

Submission on AusNet transmission determination 2027 to 2032

Authors

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Submission context

This submission addresses the AER's draft decision and AusNet's revised revenue proposal for 1 April 2027–31 March 2032. It examines the engineering evidence supporting expenditure on Victoria's existing transmission network, particularly disputed asset renewal, digital capability and investment timing.

1. Executive summary

We support investment needed to maintain safe, reliable transmission services. The AER should accept additional expenditure where AusNet demonstrates the failure mechanism, feasible intervention and achievable delivery date. Our contribution is a practical connection between asset diagnostics, calibrated failure risk, investment choice and operational acceptance. This connection is particularly important where replacement volumes depend on health scores, outage benefits depend on restoration assumptions, or digital expenditure delivers functions shared across platforms.

We recommend resolving disputed expenditure through project-specific evidence, consistent whole-life comparisons and proportionate delivery reporting. Figure 1 links the evidence needed to justify investment with verification of delivered capability. Necessary investment should proceed, while uncertain construction should follow justified preparatory work and objective triggers. Section 9 sets out the specific recommendations.

Engineering evidence for investment decisions

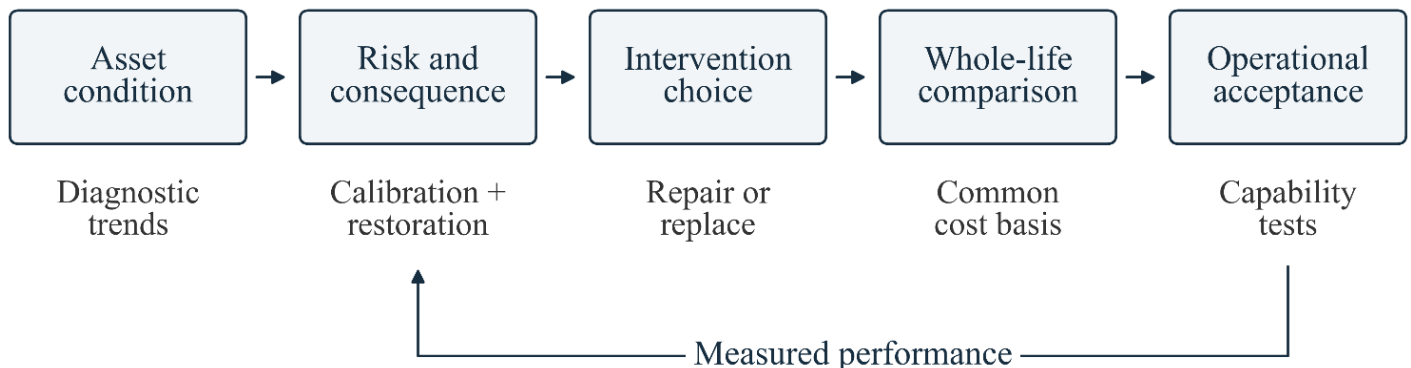


Figure 1. Engineering evidence supporting investment decisions, with measured performance informing risk calibration.

2. About CSPER and scope

CSPER researches power-system control, protection, storage and cyber-physical energy systems [1]. We apply that expertise to the draft decision [2], using British, European and US approaches [3-5] within Australia's regulatory framework. The assessment uses public documents and does not independently inspect assets, validate confidential models or certify project costs.

3. Regulatory context and disputed expenditure

The draft decision allows \$4,754.4 million in nominal smoothed revenue; AusNet's revised request is \$4,888 million. Gross capital expenditure is \$1,744.3 million versus \$2,419.5 million in real 2026–27 dollars, a \$675.2 million gap [2,6]. Gross and net figures must remain separate.

Disputes concern replacement scope, failure assumptions, restoration, risk allowances, tower resilience and digital expenditure. The revised digital operating step change is \$47.7 million against \$38.6 million in the draft. AusNet accepts rejection of the landholder-engagement step change and VicGrid-direction pass-through [6]. Transgrid and Ofgem provide precedents for scrutinising alternatives and engineering justification [7, 8].

4. Asset condition failure risk and intervention choice

Age and criticality alone do not establish replacement need. Ofgem rejected some interventions where condition or repair alternatives did not justify replacement [3]. AusNet corrected installation dates for 16 bushings but states that age does not enter its failure model [6]. The AER should verify equipment identity, diagnostic history and consistency between condition records and economic inputs.

Dissolved-gas trends, insulation measurements, partial discharge and thermal observations should identify deterioration mechanisms, interpreted against loading and maintenance [9]. Health scores require calibration to failure probability [10]. International reliability data provide a reasonableness check, with adjustments for design, duty and environment [11].

