Revised Regulatory Proposal
Augex Summary

ERGON. ENERGY NETWORK

1 Executive Summary

The AER's Augex assessment for Ergon Energy in its Draft Decision considered in detail a range of proposals for the 2020-25 regulatory control period. The AER also identified some themes in terms of the adequacy of our investment proposals.

This document forms part of our Revised Regulatory Proposal (RRP). It addresses in detail our response to both the comprehensive feedback on individual business cases plus the general themes identified by the AER. It provides a linkage between the RRP document and the individual business cases that have been re-submitted to the AER.

We appreciate the feedback from the AER on a range of issues regarding our proposals. We also obtained feedback from customers on these proposals. In regard to some of our proposals, we've accepted the AER's position in the Draft Decision. For some of our other proposals we've worked to address the feedback from the AER's Draft Decision and address the issues identified both in this document plus in individual business cases.

Contents

1. Introduction

This document provides details of the changes we have made from the Regulatory Proposal to the Revised Regulatory Proposal in the Augex category in response to feedback that we have received from the AER and our customers.

1.1 Purpose of document

This document summarises the changes that have occurred between the Regulatory Proposal and the Revised Regulatory Proposal in Augex based on the feedback received from the AER in discussions and from the Draft Decision.

1.2 Scope of document

The scope of this document is limited to the areas where there have been material changes in our forecast Augex, or where there was specific feedback from the AER that we have to address as part of our Revised Regulatory Proposal. It does not include projects and programs that have been accepted as prudent and efficient expenditure by the AER in its Draft Decision.

1.3 Overview of Draft Decision

The table below has been extracted from AER's draft decision[1].

Table 1 : AER's Draft Decision on Augex

Table A.1 – Draft decision on Ergon Energy's total forecast augex ($ million, 2019–20)

Category	Proposal	Draft decision	Difference ($m)	Difference (%)
Subtransmission growth	65.2	42.4	-22.7	-35%
Distribution growth	95.6	95.6	0.0	0%
Network communications	69.6	19.1	-50.5	-72%
Power quality	13.8	9.2	-4.6	-33%
Worst performing feeders	4.1	4.1	0.0	0%
Total	248.3	170.5	-77.8	-31%

Source: Ergon Energy's proposal and AER analysis.

In this Revised Regulatory Proposal, we have carefully considered the feedback from the AER and our customers. We have reviewed our plans to determine whether there is scope to reduce capex by revisiting each project based on the specific feedback provided by the AER. We have examined the potential to make better use of existing assets and have reviewed programs where appropriate. In addition, we have examined the AER's feedback on some themes in terms of adequacy of our investment proposals and these themes have been addressed, as detailed below.

[1] AER Draft Decision, Ergon Energy Distribution Determination 2020-25, Attachment 5 Capital Expenditure, October 2019

2 How We've Addressed the AER's General Feedback

The AER has provided significant and valuable feedback in its draft decision regarding our capex proposals in general. Several key points have emerged from this feedback and each of these is discussed below:

2.1 Lack of Necessary Material to Demonstrate Prudency and Efficiency

What the AER Found: The AER found in its draft decision that we had sometimes not provided adequate supporting evidence that each of our proposals / business cases represented a prudent and efficient investment.

What We've Done: We've thoroughly reviewed each of our investment proposals and re-written our business cases as necessary. We've adopted several different approaches depending on the feedback:

- In some proposals, we've accepted that the investment is not required or that a better option is available – in these instances we've accepted the AER's reduction to our investment proposal.
- In other proposals we've examined the short-fall in our evidence base and re-written the business case to add additional evidence.
- In a number of proposals, we've tested the AER's assessment of our investment and provided clarifying comments and additional evidence to support our proposal.
- In every case that we've re-submitted, we've provided clearer and more succinct documentation to assist the AER in its review process.

2.2 Inadequate Cost Benefit Analysis

What the AER Found: The AER found in its draft decision that our business cases did not always provide a rigorous cost benefit analysis. The AER found that many of our business cases provided least cost options without any real examination of risks or benefits. The AER also found that our business cases did not test alternative options adequately through a rigorous sensitivity analysis.

