Enhancing Network-Resilience Observability, Community-Risk Visibility, and Adaptive Governance in the AER Network Resilience Guidelines

Submission to the Australian Energy Regulator

Network Resilience Guidelines, Consultation Paper, June 2026

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Submission Context

This submission responds to the Australian Energy Regulator's consultation paper on the development of Network Resilience Guidelines. It is prepared within the Centre for Smart Power & Energy Research (CSPER)'s broader research program on inverter-dominated power systems, distribution and transmission planning, consumer energy resources, resilience metrics, regulatory observability, and adaptive governance. We support the AER's objective of improving clarity, transparency, and consistency in the assessment of network resilience expenditure. The submission does not oppose prudent and efficient resilience investment. Rather, it focuses on how resilience proposals can be made more observable, evidence-based, consumer-focused, and adaptive as electricity networks face increasing exposure to severe weather events, climate uncertainty, electrification, distributed energy resources, and changing community expectations. In particular, the submission examines opportunities to strengthen the definition of resilience, improve evidence requirements for resilience expenditure, enhance community-resilience visibility, align DAPR reporting with Annual Information Orders, clarify the treatment of resilience in incentive schemes, and extend whole-of-system resilience principles across both distribution and transmission networks.

Executive Summary

We support the AER's development of Network Resilience Guidelines and recognise the need for clearer regulatory treatment of expenditure intended to reduce the impact of severe weather events on electricity networks and consumers. As bushfires, floods, storms, heatwaves, and compound climate-related events become increasingly material to network planning and operation, resilience should be treated as a core regulatory issue rather than an exceptional or secondary consideration.

This submission supports the AER's proposed focus on identified need, option testing, and genuine consumer engagement. However, we recommend that the guidelines also embed a practical resilience-observability framework. Resilience expenditure should not be assessed only through forecast expenditure, asset categories, or broad claims of risk reduction. It should be supported by transparent indicators that identify the relevant hazards, exposed assets, affected customers and communities, credible alternatives, expected benefits, delivered outcomes, and review triggers over time. The recommendations are summarised in Table 1.

Table 1. Summary of Recommendations

Recommendation	Theme	Recommendation Summary
Recommendation 1	Definition of resilience	Define network resilience as a measurable capability to anticipate, withstand, operate through, restore from, and adapt after severe weather events, while distinguishing it from ordinary reliability.
Recommendation 2	Whole-of-system scope	Apply the core principles of the guidelines directly to DNSPs and, where relevant, as principles-based guidance for TNSPs where severe-weather risks create material consumer impacts.
Recommendation 3	Resilience evidence template	Introduce a standardised resilience-expenditure evidence template linking climate risk, asset exposure, affected customers, options analysis, consumer engagement, expected outcomes, and post-implementation reporting.
Recommendation 4	Public resilience data	Strengthen DAPR and Annual Information Order reporting to improve visibility of resilience expenditure, outage exposure, restoration performance, severe-weather impacts, post-event learning, and delivered outcomes.
Recommendation 5	Community resilience	Clarify the DNSP role in supporting community resilience and require evidence of coordination with emergency services, local government, critical infrastructure operators, community organisations, and affected customers.
Recommendation 6	Adaptive governance and incentive alignment	Introduce adaptive review triggers and clarify interactions with STPIS, CESS, and EBSS to avoid double counting, distinguish genuine efficiency from non-delivery, and support long-term consumer value.

Central Proposition: Resilience expenditure should be assessed not only by whether it appears prudent at the time of approval, but by whether its assumptions, risks, alternatives, benefits, delivery, and outcomes remain visible, testable, and reviewable over time.

1. Introduction and Scope

This submission responds to the Australian Energy Regulator's Network Resilience Guidelines Consultation Paper, published in June 2026. The paper is the first stage of the AER's process to develop non-binding guidelines for assessing network resilience expenditure under the National Electricity Rules (NER) [1]. It follows the AEMC's 2025 rule change, which introduced distribution network resilience expenditure factors into the NER and requires the AER to publish Network Resilience Guidelines by 1 December 2026 [2].

The consultation is timely. Severe storms, bushfires, floods, heatwaves, and compound events are becoming material to network planning, asset management, emergency response, and consumer outcomes. Australian climate reporting identifies increases in extreme heat, fire-weather conditions, heavy-rainfall intensity, and coastal hazards [3]. International evidence also shows that climate-driven events are a growing source of grid disruption, requiring asset hardening, operational preparedness, restoration capability, risk modelling, and adaptive planning [4-7].

