

PROJECT ENERGYCONNECT

Contingent Project Application for the South Australian component

30 September 2020

Project EnergyConnect: Contingent Project Application for the South Australian component

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Executive Summary

Project EnergyConnect is a landmark project that will deliver the first new electricity interconnector between Australian States in 15 years, providing benefits to customers across the National Electricity Market and supporting the ongoing transformation of the power system.

The Project involves the construction of a new high voltage interconnector over a route of approximately 860 km between the electricity networks of South Australia at Robertstown and New South Wales at Wagga Wagga, together with a spur line linking to Victoria at Red Cliffs.

Project EnergyConnect forms a central feature of the roadmap for the transition of the power system developed by the Australian Energy Market Operator (AEMO) in its 2020 Integrated System Plan (ISP). The ISP classified Project EnergyConnect as an 'actionable ISP project' which will deliver net market benefits and support energy market transition through:¹

- Lowering dispatch costs, initially in South Australia, through increasing access to supply options across regions.
- Facilitating the transition to a lower carbon emissions future and the adoption of new technologies, through improved access to high quality renewable resources across regions.
- Enhancing security of electricity supply in South Australia.

The Project will deliver immediate and ongoing benefits to customers across the interconnected market. In particular:

- For customers in New South Wales, the interconnector will improve diversity of supply and access to cheaper renewable energy sources as the coal fleet progressively retires, while also unlocking significant renewable energy development along the route.
- For customers in South Australia, the interconnector will provide access to additional capacity when needed to replace expensive gas generation and improve power system resilience and security.

This application follows a comprehensive economic assessment ElectraNet undertook under the Regulatory Investment Test for Transmission (RIT-T) over 2016 to 2019 in consultation with stakeholders which concluded that Project EnergyConnect was the preferred option that delivered the greatest net market benefits. The Australian Energy Regulator (AER) issued a formal determination in January 2020 approving this outcome.

Since that time, there have been significant changes in both project costs and benefits compared with those assessed in the RIT-T. ElectraNet has undertaken an updated cost benefit analysis to confirm the economic case for the Project, based on updated inputs and assumptions aligned closely with AEMO's 2020 ISP, and sought expert advice to validate the assumptions in key areas.

This analysis continues to show that Project EnergyConnect remains the preferred option and delivers positive net market benefits to customers.



¹ AEMO, <u>2020 Integrated System Plan</u>, July 2020, p.86.

Increased benefits could be expected under the majority of alternative scenarios considered in the AEMO ISP, demonstrating that the Project remains robust under a range of possible futures. This also underscores AEMO's recognition of Project EnergyConnect as an "essential foundational measure" to address emerging system security risks that are growing year on year.

Taken together, this provides confidence that the economic case for the project remains strong as an investment essential to Australia's energy future.

The Project will be delivered by ElectraNet and TransGrid as the respective transmission network operators in South Australia and New South Wales, subject to receiving all necessary environmental and regulatory approvals.

As the final step in the regulatory approval process, this Contingent Project Application (Application) to the AER now seeks the capital expenditure and revenue required to deliver the South Australian component of the Project. A corresponding application will be lodged by TransGrid for the New South Wales component.

The capital costs for the Project have been updated since the time of the RIT-T assessment to reflect the outcomes of detailed project planning and competitive procurement processes. Most of the Project costs are based on market pricing, providing confidence that the capital expenditure forecast reflects the efficient and prudent costs of delivering the approved solution.

The capital expenditure forecast for the South Australian component of the Project as set out in this application is \$470.7 million (\$2017-18). Competitive market pricing makes up most of these costs.

Subject to satisfactory regulatory and other approvals, ElectraNet is currently working towards completing construction by 31 December 2023, and will continue to look for opportunities to deliver the Project earlier, if feasible.

The map below shows the interconnector route.