What We've Done: We've thoroughly reviewed each of our investment proposals and re-written our business cases to address the AER's concerns. We've included the following key elements in every business case:

- A clear and well document business case, including a NPV analysis in every case. In a limited number of cases this remains a least NPV cost approach, however this is the only feasible approach in some cases and the rationale for this is fully documented.
- We've carried out sensitivity analysis, in every case where it is appropriate to do so.
- We've carried out a Value of Regret analysis in every case to provide greater insights into the merits of our proposed option.

2.3 Establish the Need for Investment and Address Capex Criteria

What the AER Found: The AER found in its draft decision that our business cases did not always clearly identify a need for investment. This is linked to a related finding that our proposals did not provide a rigorous cost benefit analysis.

What We've Done: We've thoroughly reviewed each of our investment proposals and re-written our business cases to address the AER's concerns. We've included the following key elements in every business case:

- We've included a section in every business case to clearly identify the need for the investment. This is linked to a range of drivers including compliance and risk.
- We've included a table in every business case that details the alignment of the proposal with the NER capital expenditure requirements as set out in Clause 6.5.7 of the NER.

2.4 Application of the Safety Net

In its Draft Decision, the AER outlined that it accepts Ergon Energy's Safety Net obligations that require us to limit the amount of load and number of customers without supply against predefined timeframes in the event of an outage. Table 2 below outlines the Safety Net criteria (extracted directly from Ergon Energy's Distribution Authority.

Table 2 – Ergon Energy Safety Net Criteria

Area	Targets
Regional Centre	Following an N-1 Event, load not supplied must be: • Less than 20 MVA (5,000 customers) after 1 hour; • Less than 15 MVA (3,600 customers) after 6 hours; • Less than 5 MVA (1,200 customers) after 12 hours and • Fully restored within 24 hours.
Rural Areas	Following an N-1 Event, load not supplied must be: • Less than 20 MVA (7,700 customers) after 1 hour; • Less than 15 MVA (5,800 customers) after 8 hours; • Less than 5 MVA (2,000 customers) after 18 hours and • Fully restored within 48 hours.

The table below shows how to apply the Safety Net to Regional Centres and Rural category substations.

Table 3 – Ergon Energy Safety Net Criteria Interpretation

Category	Demand Range	Allowed Outage Duration to be OK
Urban	>20MVA	No outage OK
	15-20MVA	60 minutes OK
	5-15MVA	6 hours OK
	<4MVA	12 hours OK
Rural	>20MVA	No outage OK
	15-40MVA	60 minutes OK
	5-15MVA	8 hours OK
	<5MVA	18 hours OK

In its Draft Decision, the AER appears to have applied the load thresholds and timeframes incorrectly in their assessment of some of Ergon Energy's augmentation projects.

2.5 Other Planning Criteria

In our analysis, we've applied a range of standards to identify network limitations that form the basis of our augmentation proposals. These standards are explained in detail on our Distribution Annual Planning Report, and the key elements in summary are:

- Safety Net: The safety net provisions arise from the Distribution Authority for Ergon Energy issued under section 195 of *Electricity Act 1994 (Queensland)*. These provisions mean that Ergon Energy will ensure, to the extent reasonably practicable, that it achieves its safety net targets as specified in the planning and design of its network.
- Minimum Service Standards (MSS): The MSS provisions arise from the Distribution Authority for Ergon Energy issued under section 195 of *Electricity Act 1994 (Queensland)*. These provisions mean that Ergon Energy must use all reasonable endeavours in the planning and design of its network to ensure that it does not exceed in a financial year the MSS.
- Voltage Limits: Ergon Energy uses a range of internal standards and modelling to ensure that voltage on the network complies with the provisions of the *Electricity Regulation 2006* pursuant to the *Electricity Act 1994 (Queensland)*, in relation to voltage.
- Distribution Feeder Utilisation: Ergon Energy has an internal Target Maximum Utilisation for distributions feeders. This utilisation figure has been designed to ensure that under outage conditions, adequate load transfers can be made between distribution feeders and between zone substations to enable supply restoration to occur to deliver Safety Net and MSS requirements.
- Fault Level Limitations: Ergon Energy plans its network to ensure that all plant and lines are able to withstand fault currents without causing damage to the equipment.

