Revised Regulatory Proposal
Repex Summary

ERGON. ENERGY NETWORK

1 Executive Summary

The AER's Repex 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 our 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 our customers on these proposals. Regarding some of our proposals, we've accepted the AER's position in the Draft Decision. For some of our other proposals we have 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 Ergon Energy has made from the Regulatory Proposal to the Revised Regulatory Proposal in the Repex 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 Repex based on the feedback received from our discussions with the AER 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 Repex, or where there was specific feedback from the AER that we must address as part of our Revised Regulatory Proposal. It does not include projects and programs where the direct cost value we proposed 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 Repex

Table A.2 – Draft decision on Ergon Energy's total forecast repex ($ million, 2019–20)

	Ergon Energy's proposal	AER draft decision	Difference ($)	Difference (%)
Modelled repex	765.0	637.1	-127.9	-17%
Unmodelled repex	329.4	204.9	-124.5	-38%
Total	**1094.4**	**842.0**	**-252.4**	**-23%**

Source: Ergon Energy's reset RIN and AER analysis.

Note: Numbers may not sum due to rounding.

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 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 to the same level as originally proposed 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 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 address the 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 Risk Quantification

In its Draft Decision, the AER noted that Ergon Energy's business cases need to include risk quantification, especially in regard to our Repex programs. Ergon Energy and Energex have undertaken significant risk quantification as part of the RRP process. This work is detailed in the Aurecon Risk Quantification Methodology document. This risk quantification work has been modelled on the AER Industry Practice Application Note for Asset Replacement Planning[2] and it includes the following programs and projects.

Program / Project Name	Program / Project Description
Ergon Energy Clearance to Structure / Clearance to Ground (CTS/CTG)	Remediation program to address known clearance defects
Ergon Energy LV Services	Replacement program to address defective assets
Energex LV Services	Replacement program to address defective assets
Energy Queensland LV Safety program	Program of LV monitoring to detect neutral integrity failures
Ergon Energy Poles	Replacement program to address defective assets
Ergon Energy Pole Top Structures	Replacement program to address defective assets
Ergon Energy Childers to Gayndah feeder	Condition based replacement program of 66kV overhead line
Ergon Energy Circuit Breakers	Replacement program to address end of life equipment
Ergon Energy Power Transformers	Replacement program to address end of life equipment

2.5 Programs with a Large Safety Risk Component

An important part of our risk quantification assessments was to better understand the forward risk profile of critical distribution assets. These assets have caused a number of significant public safety incidents in recent years and the forward risk profile on many asset classes shows worsening trends.

We are committed to achieving reductions in safety risks So Far as Is Reasonably Practicable (SFAIRP) as required under Queensland's Electrical Safety legislation. To this end, we have increased some of the programs, within resource constraints, to reduce risk levels SFAIRP. The risk quantification process has shown that these increased programs are economically justified and provide clear evidence of the need for the programs. These programs, in both modelled and unmodelled repex categories are detailed below.

[2] AER Industry practice application note for asset replacement planning Jan 2019

3 Specific Projects and Programs – Modelled Repex

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.

3.1 Modelled Repex Programs – Need for Change

In its draft decision AER referred to a number of modelled programs and in large part, these have formed the basis for our risk quantification work. The following sections detail AER's findings on our modelled Repex programs and our RRP response. In most cases, the scope of the program remains unchanged; however, there are a number of programs were the magnitude of programs have been revised. The most significant change from the AER's Draft Decision is the overall reduction based on the top-down modelled outcome.

We note the AER's modelled result, however we believe that it is important given the AER's criticism of the lack of risk quantification, to re-submit individual business cases for critical modelled repex programs, especially those that impact safety.

These programs in total exceed the top-down modelled amount for our Repex. However, we believe that this additional expenditure is required given the increasing risk profiles of the asset classes. Further our commitment to public safety is supported by the relevant electrical safety legislation and our safety regulator, the Queensland Electrical Safety Office (ESO), The increasing risk profiles for some asset classes is supported by risk quantification work provided in the relevant business cases.

3.2 Individual Program

3.2.1 Pole Replacements

What the AER Found[3]: The AER provided significant commentary on the modelling approach used for pole replacements and pole staking / nailing programs. The draft decision did not specifically accept or reject Ergon Energy's pole remediation program; however, this program was impacted from the overall modelled repex program reductions, based on AER's top-down review.

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

- We have reviewed and modified our pole inspection criteria based on latest research, as documented in the business case. This modification has changed the forecast volumes of pole remediation work, based on recent defect history since the change was made.
- Risk quantification work has been completed for the pole replacement program.
- 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 options analysis, and NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis.
- Full details are provided in the business case for this project.