The AER consultation focuses on five issues: the definition of network resilience; evidence requirements for resilience expenditure; the relationship between network and community resilience; new resilience reporting in Distribution Annual Planning Reports (DAPRs); and the treatment of resilience expenditure under incentive schemes [1]. These issues should be treated together. A credible resilience framework requires measurable definitions, transparent evidence, post-event performance visibility, and recognition of the operational links between network and community impacts during prolonged outages [8-10].

This submission focuses on six areas:

- defining network resilience in measurable terms and distinguishing it from ordinary reliability;
- applying whole-of-system resilience principles across distribution and transmission where severe-weather risks create material consumer impacts;
- improving evidence for resilience expenditure, including climate-risk modelling, asset exposure, customer impact, restoration capability, and option testing;
- strengthening DAPR and Annual Information Order reporting through transparent indicators;
- clarifying the DNSP role in community resilience, particularly for emergency response, critical services, vulnerable customers, and temporary supply restoration;

- introducing adaptive review triggers and incentive-scheme safeguards so approved resilience expenditure remains efficient, observable, and aligned with consumer outcomes.

The aim is not to add reporting burden. It is to ensure that customer-funded resilience expenditure is evidence-based, tested against credible alternatives, linked to measurable risk reduction, and reviewable as climate risks, network conditions, consumer needs, and technologies evolve. Resilience should be treated as an observable capability to anticipate, withstand, operate through, recover from, and adapt after severe-weather disruption, not as a generic expenditure category [5-8].

2. CSPER's Relevant Background

The Centre for Smart Power & Energy Research (CSPER), School of Engineering, Deakin University, conducts research on electricity-network planning, inverter-dominated systems, distributed and consumer energy resources, electrification, digital-twin modelling, regulatory observability, resilience metrics, and adaptive governance.

CSPER's recent work has focused on how planning and regulatory frameworks can remain transparent and robust under uncertainty. This includes work on transmission and distribution planning, system-strength observability, real-time data visibility, consumer-energy-resource integration, and lifecycle reporting of energy infrastructure investments.

This submission applies those principles to the AER's Network Resilience Guidelines, with particular emphasis on evidence quality, reporting transparency, consumer-risk visibility, and adaptive governance.

3. Overall Position

We support the AER's development of Network Resilience Guidelines. We also support the AER's proposed assessment focus on identified need, testing of preferred options, and genuine consumer engagement.

However, resilience is not a static asset category. It is a performance capability under uncertain and changing conditions. For this reason, resilience proposals should be assessed using observable indicators that connect climate risk, network vulnerability, community exposure, investment options, consumer outcomes, and post-event performance.

Key Principle: Resilience regulation should make visible not only what networks propose to spend, but what risks are being reduced, which communities benefit, what alternatives were considered, and whether expected outcomes are realised.

Figure 1 illustrates the conceptual framework underpinning this submission. It shows how severe-weather hazards translate into asset exposure, customer and community impacts, resilience investment options, expenditure decisions, and delivered outcomes, with post-event review and adaptive triggers providing a feedback mechanism for continuous improvement. The framework emphasises that network resilience should be treated as an observable capability with measurable outcomes throughout the investment lifecycle, rather than as a broad expenditure category.

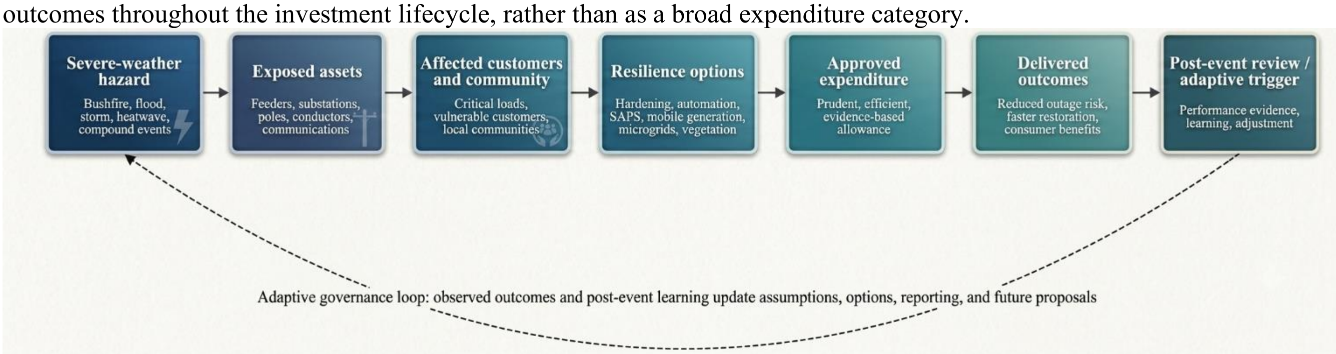

Figure 1. Resilience Observability Framework.