3 Other Changes Impacted our Revised Regulatory Response

3.1 Reduction in Weighted Average Cost of Capital (WACC)

As part of the Draft Decision, the regulated WACC has been reduced. Ergon Energy is now using 4.87% as its real vanilla WACC for its NPV analysis (2.62% real pre-tax). The effect of the reduction in WACC is to reduce the discounting of future cash flows, which lowers the value of deferring capital expenditure. This has had a particular effect on a number of business cases where the trade-off in lower upfront capital cost projects to delay larger investments is significant. Further discussion of the effect of the change in WACC can be seen in the discussions on each project as appropriate.

4 Specific Projects and Programs

In its Draft Decision the AER identified some specific projects and programs that need to be addressed in our RRP. These projects are discussed below.

4.1 Sub-transmission Growth

4.1.1 Cloncurry Reinforcement

What the AER Found[2]: The AER rejected the proposed expenditure for Cloncurry because Ergon Energy did not demonstrate the need for the investment based on the following concerns:

- The AER was of the view that an outage on the 66kV line will not cause a breach of the safety net criteria.
- Ergon Energy has installed a mobile generation connection point and this should help facilitate timely connection of a mobile generator
- The AER identified that Ergon Energy could dispatch and connect mobile generating units in time to enable supply restoration within 18 hours.
- AER asserted that installation of a standby transformer at Chumvale zone substation may be a cheaper option to provide supply in the event of a failure to meet safety net criteria.

What We've Done: We've thoroughly reviewed our investment proposal, reconsidering the options based on AER's feedback. Our further work includes the following:

- We've re-written this business case and provided a clear and succinct examination of the need for investment and the linkages to the NER capex criteria.
- We've re-done the NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis.
- We've reviewed the costs and timing for the provision of stand-by generation to Cloncurry and do not accept the AER's assertion that this can be achieved within 18 hours.
- We've included new options into the analysis to ensure that the options analysis is comprehensive.
- We've proposed the same option after a complete re-examination of the business case.
- Full details are provided in the business case for this project.

Cost Change Summary: The direct cost of the project remains unchanged at $5.8M.

4.1.2 Blackwater Substation Refurbishment

What the AER Found[3]: The AER largely rejected the proposed expenditure for Blackwater and substituted $1M capex to allow for reconnection of the transformers at Blackwater following replacement of Powerlink transformers. It rejected the need for the investment based on the following concerns:

- Ergon Energy's business case does not contain a base case and is NPV negative. Ergon Energy must have a positive NPV result as the primary driver is asset age and there is no compliance driver.
- Ergon Energy has provided only a qualitative risk assessment and the risks are low to moderate. The risks have not been quantified and included in the business case.

What We've Done: We've thoroughly reviewed our investment proposal, reconsidering the options based on the AER's feedback and introduced further options (a minimal works option and a single

[2] AER Draft Decision comments have been summarised, rather than repeated in full
[3] AER Draft Decision comments have been summarised, rather than repeated in full

transformer replacement option) for analysis. Our further work includes the following:

- We've re-written this business case and provided a clear and succinct examination of the need for investment and the linkages to the NER capex criteria.
- We've re-done the NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis. It should be noted that the business case is still not positive NPV, however there are strong condition-based drivers for replacement of some assets.
- We have included a counterfactual case, which assumes replacement of only the critical assets based on condition assessments.
- We have thoroughly reviewed the options and has proposed a lower cost approach deferring works to the extent possible. The proposed works include only critical asset replacements and reconnection to Powerlink transformers.
- Full details are provided in the business case for this project.

Cost Change Summary: The direct cost of the project has decreased from $7.5M to $1.9M due to the development of a modified approach that defers works to the extent possible.

4.1.3 Broxburn, Yarranlea Replacement and Reinforcement

What the AER Found[4]: In its Draft Decision the AER stated that *"Ergon Energy has demonstrated the need to increase capacity at Broxburn zone substation, but the transformer at Yarranlea is not yet due for replacement and capex for the transformer would be included in our modelled repex forecast[5].* The AER included capital of $3.2M being funding for the single transformer replacement at Broxburn.

What We've Done: We've thoroughly reviewed our investment proposal, considering the AER's feedback. Our further analysis and revised business case includes the following:

- We've re-written this business case and provided a clear and succinct examination of the need for investment and the linkages to the NER capex criteria.
- We've re-done the NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis.
- We have retained our proposal to include a skid substation at Broxburn based on demand and asset condition.
- We have obtained further detailed condition assessment in relation to the Yarranlea transformers and included capital costs for replacement of a Yarranlea transformer based on condition assessment.
- Ergon Energy rejects the notion that the costs for the transformer is included in modelled repex as these costs were removed from the modelled amounts.
- Full details are provided in the business case for this project.