For Thomastown's eleven circuit breakers, the disputed aggregate modelled rate of 139% [6] requires clear interpretation. Expected fleet failure counts can exceed one; a single-event probability cannot. Calibration must distinguish failures, preventive removals and surviving assets. Restoration mitigations must moderate consequences [12]. Transgrid's 60% refurbishment and 40% replacement allowance illustrates option scrutiny, not an AusNet quota [7].

Replacement is justified when repair or monitored deferral cannot maintain required safety and service performance. Deferral should specify inspection intervals, escalation thresholds and an appropriate contingency response. Component-level diagnostic results should remain visible so an aggregate health score cannot conceal a degraded bushing, winding or switching component.

5. Digital investment and operational capability

AusNet reports removal of eight of twenty-two Advanced Energy Management System initiatives in the draft decision [6]. Assess remaining disputes by the decisions enabled, duplication avoided and acceptance tests. Sensing and communications require accurate timestamps, usable data, acceptable latency and safe fallback. FERC Order 881 requires ambient-adjusted ratings, without universally mandating dynamic ratings [13]. ACER emphasises performance indicators [14].

Cyber expenditure should separate mandatory compliance [15] from additional capability. Apply NIST's operational-technology guidance [16] through tested access controls, segmentation, backups and recovery. TasNetworks and Ofgem demonstrate support for justified cyber expenditure and accountable delivery [3, 17]. Include recurring licences, training and support in cost comparisons.

Replay studies and simulation should test loading changes, equipment outages and erroneous telemetry. Operational acceptance also requires integration into control-room procedures. These are proposed evidence requirements, not capabilities independently verified by CSPER.

6. Investment timing uncertainty and deliverability

Test revised connection-point forecasts against low, central and high demand, differentiating committed data-centre loads from speculative connections [6]. FERC's scenario planning offers a methodological precedent [18]. Supply-interruption duration must reflect switching, compatible spares and progressive restoration, rather than permanent replacement time [12].

Tower resilience should consider correlated failures, access restrictions and competing repair demands. British fragility modelling provides a suitable approach [19]. AusNet's reservation of capacity for up to 45 transformers [6] addresses supply constraints; installation still depends on labour, permits and outage windows. IEA procurement estimates reach four years for large transformers [20]. Transgrid triggers [7], Ofgem preparation funding [3] and European staged approvals [4] support conditional commitments where need remains uncertain.

Resilience benefits should reconcile reliability, safety and market effects without double counting. Procurement dates must be derived from feasible commissioning schedules, rather than selected independently of outage access.

7. Feasible alternatives and whole life costs

Compare maintenance, refurbishment, component renewal, replacement and non-network support against identical safety and service requirements [7, 12]. US dynamic-rating experience shows some upgrades can be avoided [21], but ratings cannot remedy structural deterioration. Storage requires adequate duration, recharge and contingency availability [22].

Use consistent demand scenarios, assessment periods, discount rates and terminal-value treatment. Include installation, outage staging, maintenance, losses, digital support, subsequent replacement and decommissioning. ENTSO-E provides consistent appraisal principles [23]; Ofgem links funding to risk reduction [24]. Avoid counting residual consequences and avoided-risk benefits twice.

8. Evidence and delivery accountability

Build on AER reporting [25] and AusNet's stakeholder-delivery commitment [6]. Use persistent project identifiers to link scope, forecast and incurred expenditure, commissioning and acceptance. Explain material deviations using evidence of delivered outcomes [26].

Separate installed equipment from usable capability, following US build and impact metrics [27]. Report post-intervention condition, residual risk, restoration readiness and digital availability against predefined baselines. Continuity and voltage-quality measures [28] should complement project tests. Use annual summaries, exception reports and targeted assurance, aggregating routine replacements and protecting sensitive evidence.

Report measured performance separately from modelled avoided failures. Define acceptance thresholds, measurement periods and accountable owners before commissioning; retain evidence for regulatory audit.

9. Consolidated recommendations

Recommendation	Proposed AER decision	Evidence required
R1 Asset renewal	Accept justified interventions; reassess unsupported volumes.	Diagnostics, calibrated failure probability and residual risk [12].
R2 Alternatives	Select the least-cost feasible intervention.	Equivalent service requirements and whole-life cost boundaries [12].
R3 Digital capability	Assess expenditure against operational functions.	Telemetry, failover, cybersecurity and operator acceptance [27].
R4 Timing	Validate commissioning across scenarios.	Demand commitment, restoration and feasible schedules [12, 18].
R5 Uncertainty	Separate preparation from uncertain construction.	Objective triggers and residual-risk limits [4].
R6 Accountability	Require proportionate delivery reporting.	Project identifiers connecting expenditure to accepted outcomes [26].

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