Line Route for Project EnergyConnect





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1. Introduction

1.1 Overview

This Application is submitted to the Australian Energy Regulator (AER) to amend ElectraNet's revenue determination for the 2018-19 to 2022-23 regulatory control period to approve the total capital and operating expenditure required to deliver the South Australian component of Project EnergyConnect (the Project). The information provided in this Application complies with the Rules requirements, as set out in clause 6A.8.2.²

In April 2018, the AER accepted our revenue proposal for the 2018-19 to 2022-23 regulatory control period, which classified the Project as a contingent project.³ As such, the AER's final decision allows the determination to be varied to include a revenue allowance for the Project, if the following trigger events are satisfied:⁴

- 1. Successful completion of the Regulatory Investment Test for Transmission (RIT-T) with the identification of a preferred option or options:
 - (i) demonstrating positive net economic benefits; and/or
 - (ii) addressing a reliability corrective action.
- 2. Determination by the AER that the proposed investment satisfies the RIT-T.
- 3. ElectraNet Board commitment to proceed with the Project subject to the AER amending the revenue determination pursuant to the Rules.

As detailed in section 3.2 of this Application, these trigger events have been satisfied.

1.2 Structure of this Application

The remainder of this Application is structured as follows:

- Chapter 2 provides an overview of the Project and the RIT-T process;
- Chapter 3 sets out the regulatory requirements for this Application;
- Chapter 4 sets out the forecast capital expenditure requirements for the Project;
- Chapter 5 sets out the forecast incremental operating expenditure requirement for the Project to the end of the regulatory control period; and
- Chapter 6 sets out the incremental revenue required to the end of the regulatory control period for the Project, together with the expected benefits for customers.
- ² Savings and transitional provisions also apply, which refer to 'SA-NSW Interconnector Projects' in clause 11.114.1 of the Rules, in Part ZZZP which deals with early implementation of 'ISP priority projects'.

⁴ AER, *Final Decision, Attachment 6 – Capex*, p. 19. A fourth trigger event specified in the determination is not applicable, as set out in Table 3-1.



³ AER, *Final Decision: ElectraNet transmission determination 2018 to 2023, Attachment 6 – Capital expenditure,* April 2018, p. 6 – noting that Project EnergyConnect is described as 'South Australian Energy Transformation'.

The following attachments form part of our Application:

- *Project Scope Summary* provides a detailed description of the required scope of works to deliver the Project.
- *Post-Tax Revenue Model (PTRM)* is the AER's model used to calculate the required incremental revenue for the remainder of the current regulatory control period.
- *Cost Estimate Report* sets out the detailed assumptions underpinning the expenditure forecasts, the procurement and delivery strategy and risk assessment framework.
- ACIL Price Impact Report provides information on the estimated customer price benefits of the Project.

Further supporting documentation has also been provided to the AER on a commercialin-confidence basis, including detailed capital cost inputs and estimates, a project risk register and procurement information.



2. **Project Summary**

2.1 Project scope

Project EnergyConnect involves the construction of a 860 kilometre interconnector linking Robertstown in mid-north South Australia (SA) and Wagga Wagga in New South Wales (NSW) via Buronga, with an extension linking Buronga with Red Cliffs in Victoria. The interconnector will provide 800 MW of nominal transfer capacity in both directions.

The scope of works in SA (the subject of this Application) includes:

- A new 190 km 330 kV double circuit line from Robertstown to the NSW border;
- A new 330 kV substation at Bundey near Robertstown including 275/330 kV transformers;
- A new 275 kV line between Bundey and Robertstown and associated augmentation works at Robertstown substation, including static and dynamic reactive plant;
- Turning the existing 275 kV line between Robertstown and Para into Tungkillo;
- A Special Protection Scheme to detect and manage the loss of either of the alternating current interconnectors from SA; and
- Associated power system studies, commissioning works and inter-network testing.