4. Recommendation 1: Strengthen the Definition of Network Resilience

We recommend that the AER define network resilience as the capability of a network and its supporting systems to anticipate, withstand, operate through, restore from, and adapt after severe weather events that could cause prolonged outages or material consumer harm.

This definition should separate resilience from ordinary reliability. Reliability concerns expected service performance under routine operating conditions. Resilience concerns performance during disruptive, extreme, uncertain, or climate-amplified events, where the relevant question is how severe the interruption is, how long it lasts, who is affected, and how effectively supply is restored [1, 2, 11, 12]. This distinction matters because standard reliability indicators may exclude or under-represent major event days, while resilience expenditure is directed at reducing the extent, duration, severity, and consumer impact of major disruptions [6, 9, 13].

The proposed definition is consistent with established resilience frameworks. CIGRE defines power-system resilience in terms of limiting the extent, severity, and duration of degradation after an extreme event [11]. IEEE-related and peer-reviewed literature similarly treats resilience as a dynamic capability across preparation, absorption, response, restoration, and adaptation, rather than as a static asset attribute [5, 6, 8, 12, 14].

The guidelines should classify expenditure as resilience expenditure only where the primary driver is to reduce the probability, duration, severity, restoration burden, or consumer impact of outages caused by severe weather events. This would avoid relabelling ordinary replacement, routine reliability, safety compliance, or generic asset-hardening expenditure as resilience expenditure. It would also improve consistency across regulatory proposals, DAPR reporting, Annual Information Orders, Value of Network Resilience assessments, and post-event reviews [1-3].

To make resilience observable, the definition should be supported by measurable indicators, including:

- exposure to bushfire, flood, windstorm, heatwave, lightning, and compound-event risk;
- customers exposed to prolonged outage risk;
- critical loads exposed, including hospitals, water systems, telecommunications, emergency services, and community refuges;
- vulnerable customers and communities exposed to extended interruption;
- expected outage duration and restoration time under severe-weather scenarios;
- historical severe-weather outage frequency, duration, location, and restoration sequence;
- avoided customer minutes interrupted during major events or prolonged outages;
- ability to provide temporary, partial, or staged supply during restoration;
- performance of mobile generation, SAPS, sectionalisation, automation, communications, and emergency-response assets;
- post-event learning, corrective actions, and updates to asset-management or emergency-response practices.

These indicators would link resilience expenditure to observable risk reduction and consumer outcomes. They would also help distinguish severe-weather resilience from routine reliability, safety compliance, asset replacement, and broader community-support functions.

Key Principle: Resilience should be treated as an observable network capability to reduce the extent, duration, severity, and consumer impact of severe-weather disruption, not as a vague label for weather-related spending.

5. Recommendation 2: Apply Whole-of-System Resilience Principles to Transmission and Distribution

Although the AEMC rule change focuses on distribution network resilience, the AER should apply the core principles of the Network Resilience Guidelines to transmission networks where severe-weather risks, resilience expenditure, or consumer impacts are material. The guidelines should apply directly to Distribution Network Service Providers (DNSPs), consistent with the rule change, while also providing principles-based guidance for Transmission Network Service Providers (TNSPs).

This approach recognises that severe-weather impacts propagate across the electricity supply chain. Transmission failures can disconnect generation, reduce interconnector capability, constrain restoration, trigger load shedding, and amplify downstream outage impacts. The February 2024 Victorian storm event illustrates these interdependencies. Six 500 kV transmission towers collapsed, the Moorabool-Sydenham 500 kV line failed, Loy Yang A units disconnected, and AEMO directed load shedding, leaving more than one million customers without supply and over 531000 customers off supply at the peak [15, 16]. The event demonstrates that resilience cannot be assessed solely at the distribution boundary when upstream failures create widespread consumer and community impacts.