Cost Change Summary: The direct cost of the program has increased from $315.2M to $375.8M because of the change in forecast volumes of pole remediation work.

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

3.2.2 Power Transformers

What the AER Found[4]: The AER provided some limited commentary on the replacement program for Power Transformers. It noted in the Draft Decision as follows:

- Ergon Energy's program was based on condition assessment using Condition Based Risk Management (CBRM), which indicated that over 60 transformers could be replaced in the 2020-25 period using this approach.
- The AER identified that Ergon Energy was unclear why 31 power transformers were proposed in the program.
- The draft decision did not specifically accept or reject Ergon Energy's proposed Power Transformer program, however this program was impacted from the overall modelled repex program reductions, based on AER's top-down review.

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

- Risk quantification work has been completed for all sites with proposed power transformer replacement works.
- 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 options analysis, and NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis.
- Full details are provided in the business case for this project.

Cost Change Summary: The direct cost of the program remains unchanged at $36.7M.

3.2.3 Circuit Breakers

What the AER Found[5]: The AER did not provide any commentary on the replacement program for Substation Switchgear (CBs). The draft decision did not specifically accept or reject Ergon Energy's proposed CBs program, however this program was impacted from the overall modelled repex program reductions, based on AER's top-down review.

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:

- Risk quantification work has been completed for all sites with proposed CB replacement works.
- 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 options analysis, and NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis.
- Full details are provided in the business case for this project.

Cost Change Summary: The direct cost of the program remains unchanged at $45.6M.

3.2.4 Low Voltage Services

What the AER Found[6]: The AER did not provide any commentary on the replacement program for Ergon's LV Services. The draft decision did not specifically accept or reject Ergon Energy's proposed program; however, this program was impacted from the overall modelled repex program reductions,

[4] AER Draft Decision comments have been summarised, rather than repeated in full
[5] AER Draft Decision comments have been summarised, rather than repeated in full
[6] AER Draft Decision comments have been summarised, rather than repeated in full

based on AER's top-down review.

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:

- Risk quantification work has been completed for the LV services population and proposed replacement program.
- 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 options analysis, and NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis.
- Full details are provided in the business case for this project.

Cost Change Summary: The direct cost of the program has decreased from $60.3M to $55.2M due to a revision of unit costs used in the analysis.

3.2.5 Childers-Gayndah Feeder Replacement

What the AER Found[7]: The AER provided significant commentary on this replacement project as follows:

- Ergon Energy did not conduct a full risk-quantified NPV analysis, but rather presented a least cost NPV analysis.
- Ergon Energy's modelling for this project shows that the economically efficient solution should be to "Do Nothing".
- Ergon Energy has materially overstated the safety risks.

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

- Risk quantification work has been completed for the 66kV feeder system supplying this area.
- Detailed estimates have been re-done to eliminate contingency allowances and estimation risk. This has resulted in an increased cost for the proposed option.
- Alternative options have been considered taking into account the broader network considerations, and not just the like-for-like feeder replacement.
- 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 options analysis, and NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis.
- Full details are provided in the business case for this project.

Cost Change Summary: The direct cost of the program has increased from $38.1M to $52.6M following the development of more detailed cost estimates.

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

4 Specific Projects and Programs – Unmodelled Repex

4.1.1 LV Safety

What the AER Found[8]: The AER provided significant commentary on this program that Ergon Energy did not adequately justify this program as follows:

- Ergon Energy did not provide sufficient material that the current programs (LV Services replacements) are inadequate.
- There was inadequate options analysis to support the program.
- Ergon's program of service inspection and replacement appears to be in line with industry best practice and there has been no change in regulatory obligations.
- The costs may be grossly disproportionate to the benefits from the program.
- The program does not solve the cause of the risk that it is trying to mitigate.

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:

- Risk quantification work has been completed for both the Energex and Ergon Energy LV services replacement programs. In this analysis we found that significant risks remain after the services replacement programs are completed. Further to this, experience from our own trials, plus experience interstate has shown that monitoring of LV electrical quantities can provide immediate identification of dangerous broken neutral situations. These situations would only otherwise be detected by periodic inspection programs or by a shock complaint from a customer. Given the safety risks from broken neutral conductors and related customer and network connection components, a further program can be justified based on safety risk mitigation.
- We've completed the risk assessment for both Ergon Energy and Energex and an overall LV safety monitoring approach.
- Alternative options have been considered taking into account other viable options to reduce customer safety risks.
- 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 options analysis, and NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis.
- We've proposed an approach that does not depend on a specific technology, but rather can use network quantities from Smart meters or from purpose-build monitoring devices.
- Full details are provided in the business case for this project.