The scope of works in NSW (the subject of a separate Contingent Project Application from TransGrid) includes:

- A new 670 km 330 kV double circuit line from the SA border to Buronga to Dinawan to Wagga Wagga;
- Rebuild of 220 kV line from Buronga to Red Cliffs in Victoria as a double circuit line;
- New 330 kV Phase Shifting Transformers at Buronga (in order to share power transfers between new and existing interconnectors) and 330/220 kV transformers;
- Augmentation works at the Buronga, Wagga Wagga and Red Cliffs substations;
- A new 330 kV switching station at Dinawan;
- Static and dynamic reactive plant at Buronga and Dinawan; and
- Associated power system studies, commissioning works and testing.

Project EnergyConnect has been declared to be Critical State Significant Infrastructure for NSW⁵ and a 'Major Development'⁶ for SA. As a result, the SA Government has provided an expedited planning approval process in consultation with the Commonwealth Government and has also supported a range of early works activities.



⁵ Media Release, NSW Planning and Public Spaces Minister Rob Stokes, 29 August 2019.

⁶ Media Release, SA Premier Steven Marshall, 27 June 2019.



Figure 1: Network route for Project EnergyConnect

Further information is provided in the project scope summary which accompanies this Application.

2.2 Regulatory Investment Test for Transmission

In 2016, ElectraNet began exploring options to reduce the cost of providing secure and reliable electricity, enhance power system security in SA, and facilitate the long-term transition of the energy sector across the National Electricity Market (NEM) to low emission energy sources.

In November 2016, we released a Project Specification Consultation Report (PSCR)⁷ that explored the technical and economic feasibility of a new interconnector between SA and the eastern states as well as other non-interconnector solutions, through the SA Energy Transformation RIT-T.

We investigated variants of four credible options to address the identified need, comprising an optimised 'non-interconnector' option (comprising both network and non-network components) as well as options involving new interconnectors to each of the three neighbouring NEM regions.

⁷ ElectraNet, <u>South Australian Energy Transformation RIT-T: Project Specification Consultation Report</u>, 7 November 2016.



In June 2018, we published a Project Assessment Draft Report (PADR)⁸ which showed that a new 330 kV interconnector between Robertstown in mid-north SA and Wagga Wagga in NSW, via Buronga, was expected to deliver the greatest net market benefit.

We worked closely with the Australian Energy Market Operator (AEMO) to coordinate the PADR modelling with the development of AEMO's inaugural Integrated System Plan (ISP) in 2018. The PADR also considered AEMO's concurrent Western Victoria Renewable Integration RIT-T and the identification of priority Renewable Energy Zones (REZs) in the Riverland and Murray River areas of SA and NSW.

On 13 February 2019, we concluded the RIT-T assessment with the publication of the PACR⁹, which confirmed that a new interconnector between SA and NSW would deliver substantial economic benefits as soon as it can be built.

The PACR refined the previous preferred option to include a transmission augmentation between Buronga in NSW and Red Cliffs in Victoria. The benefit from this additional investment was identified by AEMO in the course of investigations for its Western Victoria RIT-T, following close consultation with ElectraNet and TransGrid.¹⁰

A summary of the benefits to be delivered by the Project is provided in Figure 2 below.



Figure 2: Benefits to be delivered by Project EnergyConnect

⁸ ElectraNet, <u>South Australian Energy Transformation RIT-T: Project Assessment Draft Report</u>, 29 June 2018.

- ⁹ ElectraNet, <u>South Australian Energy Transformation RIT-T: Project Assessment Conclusions Report</u>, 13 February 2019.
- ¹⁰ Further information on this modelling is provided in Appendix E of the PACR.



For NSW customers, the interconnector improves diversity of supply and access to cheaper renewable energy sources as the coal fleet progressively retires, while also unlocking significant renewable energy development along the route.

For SA customers, the interconnector provides access to additional capacity when needed to replace expensive gas generation and improves power system resilience and security.