International literature similarly treats resilience as a multi-layer capability involving generation, transmission, distribution, control systems, communications, restoration resources, and institutional response [5, 6, 8, 13]. The IEA emphasises coordinated transmission and distribution planning as climate risks, electrification, renewable integration, and system interdependence increase [7]. Resilience assessment should therefore consider cascading impacts, restoration dependencies, critical-load exposure, interconnection constraints, and cross-network recovery capability.

The guidelines should recognise two levels of application:

- primary application to DNSPs, consistent with the AEMC rule change;
- principles-based application to TNSPs where severe-weather exposure, resilience expenditure, restoration capability, or consumer impacts are material.

For TNSPs, guidance should focus on transmission-specific risks, including exposure of high-voltage corridors to bushfire, flood, storm, heat, lightning, and compound events; critical lines and substations with high downstream load exposure; interconnector vulnerability; generation-disconnection risk; restoration dependencies; network redundancy and reconfiguration capability; emergency communications; and post-event learning.

Applying common resilience principles would improve consistency and comparability without extending the legal scope of the rule change. It would also support assessment of shared risks where transmission and distribution resilience are operationally interdependent, including regional restoration, supply to critical infrastructure, black-start pathways, telecommunications resilience, emergency generation deployment, and coordination with emergency-management agencies.

TNSPs can already seek approval for resilience expenditure under the existing regulatory framework, but the absence of consistent guidance may lead to uneven evidence and reporting across network businesses [1, 2, 17]. The AER should therefore state that the Network Resilience Guidelines apply directly to DNSPs and may also provide relevant guidance for

TNSPs. This would support a consistent treatment of climate risk, severe-weather exposure, restoration capability, and consumer impacts while respecting the distribution-specific basis of the rule change.
Key Principle: Resilience should be assessed across the electricity supply chain where severe-weather risks create material consumer impacts.

6. Recommendation 3: Introduce a Standardised Resilience-Expenditure Evidence Template

We support the AER's proposal for a standardised resilience-expenditure template. A common framework would improve consistency, reduce ambiguity, and enable comparison across network businesses, regions, asset classes, and hazards. This is particularly important because resilience expenditure depends on uncertain factors including climate projections, hazard exposure, asset vulnerability, restoration capability, customer location, and the value consumers place on avoiding prolonged outages [1-3, 9].

Each proposal should demonstrate a clear link between the hazard, exposed assets, affected customers, the proposed option, expected risk reduction, and consumer outcomes. Without such a structure, resilience expenditure risks becoming a broad spending category rather than an evidence-based response to severe-weather risk. A standardised template would also improve transparency around assumptions, data sources, option testing, and benefit estimates, thereby supporting the AER's assessment of prudency and efficiency [1, 2, 18].

The template should include:

- identified severe-weather hazards, including bushfire, flood, storm, wind, heatwave, lightning, and compound-event exposure;
- climate assumptions, scenarios, data sources, and spatial resolution;
- exposed assets and locations, including feeders, substations, poles, conductors, communications systems, access routes, and restoration assets;
- affected customers and communities, including critical loads, vulnerable customers, regional communities, and areas exposed to prolonged outages;
- historical outage and restoration evidence;
- orecast risk without investment, including outage duration, restoration burden, safety impacts, and consumer harm;
- options considered, including network hardening, automation, vegetation management, undergrounding, covered conductors, mobile generation, SAPS, batteries, demand response, microgrids, and emergency-response measures;
- cost-benefit assessment, uncertainty treatment, sensitivity analysis, and avoided outage impacts;
- Value of Network Resilience assumptions, particularly for outages exceeding 12 hours;
- consumer engagement evidence, including consultation on options, trade-offs, costs, and bill impacts;
- expected reliability, safety, restoration, emergency-response, and community outcomes;
- proposed reporting and review indicators for DAPRs, Annual Information Orders, and post-event assessment.

This structure is consistent with resilience-assessment literature, which emphasises hazard identification, vulnerability assessment, consequence analysis, restoration modelling, option comparison, and performance metrics [5, 8, 12, 19]. It is also aligned with infrastructure-adaptation guidance linking climate hazards, asset exposure, service disruption, consequences, adaptation measures, and monitoring arrangements [20, 21].