Cost Change Summary: The direct cost of the Ergon Energy component of the program remain unchanged at $58.0M.

4.1.2 Pole Top Replacements

What the AER Found[9]: The AER did not comment on the pole top replacement program, other than to note that this program required further inspection based on the AER's trend analysis. The draft decision did not specifically accept or reject Ergon Energy's pole top remediation program; however, this program is a critical component of our safety program and given these comments we've opted to re-submit this program with additional justification.

[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

What We've Done: We've thoroughly reviewed our investment proposal, in light of the critical nature of this program and the results of risk quantification work. Our further work includes the following:

- Risk quantification work has been completed for the pole-top replacement program.
- 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 options analysis, and NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis.
- Full details are provided in the business case for this project.

Cost Change Summary: The direct cost of the program remains unchanged at $142M.

4.1.3 Clearance Program

We have conducted several aerial based inspection programs on our assets in recent years. Since the lodgement of our Regulatory Proposal on 31 January 2019, we have received further information based on the latest aerial program. This inspection program shows significant numbers of Clearance to Structure (CTS) and Clearance to Ground (CTG) defects. In addition to these directly identified defects, Ergon Energy has further identified a significant number of predicted defects based on maximum summer temperature conditions that could result in larger conductor sags.

What the AER Found[10]: The AER did not comment on Ergon Energy's CTS/CTG program, however since our regulatory proposal we have identified that a significant amount of work is required to remedy known defects.

What We've Done: We have developed a new investment proposal, in light of the new information, critical nature of this program, and the results of risk quantification work. Our work includes the following:

- Risk quantification work has been completed for the CTS/CTG program.
- We've 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 examined a range of options to deliver the work, and NPV analysis to provide the overall preferred approach. This includes a detailed sensitivity analysis, and Value of Regret Analysis.
- Full details are provided in the business case for this project.

Cost Change Summary: The direct cost of this program has increased from $14M to $150M. Originally, the direct cost of this program was spread over several replacement expenditure justification documents and totalled $2.8M/year across the period. The cost estimate has been revised following the development of this dedicated investment proposal for clearance work, which estimates that the required works will cost $30M/year across the period.

4.1.4 Instrument Transformer Program

What the AER Found[11]: AER did not comment on the Instrument Transformer replacement program. The draft decision did not specifically accept or reject Ergon Energy's program; however, this program is a critical component of our safety program.

What We've Done: We've thoroughly reviewed our investment proposal, in light of the critical nature of this program. 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.

[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

- We've re-done the options analysis, and NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis.
- Full details are provided in the business case for this project.

Cost Change Summary: The direct cost of the program remains unchanged at $30.7M.

4.1.5 Various Unmodelled Programs

What the AER Found[12]: The AER did not comment on a range of other unmodelled replacement programs. However, it did note in its draft decision that the "other" asset group program required further inspection based on the AER's trend analysis.

What We've Done: We've thoroughly reviewed our investment proposals for a range of the smaller value proposals in the communications / control systems areas. We've re-submitted these business cases as part of the RRP to enable the AER to further review these programs as necessary:

- Energy Queensland Duplicate DC Supplies
- Ergon Energy Communications Site Infrastructure
- Ergon Energy Life Extension of Legacy Data Communications
- Ergon Energy Obsolete Data Comms (formerly Intelligent grid data comms)
- Ergon Energy Field Mobile Voice Communications
- Ergon Energy Communications Power Systems
- Ergon Energy Fixed Voice Communications
- Energy Queensland OT Environment

Our further work includes the following:

- We've re-written these business cases and provided a clear and succinct examination of the need for each investment and the linkages to the NER capex criteria.
- We've re-done the options analysis, and NPV analysis to address the AER's concerns, including a detailed sensitivity analysis, and Value of Regret Analysis.
- Full details are provided in the business case for this project.

Cost Change Summary: The direct cost of most of the unmodeled programs remains unchanged, and is indicated for each below:

- Energy Queensland Duplicate DC Supplies (EE - $3.7M, EGX - $6.2M)
- Ergon Energy Communications Site Infrastructure ($2.4M)
- Ergon Energy Life Extension of Legacy Data Communications ($5.2M)
- Ergon Energy Obsolete Data Comms ($18.6M)
- Ergon Energy Field Mobile Voice Communications ($4.4M)
- Ergon Energy Communications Power Systems ($4.1M)

Two of the programs have seen an increase in direct cost:

- Ergon Energy Fixed Voice Communications has increased from $1.5M to $3.3M following the rework of the business case.
- Energy Queensland OT Environment has increased from $2.1M to $2.9M following the rework of the business case.

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