2.3 AER's RIT-T Determination

On 11 April 2019, we submitted a formal request to the AER for a determination that the preferred option identified in our PACR for Project EnergyConnect satisfies the requirements of the RIT-T, in accordance with clause 5.16.6 of the Rules.

On 20 January 2020, the AER made a determination approving the RIT-T assessment and concluding that Project EnergyConnect was the preferred option that satisfies the RIT-T requirements¹¹.

While the AER concluded that it is "satisfied the RIT-T has been successfully completed", it also noted that "any significant changes to the costs of the preferred option could have a material impact on the outcome of the RIT-T".

The AER's determination also highlighted that if the costs of the Project or any other inputs that may affect market benefits differed materially from those presented in the RIT-T, the AER would expect us to consider whether there is a change in circumstances such that the RIT-T should be reapplied, and to provide evidence of that consideration to the AER.¹²

Accordingly, we have undertaken an updated cost benefit assessment to consider whether there has been a material change in circumstances based on the latest information.

2.4 AEMO 2020 ISP

On 30 July 2020, AEMO released its 2020 ISP identifying Project EnergyConnect as a central part of the roadmap for the transition of the power system.

The 2020 ISP classified Project EnergyConnect as an 'actionable ISP project' which will deliver net market benefits and support energy market transition through:¹³

• Lowering dispatch costs, initially in SA, through increasing access to supply options across regions;



¹¹ AER, <u>Decision: South Australian Energy Transformation: Determination that the preferred option satisfies the</u> <u>regulatory investment test for transmission</u>, January 2020.

¹² Ibid, p. 11.

¹³ AEMO, <u>2020 Integrated System Plan</u>, July 2020, p.86.

- Facilitating the transition to a lower carbon emissions future and the adoption of new technologies, through improving access to high quality renewable resources across regions; and
- Enhancing security of electricity supply in SA.

AEMO finds that Project EnergyConnect is required immediately in all scenarios it has considered in the ISP.

2.5 Updated Cost Benefit Analysis

The Rules (specifically clause 5.16.4 (z3)) require ElectraNet to consider whether, in its reasonable opinion, there has been a "material change in circumstances" that might lead to a change in the preferred option and thereby potentially require reapplication of the RIT-T.

Following the publication of the AER's determination, there have been significant changes in the costs and benefits of Project EnergyConnect compared to the assessment undertaken in the RIT-T.

In particular, a general increase in transmission costs is being experienced across the NEM, with AEMO incorporating a 30% increase in costs in its 2020 ISP for transmission projects. A range of key input assumptions contributing to market benefits have also changed.

Accordingly, we have undertaken an updated cost benefit analysis taking into account updated information on both costs and benefits, aligning with the inputs and assumptions in the 2020 ISP. Key updates include demand forecasts, committed generation projects, gas prices, coal prices, new entrant generator capital costs, ISP projects and Renewable Energy Targets.

In its RIT-T determination, the AER disagreed with applying Minimum Capacity Factors (MCFs) assumed in our PACR analysis for SA gas plants in the modelling of market benefits. To address this concern, we have worked closely with AEMO to consider a more accurate representation of these generators' operation with the MCFs removed.

Following consultation undertaken with stakeholders on the use of variable heat rates in July and August 2020, our updated cost benefit analysis incorporates updated variable heat rates, developed with the assistance of Aurecon. The updated assumptions are closely aligned with AEMO's calculated values in the 2020 ISP.

AEMO has identified new emerging system security requirements for SA due to the continuing growth of distributed energy resources and reducing minimum demand levels. These new requirements have also been reflected in our updated cost benefit analysis.

The updated cost-benefit analysis confirms that Project EnergyConnect remains the preferred option and continues to deliver positive net market benefits.