The framework should remain proportionate. Its purpose is not to reward document volume, but to make resilience proposals testable: what risk exists, who is exposed, which option reduces that risk, at what cost, compared with what alternatives, and how outcomes will be evaluated after approval.
Key Principle: Resilience proposals should be supported by standardised evidence linking hazards, network impacts, customer exposure, options, costs, and expected outcomes.

7. Recommendation 4: Strengthen DAPR and Annual Information Order Reporting

We recommend that the Network Resilience Guidelines establish concise and standardised reporting requirements for Distribution Annual Planning Reports (DAPRs), aligned where possible with the AER's Annual Information Orders. DAPRs should provide public visibility of resilience risks, actions, and outcomes, while Annual Information Orders should provide the detailed and auditable data needed for regulatory assessment.

These instruments serve different purposes. DAPRs communicate network risks and planning priorities, whereas Annual Information Orders support expenditure assessment, benchmarking, and performance monitoring. The two should therefore operate in a complementary manner: DAPRs should explain resilience risks and outcomes, while Annual Information Orders should provide structured evidence on expenditure, performance, and asset exposure.

The AEMC's resilience rule requires DNSPs to include resilience information in DAPRs from 2028, including severe-weather risks, resilience activities, expenditure, and performance outcomes [2]. The AER consultation paper similarly identifies DAPR reporting as a key mechanism for improving transparency and accountability [1]. This approach is consistent with broader infrastructure-resilience guidance emphasising disclosure of climate risks, asset exposure, adaptation measures, and performance monitoring [20-22].

Useful DAPR indicators should include:

- severe-weather risks by region, feeder, asset class, or hazard;
- historical major-event outage performance;
- restoration times, including partial and full restoration;
- customers exposed to prolonged outages;
- exposure of critical infrastructure and vulnerable communities;
- resilience expenditure by program, asset type, location, and hazard driver;
- progress against approved resilience programs;
- post-event review findings;
- performance of resilience measures, including mobile generation, SAPS, automation, undergrounding, covered conductors, pole-top hardening, vegetation management, sectionalisation, and emergency-response assets;
- lessons learned and changes to planning assumptions.

These indicators would link expenditure to observable outcomes and enable comparison between forecast and realised performance. Resilience reporting should therefore focus on exposure, consequences, mitigation measures, restoration capability, and adaptation outcomes rather than expenditure alone.

Annual Information Orders should collect more granular information, including asset-level exposure, feeder-level outage records, restoration sequences, major-event classifications, program expenditure, unit costs, avoided-risk estimates, resilience-benefit assumptions, and post-event performance. This would improve the AER's ability to assess prudency, efficiency, and consumer value while reducing reliance on ad hoc information requests during revenue determinations.

The framework should also distinguish resilience from routine reliability. Conventional metrics such as SAIDI, SAIFI, and CAIDI remain useful but do not fully capture prolonged outages, restoration performance, or community exposure [12, 23, 24]. Additional event-based metrics should therefore include customers exposed to outages exceeding 12 hours, time to first restoration, time to full restoration, critical-load restoration priorities, and customer minutes interrupted during major events. These measures align more closely with resilience concepts and the AER's Value of Network Resilience framework [5, 9, 25].

Reporting requirements should remain proportionate. Highly granular or security-sensitive information need not be published. However, DAPRs should provide sufficient information for consumers, local governments, emergency-management agencies, and other stakeholders to understand where material resilience risks exist, what actions are proposed, and whether outcomes are improving.

Figure 2 illustrates the reporting and governance architecture proposed in this submission. It shows how resilience risks across distribution and transmission networks flow through complementary reporting layers, with DAPRs providing public visibility and Annual Information Orders supplying detailed regulatory evidence. The framework highlights how transparent reporting supports incentive-scheme safeguards and adaptive review, thereby strengthening accountability and ensuring that resilience expenditure remains observable throughout the investment lifecycle.

