DNSP Benchmarking Framework

7. Recommendations and Conclusion

i. Apply a clear incrementality test. Separate EBM-only expenditure from accelerated, shared, BAU, previously funded and duplicate capability [5].

ii. Require verified operational capability. Report reachable, controllable and verified MW within required response intervals, not only enrolled or installed MW [3].

iii. Establish minimum communications and interoperability KPIs. Include availability, end-to-end latency, command success, verified response, failed-device rate, restoration and major-OEM performance [11-13].

iv. Separate emergency backstop from routine flexible exports. Maintain distinct event records so security interventions, customer impacts and use of shared assets remain auditable.

v. Require transparent consumer-curtailment reporting. Report frequency, duration, MW/MWh, geographic concentration, repeated exposure and restoration [14, 15].

vi. Conduct ex-post performance review and NSW DNSP benchmarking. Compare forecast, installed, available and verified capability using common definitions across Endeavour Energy, Ausgrid and Essential Energy where practicable [2, 7].

The regulatory objective should be to ensure that consumers do not merely fund the installation of emergency-backstop infrastructure, but receive a demonstrably available, interoperable and operationally effective system-security capability.

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