In particular, the outcomes of the finalised cost benefit assessment demonstrate that:

- Capital costs have risen from \$1.53bn to \$2.43bn (\$2018-19) while gross benefits have risen from \$1,246m to \$1,866m in present value terms from the January 2020 RIT-T determination;
- The Project delivers a positive net benefit of \$148m in present value terms after taking into account the updated information on benefits and costs;
- The outcome remains robust to further capital cost movements up to a break-even capital cost of \$2.7bn (\$2018-19);
- Net benefits would increase with later delivery of VNI West (as expected under most ISP scenarios) by between \$115m and \$176m in present value terms; and
- The closest ranked alternative, Victorian Option D, is found to deliver minimal net benefits and remains a less preferable option.

On the basis of this updated cost benefit analysis, ElectraNet concludes that there has been no material change in circumstances as defined in the Rules and the outcome of the RIT-T remains unchanged, consistent with the AER's RIT-T Determination.

We have provided the results of the updated analysis to the AER for formal confirmation.

2.6 Stakeholder engagement

Customer and stakeholder engagement and consultation have been a central feature throughout the development of this Project to ensure the identified need for investment, as well as the options to address it, were thoroughly tested. The extent of engagement and consultation on the RIT-T, which took over two years to complete, exceeded that of any other RIT-T undertaken in the NEM and ensures the assessment has been as thorough as possible.

In addition to the three required RIT-T documents (the PSCR, PADR and PACR) we released a wide range of supplementary reports, spreadsheet models, cost estimates, technical information and modelling methodology documents together with reports from independent consultants that further investigate matters raised in submissions, and independent customer price analysis.

Following the publication of the PADR, we held separate public forums and 'deep dive' sessions in both Adelaide and Sydney, to help explain the assessment and to hear stakeholders' views. These sessions facilitated review and discussion of the assessment with interested parties and ensured stakeholders had an open forum to raise questions and queries outside of the formal submission process.

Following these forums, we released further material in response to stakeholder requests to provide additional detail on the economic and wholesale market modelling undertaken, as well as further information on the specification of the credible options assessed.



Our RIT-T assessment benefited from extensive stakeholder engagement having received over 70 submissions to the PSCR and PADR. Our PACR provided a detailed consideration and response to the matters raised by stakeholders.

All consultation materials, submissions received, and actions taken to address feedback from stakeholders in relation to the RIT-T process are available on our website¹⁴.

Following the conclusion of the RIT-T process in early 2019, we have continued to engage with stakeholders alongside our project partner, TransGrid. The purpose of the engagement is to continue to inform customers and other stakeholders about the SA-NSW interconnector and to allow them to provide their views and perspectives on the Project.

This has included a number of individual briefings, bi-lateral meetings and stakeholder forums, including:

- Project EnergyConnect stakeholder forum on 25 July 2019, held in Sydney, and
- Project EnergyConnect stakeholder forum on 21 October 2019, held in Adelaide.

In the course of our updated cost-benefit analysis we also held a stakeholder webinar on 20 August 2020 and will shortly be publishing the full results of our updated cost-benefit analysis.

We have also undertaken extensive local engagement with the communities along the interconnector route and other stakeholders interested in the Project.

We will continue to engage with our customers and other stakeholders throughout the remaining stages of the regulatory approval process and during the delivery of the Project.

2.7 Next Steps

We are now proceeding to deliver Project EnergyConnect. The next steps involve:

- Assessment by the AER of the expenditure and revenue requirements to deliver the Project, as set out in this Application;
- Obtaining all necessary Board approvals from ElectraNet and TransGrid;
- Concluding competitive procurement processes and finalising the design and construction contracts with relevant suppliers;
- Completing environmental, cultural and development approvals; and
- Commencing the required construction works.

¹⁴ See <u>https://www.electranet.com.au/projects/south-australian-energy-transformation/</u>.