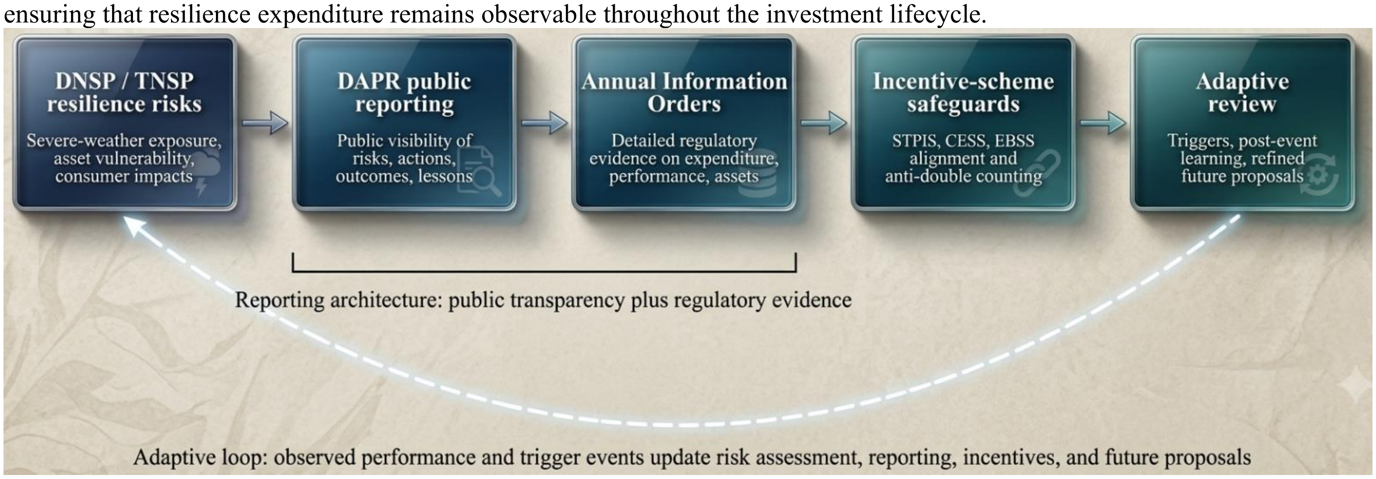

Figure 2. Whole-of-System Resilience and Reporting Architecture.

Key Principle: DAPRs should provide public resilience visibility, while Annual Information Orders should provide deeper regulatory evidence.

8. Recommendation 5: Clarify the Role of DNSPs in Supporting Community Resilience

We support the AER's distinction between network resilience and community resilience. Network resilience concerns the ability of electricity networks and supporting systems to withstand, operate through, and recover from severe-weather disruption. Community resilience is broader, encompassing the capacity of households, businesses, local governments, emergency services, critical infrastructure operators, health services, and community organisations to prepare for, respond to, and recover from disasters [1, 2, 26, 27].

DNSPs play an important role in community resilience, but they are not solely responsible for disaster preparedness and recovery. Prolonged outages affect health, communications, water supply, transport, food security, emergency response, business continuity, and social wellbeing, with disproportionate impacts on vulnerable and remote communities [13, 27-30]. DNSP resilience activities should therefore be assessed according to their contribution to network-service provision, restoration, safety, outage communication, temporary supply, and coordination with emergency-management systems.

The guidelines should clarify that DNSP-funded community resilience measures are appropriate where they are directly linked to distribution-service outcomes. Relevant measures include mobile generation, temporary supply connection points, emergency-response vehicles, improved outage communication systems, coordination with local councils and emergency services, support for critical facilities, and targeted planning for vulnerable customers and high-risk communities [1, 15, 18, 31, 32].

Clear boundaries are important. Broad disaster-management functions should not be transferred to electricity consumers where they are more appropriately undertaken by governments, emergency agencies, telecommunications providers, or community organisations. At the same time, network-connected measures should not be excluded merely because they deliver social or emergency-response benefits. The relevant test should be whether the expenditure is prudent, efficient, evidence-based, and clearly connected to distribution-service outcomes.

Before proposing community-resilience expenditure, DNSPs should demonstrate coordination with local governments, emergency services, critical infrastructure operators, community organisations, vulnerable-customer representatives, and affected communities. Proposals should also show that measures address identified outage risks, critical-load exposure, vulnerable-customer needs, and restoration constraints.

Assessment should consider whether the proposed measure improves:

- safe operation during severe-weather events;
- restoration speed;
- temporary or partial supply to critical facilities;
- outage communication and situational awareness;
- protection of vulnerable customers;
- coordination with emergency services and councils;
- prioritisation of restoration resources;
- post-event preparedness and learning.

Community-resilience measures should also be tested against alternatives. Mobile generation, SAPS, community batteries, microgrids, backup supply points, and customer-support programs may offer different benefits depending on hazard type, outage duration, load criticality, and community characteristics [15, 18, 32, 33]. DNSPs should therefore explain why the preferred option is superior to government-funded, council-led, customer-side, or other non-network alternatives.