Cost Change Summary: The direct cost of the project has increased from $6.3M to $7.8M.

4.1.4 East Bundaberg to Burnett Heads Reinforcement

What the AER Found[6]: In its Draft Decision, the AER stated that *"Ergon Energy has demonstrated that investment is required."* AER has also noted however, that it is not convinced that an additional feeder is required in the 2020-25 period and that this may be deferred through:

- Upgrading substation exit cables
- Rebalancing load between existing feeders

[4] AER Draft Decision comments have been summarised, rather than repeated in full
[5] AER, Attachment 5: Capital expenditure | Draft decision – Ergon Energy 2020-25, October 2019, p.5-20
[6] AER Draft Decision comments have been summarised, rather than repeated in full

- Installing or upgrading line regulator to address voltage constraints

To this end, AER allocated $0.5M to enable minor upgrade works to defer construction of a 66kV feeder.

What We've Done: We've thoroughly reviewed our investment proposal, considering the AER's feedback. Our further analysis and revised business case include the following:

- We've re-written this business case and provided a clear and succinct examination of the need for investment and the linkages to the NER capex criteria.
- We've re-done the NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis.
- We've reviewed our options for reinforcement including the cable upgrades, load shifts and further regulator upgrades proposed by the AER.
- Further information has been added to the business case on the extent to which upgrade and voltage mitigation works have already occurred on these feeders. Ergon Energy is of the view that it is impossible to provide further minor incremental improvements to deal with the known block load increases. Risk of long-term inability to supply is a significant risk and hence we propose to build the 66kV feeder to be utilised initially at 11kV.
- Full details are provided in the business case for this project.

Cost Change Summary: The direct cost of the project remains unchanged at $5.4M.

4.2 Power Quality

What the AER Found[7]: In its Draft Decision, the AER found:

- Ergon Energy proposed a total of $15.1M, including Power Quality (PQ) monitoring and, solar PV augex.
- AER accepted expenditure proposals for solar PV augex.
- AER rejected the PQ monitoring expenditure because Ergon Energy did not demonstrate the prudency and efficiency of the program based on the following concerns:
    - Ergon Energy assumed that each new PQ monitoring device would deliver a $1600 annual saving through avoiding quality of supply investigations. The AER asserted that Ergon Energy did not provide evidence to support this amount and that the average annual benefit of a monitor is $150.
    - Ergon Energy identified that it could avoid the installation of some voltage regulators and distribution transformer tap adjustments as a benefit of PQ monitoring. The AER asserted that PQ monitoring could not reduce these needs.
    - The AER identified that Ergon Energy did not include operational costs associated with PQ monitoring programs.

What We've Done: We've thoroughly reviewed our investment proposal, considering the AER's feedback. Our further analysis and revised business case now include the following:

- We've re-written this business case and provided a clear and succinct examination of the need for investment and the linkages to the NER capex criteria.
- We've re-done the NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis.
- We've provided more detail on the basis for justifying the savings delivered from PQ monitoring.

Cost Change Summary: There direct cost of the program remains unchanged at $15.1M.

[7] AER Draft Decision comments have been summarised, rather than repeated in full

4.3 Network Communications

We proposed some $69.6M for network communications, protection and control projects. The AER examined two major sub-categories as below and reduced the allowed expenditure for the total program to $19.1M. These two programs are discussed below.

4.3.1 Intelligent Grid Enablement

What the AER Found[8]: In its Draft Decision, the AER found:

- Ergon Energy has not justified the proposed program of $36.8M (joint with Energex) based on its concerns that:
    - Ergon Energy has not clearly identified the need for the program and has not provided NPV analysis showing how the benefits exceed the costs.
    - Ergon Energy has not provided enough information regarding each of the capabilities it is intended to achieve to show that the program is prudent and efficient.
    - AER has concerns about the base case assumptions.
    - Ergon Energy has not explained the interdependencies between this program and other programs such as ADMS and LV monitoring.