3. **Regulatory Requirements**

The regulatory requirements for contingent projects are contained in clause 6A.8.2 of the Rules and in the AER's Process Guideline for Contingent Project Applications.¹⁵ The remainder of this chapter sets out:

- The key information requirements to obtain an amendment to our revenue determination in relation to Project EnergyConnect;
- Further information on the contingent project trigger events and confirmation that each of these trigger events has been satisfied for the Project;
- Details of the commencement date and expected completion date for the Project, noting that the latter may be subject to change; and
- An overview of the pre-lodgement consultation we have undertaken jointly with TransGrid.

3.1 Information requirements to amend our revenue determination

Clause 6A.8.2 of the Rules sets out the requirements for making an application to amend a revenue determination to include a contingent project, modified for Project EnergyConnect by the savings and transitional provisions in clause 11.114.3. In particular, clause 6A.8.2(b) sets out the information that the application must provide, specifically:

- An explanation that substantiates the occurrence of the trigger event;
- A forecast of the total capital expenditure for the contingent project;
- A forecast of the capital and incremental operating expenditure, for each remaining regulatory year which the Transmission Network Service Provider (TNSP) considers is reasonably required for the purpose of undertaking the contingent project;
- How the forecast of the total capital expenditure for the contingent project meets the Rule threshold;
- The intended date for commencing the contingent project (which must be during the regulatory control period);
- The anticipated date for completing the contingent project (which may be after the end of the regulatory control period); and
- An estimate of the incremental revenue which the TNSP considers is likely to be required in each remaining regulatory year of the regulatory control period as a result of the contingent project being undertaken.

¹⁵ AER, <u>Process Guideline for Contingent Project Applications under the National Electricity Rules</u>, September 2007.



Clause 6A.8.2(f) requires the AER to accept the relevant amounts in the Application if it is satisfied that the amounts of forecast capital expenditure and incremental operating expenditure reasonably reflect the capital expenditure criteria and operating expenditure criteria, taking into account the capital expenditure factors and operating expenditure factors, in the context of the contingent project.

Chapters 4 and 5 of this Application set out the capital and incremental operating expenditure requirements for the Project respectively, together with the assumptions and methodology used to arrive at these forecasts. The incremental revenue required for this Project and corresponding benefit to be delivered to customers is set out in Chapter 6.

For completeness, Appendix A provides a checklist which demonstrates how the regulatory requirements for this Application have been addressed.

3.2 Trigger Events

Clause 6A.8.2(b)(1) requires ElectraNet to substantiate the occurrence of each trigger event relevant to a contingent project. A Contingent Project Application must be lodged as soon as practicable after the occurrence of the applicable trigger event(s).¹⁶

The applicable trigger events approved by the AER in respect of the Project have all been satisfied as outlined in Table 3-1 below. It should be noted that the trigger event refers to Project EnergyConnect as the 'South Australian Energy Transformation' as the RIT-T process was known.

¹⁶ In accordance with clause 6A.8.2(a1) of the Rules.



Trigger event	Status
 Successful completion of the South Australian Energy Transformation RIT-T with the identification of a preferred option or options: demonstrating positive net economic benefits, and/or addressing a reliability corrective action. 	Complete. On 13 February 2019, ElectraNet published a PACR for the South Australian Energy Transformation RIT-T in which the preferred option demonstrated positive net economic benefits.
 Determination by the AER that the proposed investment satisfies the RIT-T. 	Complete. On 24 January 2020, the AER published its RIT-T Determination that confirmed the preferred option satisfied the RIT-T. The conditions of that decision have also been satisfied as explained in section 2.4.
 ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules. 	Complete. On 29 September 2020 the Board of ElectraNet committed to proceed with the Project, subject to the AER awarding incremental regulated revenue commensurate with the capital and operating costs for ElectraNet's section of the project, ElectraNet obtaining funding as necessary and on terms satisfactory to it, and the Board of TransGrid making a firm commitment to proceed with the NSW component of the Project following the AER's revenue determination on its corresponding application. A copy of the Board's commitment is provided in Appendix B of this Application.
4. Clauses 1 and 2 do not apply if a change in the law occurs that allows the inclusion of the proposed investment in ElectraNet's maximum allowed revenue under this revenue determination even if a RIT-T is not carried out.	Not applicable. No such change to the law has occurred.