Where community-resilience measures are deployed during major events, post-event reviews should assess operational performance, beneficiaries, communication effectiveness, support for vulnerable customers, and restoration outcomes. This would transform community resilience from a broad policy objective into an observable network-service function.

Key Principle: Community resilience expenditure should be accepted where the DNSP role is clear, coordinated, evidence-based, and connected to network service outcomes.

9. Recommendation 6: Introduce Adaptive Governance and Incentive-Scheme Safeguards

Resilience expenditure is characterised by deep uncertainty. Climate hazards, asset vulnerabilities, customer exposure, critical-load requirements, electrification, DER uptake, emergency-response capability, and severe-weather patterns may change materially over an asset's life. A framework based solely on ex-ante approval is therefore incomplete. The guidelines should incorporate adaptive review mechanisms so that assumptions, expenditure, and outcomes can be tested against observed conditions.

Adaptive governance combines investment certainty with monitoring and learning. Dynamic adaptive policy pathways literature recommends identifying trigger points and maintaining flexibility where future conditions diverge from expectations [34, 35]. Climate-adaptation frameworks similarly emphasise monitoring, no-regret measures, and reduced lock-in under uncertainty [36]. These principles are directly relevant to resilience expenditure because severe-weather risks are non-stationary and historical outage patterns may not adequately represent future exposure [5, 20, 22].

Figure 3 illustrates the adaptive governance approach proposed in this submission. Rather than treating resilience expenditure as a one-off approval decision, the framework links implementation and observed outcomes to review triggers that inform future proposals. It also highlights the need for clear interactions with STPIS, CESS, and EBSS so that resilience investments remain efficient, observable, and protected against double counting throughout the investment lifecycle.

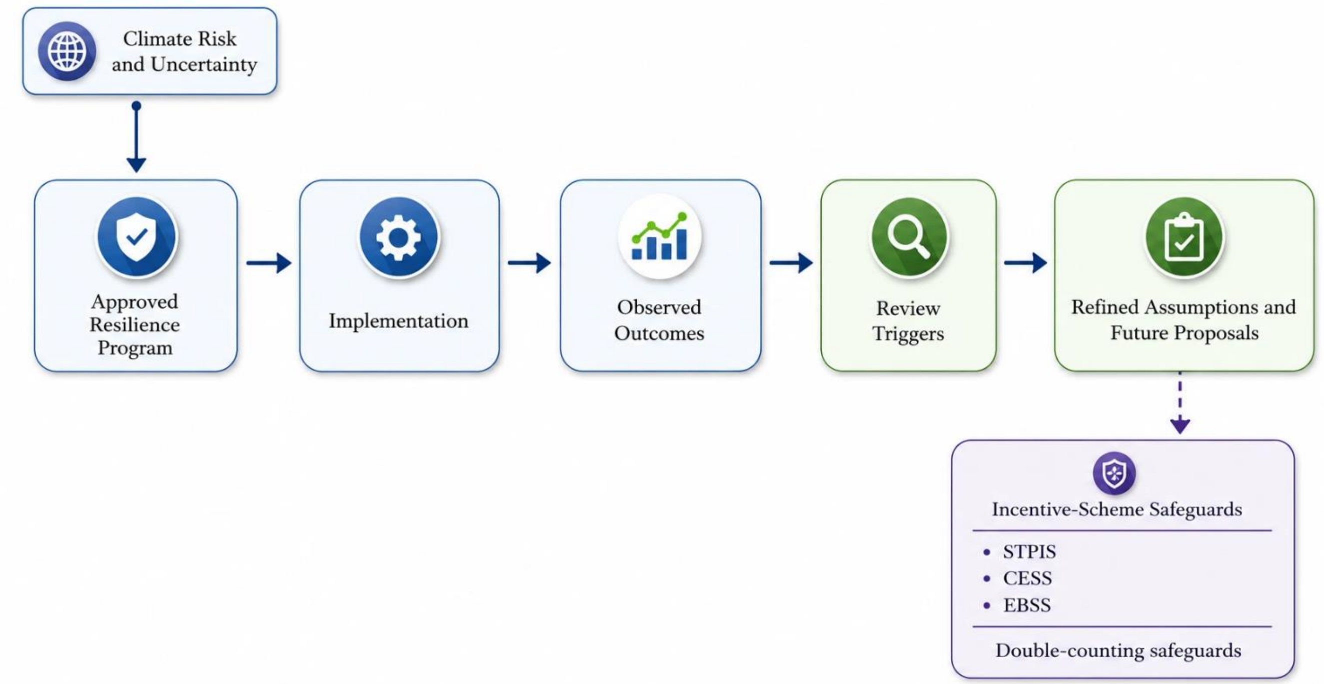

Figure 3. Adaptive Governance and Incentive Framework.