What We've Done: We've thoroughly reviewed our investment proposal, considering the AER's feedback. Our further analysis and revised business case include the following:

- We've re-written this business case and provided a clear and succinct examination of the need for investment and the linkages to the NER capex criteria.
- We've re-done the NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis.
- We've provided more detail on the basis for justifying the savings delivered from this program.
- We've written another paper (Energy Queensland Smart Network Overview) that explains the linkages between this business case and other related Intelligent Grid programs.

Cost Change Summary: The direct cost of the program has decreased from $36.8M to $30.2M following the rework of the business case.

4.3.2 Backup Protection Reach

What the AER Found[9]: In its Draft Decision, the AER found:

- Ergon Energy has not justified the proposed program of $23.4M based on the concerns:
    - Ergon Energy has identified the program based on a desk-top assessment only – field measurements are required to validate this assessment and demonstrate that the investment is prudent.
    - Ergon Energy has not provided enough evidence of the shortfall in protection coverage.
    - Ergon Energy's proposal did not provide any evidence on incidents that had occurred as a result of primary protection failure.

What We've Done: We've thoroughly reviewed our investment proposal, considering the AER's feedback. Our further analysis and revised business case include the following:

[8] AER Draft Decision comments have been summarised, rather than repeated in full
[9] AER Draft Decision comments have been summarised, rather than repeated in full

- We've re-written this business case and provided a clear and succinct examination of the need for investment and the linkages to the NER capex criteria and the NER protection requirements.
- We've re-done the NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis.
- We've shown how Ergon Energy has considered a range of options in regard to delivering prudent and efficient solutions to this compliance obligation.
- We've provided some examples where primary protection failures have occurred resulting in damage to the network.

Cost Change Summary: The direct cost of the program remains unchanged at $23.4M.

4.3.3 Protection Schemes

What the AER Found[10]: In its Draft Decision, the AER found:

- Ergon Energy provided justification for two components of the Protection Schemes business case – Sensitive Earth Fault Protection and Diverse Communication for Protection systems.
- Ergon Energy did not provide adequate justification for the component of the business case covering Distributed Energy Resources (DER) because:
    - Ergon Energy has not identified that there is a non-compliance issue in relation to DER protection because it did not identify any examples of cases where this is an issue.
    - It was unclear exactly what Ergon Energy was proposing to address the need and there was no options analysis.
    - Ergon Energy did not adequately quantify the risks to demonstrate the prudency and efficiency of the proposal.

What We've Done: We've thoroughly reviewed our investment proposal, considering the AER's feedback. Our further analysis and revised business case include the following:

- We've re-written this business case and provided a clear and succinct examination of the need for investment and the linkages to the NER capex criteria and the NER protection requirements.
- We've re-done the NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis.
- We've shown how Ergon Energy has considered a range of options in regard to delivering prudent and efficient solutions to this compliance obligation.
- We've provided some examples where protection failures have occurred in relation to DER coverage.

Cost Change Summary: The direct cost of the program has decreased from $11.5M to $8.9M following the rework of the business case.

4.3.4 Network Capacity and Coverage

What the AER Found[11]: In its Draft Decision, the AER found:

- Ergon Energy provided justification for the components of the Network Capacity and Coverage program apart from the Telecommunications Transmission augmentation component.
- Ergon Energy did not provide adequate justification for the component of the business case covering transmission augmentation since it included augmentation works covering additional fibre optic cable, without providing adequate evidence that it had adequately addressed the utilisation of existing fibre optic cables. AER is of the view that additional utilisation of the

[10] AER Draft Decision comments have been summarised, rather than repeated in full
[11] AER Draft Decision comments have been summarised, rather than repeated in full

existing fibre cables can be achieved by implementing multiplexing technology.

What We've Done: We've thoroughly reviewed our investment proposal, considering the AER's feedback. Our further analysis and revised business case include the following:

- We've re-written this business case and provided a clear and succinct examination of the need for investment and the linkages to the NER capex criteria and the NER protection requirements.
- We've re-done the NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis.
- We've shown how we have considered a range of options in regard to delivering prudent and efficient solutions to this proposal. In particular, we've examined a new option, based on AER's feedback, to provide new technology in combination with some communications augmentation to provide the overall outcome at a lower cost. The proposed new option reduces the proposed costs by $1.3M.

Cost Change Summary: The direct cost of the program has decreased from $13.0M to $11.7M following the proposal of a new option.