Table 3-1: Status of EnergyConnect contingent project trigger events

As the relevant trigger events have now occurred, this Application presents the required information for the AER to make a determination to approve the total incremental expenditure for the Project and to amend our current revenue determination, in accordance with clause 6A.8.2 of the Rules.



3.3 **Project Timing**

ElectraNet has undertaken a range of early works including route and site selection works for the Project, as well as environmental and social studies required for obtaining planning approvals. This has included extensive community engagement, including face-to-face landholder and stakeholder consultation about the proposed route and easement acquisition processes.

For the purpose of this Application, the applicable dates for commencement and completion of the Project are as follows:

- Date for commencement of the contingent project 1 July 2018
- Anticipated date for completing construction 31 December 2023

This is expected to be followed by a period of commissioning and inter-network testing.

We also continue to explore opportunities to deliver the Project earlier, if feasible.

This could bring forward the anticipated completion date above, and the timing of the capital expenditure and revenue required to deliver the Project.

Should this occur, ElectraNet will submit updated project and expenditure timing information to the AER to enable this to be taken into consideration during its assessment of this Application.

3.4 Pre-lodgement Consultation

The AER's Process Guideline for Contingent Project Applications under the Rules encourages transmission companies to engage with the AER prior to lodgement of a Contingent Project Application to assist both the AER and TNSP to satisfy the requirements of the Rules.

We undertook the pre-lodgement process prior to formal lodgement of this Application with the provision of a range of background and supporting information to the AER together with a draft copy of this Application.

We also provided a briefing to our Consumer Advisory Panel on the Application and invited feedback as part of this consultation.



4. Forecast Capital Expenditure

This chapter presents our forecast capital expenditure requirements for the SA component of the Project in accordance with clauses 6A.8.2(b)(2)-(4) of the NER. We note that TransGrid is lodging a separate Contingent Project Application in relation to the NSW component of the Project.

We are confident that our capital expenditure forecast is prudent and efficient, having regard to the capex objectives, criteria and factors specified in the NER¹⁷. The total forecast capital expenditure satisfies the contingent project expenditure threshold.

4.1 Basis for capital expenditure forecast

Table 4-1 below provides a summary breakdown of the cost components and the basis of the capital expenditure forecast for this Application. Market pricing makes up the majority of the capital costs (over 75%).

Capex Item	Cost estimate ¹⁸	Basis for Forecast Expenditure
Transmission line works	258.7	Market pricing from credible competing vendors.
Substation works	108.3	Market pricing from credible competing vendors.
Land access & approvals	21.3	Independent valuations of easement costs and forecast environmental and cultural heritage requirements.
Project delivery costs	33.7	Reflects current delivered costs and benchmarks based on detailed resource assessment.
Special Protection Scheme	18.9	Independent estimate of expected scope and cost of the scheme.
Inter-network testing	13.4	Estimate of testing costs and requirements developed with TransGrid and AEMO.
Project risk	16.3	Detailed probabilistic risk assessment (reflecting a P50 estimate).
Total	470.7	

Table 4-1: Breakdow	n of forecast	capital	expenditure	and k	oasis (\$n	n 2017-18)
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¹⁷ As required by clause 6A.8.1(b)(2)(ii) of the Rules.

Excluding prior period expenditure of \$3.3 million (\$2017-18). The total project cost for the SA component of \$474.0 million (\$2017-18) is equivalent to a cost of approximately \$483 million (\$2018-19) as applied in our updated cost benefit assessment.