DNSPs should identify review triggers for material resilience programs. Suggested triggers include:

- material changes in severe-weather risk exposure;
- major post-event performance failures;
- repeated outages in priority resilience areas;
- material under-delivery of approved programs;
- significant divergence between forecast and actual expenditure;
- evidence that alternative options, including SAPS, mobile generation, microgrids, automation, batteries, demand response, or targeted vegetation management, are more efficient;
- changes in community exposure, vulnerable-customer concentration, or critical-load requirements;
- • material changes in electrification, DER uptake, or flexible-demand capability affecting network risk or restoration options.

These triggers should be diagnostic rather than automatic reopening mechanisms. Their purpose is to identify circumstances where updated analysis, reporting, or program refinement may be justified [22, 34-36].

The AER should also clarify interactions between resilience expenditure and the Service Target Performance Incentive Scheme (STPIS), Capital Expenditure Sharing Scheme (CESS), and Efficiency Benefit Sharing Scheme (EBSS). The consultation paper identifies these schemes as directly relevant to resilience expenditure [1]. While CESS and EBSS reward efficient expenditure and STPIS rewards reliability performance, resilience investments may improve restoration outcomes and reliability metrics in ways that affect incentive payments [1, 37].

The guidelines should therefore include safeguards against double counting. Where approved resilience expenditure materially improves reliability performance, the AER should clarify whether STPIS targets, exclusions, or adjustments are required [1, 2]. Otherwise, consumers may fund the investment through allowances and again through incentive rewards.

Similar safeguards are required for CESS and EBSS. The framework should distinguish genuine efficiency from delayed delivery, scope reduction, or non-delivery. Where more efficient alternatives emerge, benefits should flow to consumers while preserving incentives for innovation [9, 38, 39].

A proportionate safeguard framework should include:

- identification of resilience programs subject to incentive interaction;
- reporting of approved and actual expenditure, scope, timing, and outcomes;
- explanation of material underspend or overspend;
- assessment of whether reliability improvements are already funded through resilience allowances;
- consideration of STPIS target adjustments where resilience programs materially affect reliability outcomes;
- post-event assessment where major weather events influence incentive outcomes;
- transparent explanation of the relationship between resilience expenditure and incentive payments.

These measures would strengthen incentive regulation by ensuring that rewards reflect genuine efficiency and improved outcomes rather than accounting effects, forecast error, or double recovery [9, 38, 39]. They are also consistent with broader infrastructure-resilience principles emphasising adaptive investment and consumer value [5, 20, 22].

Key Principle: Resilience regulation should be stable enough to support efficient investment, but adaptive enough to respond when risk, performance, or evidence changes materially.

10. Concluding Statement

We support the AER's development of Network Resilience Guidelines and the objective of improving the regulatory treatment of resilience expenditure. As severe-weather events and climate-related risks become increasingly material to network performance and consumer outcomes, resilience should be assessed as an observable performance capability rather than a broad expenditure category.

The recommendations presented in this submission are intended to strengthen confidence that resilience expenditure is prudent, efficient, evidence-based, and capable of review. They seek to improve the definition of resilience, strengthen evidence requirements and reporting, clarify the role of DNSPs in supporting community resilience, and introduce adaptive governance mechanisms and incentive-scheme safeguards.

These measures do not require excessive regulatory complexity. Rather, they support a proportionate framework in which risks, assumptions, alternatives, expenditure, and outcomes remain visible throughout the investment lifecycle.

Resilience regulation must balance investment certainty with adaptive learning. A framework that approves expenditure without post-event visibility weakens accountability, while a framework that demands perfect certainty risks delaying necessary investment. The appropriate balance is one that supports timely action while requiring transparent evidence, measurable outcomes, and structured review when conditions change materially,

Final Principle: Customer-funded resilience expenditure should be supported by transparent evidence before approval and by observable performance outcomes after implementation.

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