4.1.1 Basis of capital expenditure estimates

The capital expenditure forecasts are based on competitive market pricing obtained from prospective vendors, current delivered costs and prevailing market rates. This information is drawn from a range of sources, including tender responses, market information, recently completed projects, purchased equipment and current labour and foreign exchange rates.

Estimated capital costs have also been revised to account for a range of other factors through the course of detailed project planning, including detailed assessment of project risks, required route refinements, environmental approval requirements, and more recently the impacts of COVID-19.

We are undertaking a comprehensive procurement process to deliver the Project at the lowest practicable cost, whilst ensuring that risk is appropriately managed in the delivery model. Further details of our procurement process are provided to the AER on a confidential basis.

A balanced approach will be applied to the tender assessment to ensure the core objectives of the Project are met, including safety, environmental protection and cultural heritage impacts, in addition to cost, quality, risk and delivery requirements.

Project delivery costs have been forecast based on current costs, consistent with benchmarks accepted by the AER in previous revenue determination processes and recent decisions¹⁹.

4.1.2 Basis of project risk estimates

An appropriate project risk allowance has been calculated based on the established project risk management methodology previously accepted by the AER.²⁰ This methodology involves a detailed evaluation and probabilistic assessment of known risks that reflect the stage of the Project in the delivery cycle and complexity of the works involved in a greenfield line project of this nature.

The steps taken in performing these risk assessments are outlined below:

• Project risks were identified through a process of expert internal review and assessment across the relevant project disciplines. A description of each risk is captured and documented within a risk register.

²⁰ Consistent with AER's Expenditure Forecast Assessment Guideline (2013) and the risk allowance methodology used in ElectraNet's approved <u>Main Grid System Strength Contingent Project Application</u> and recently approved Eyre Peninsula Reinforcement Contingent Project Application.



¹⁹ Most relevantly, the AER recently approved project delivery costs representing 8.9% of total project costs in its September 2020 <u>Contingent Project Decision on ElectraNet's Eyre Peninsula Reinforcement</u>, a greenfield line project of similar scale and complexity. Project delivery costs for Project EnergyConnect compare favourably at 7.2% of project costs.

- A risk assessment was undertaken to identify appropriate mitigation measures and quantify the cost impact of the residual risk. The detailed inputs to this risk assessment are determined with the relevant subject matter experts.
- Monte Carlo Analysis was performed to simulate project risk cost outcomes on a probabilistic basis, based on the likelihood of occurrence and range of potential cost impacts across each of the identified risks on a 50% probability of exceedance ('P50') basis through a large number of simulations.
- The outcomes of this risk assessment are used to establish the risk allowance component of the capital cost estimate.

Further details of our risk register and the associated allowance are provided to the AER on a confidential basis.

4.2 Capital Expenditure Forecast by Year

As required by clause 6A.8.2(b)(3) of the NER, our forecast incremental capital expenditure for the Project for each year of the regulatory control period is presented in Table 4-2 below.

Table 4-2: Capital expenditure forecast (\$m 2017-18)

	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	Project Total	Total 2018-19 to 2022-23
Capital expenditure ²¹	5.0	4.1	7.2	74.1	143.9	236.4	470.7	234.3

Total may not add due to rounding

The expenditure profile above reflects the delivery schedule for the Project based on construction by 31 December 2023.

4.3 RIT-T cost comparison

Table 4-3 below compares the capital expenditure forecast proposed in this Application with the estimated capital cost of the project modelled in the PACR.

Table 4-3: Forecast and PACR capex comparison (\$m 2017-18)

Forecast	PACR ²²	Updated estimate
SA component	374	474

Since publishing the PACR in February 2019, we have updated the capital cost estimates

- ²¹ Excluding prior period expenditure of \$3.3 million (\$2017-18).
- ²² Equivalent to a cost of \$380 million (\$2018-19) as detailed in the <u>South Australian Energy Transformation PACR</u>, February 2019, table 17, p210.



to reflect the market pricing outcomes of the competitive procurement and contracting process. Capital costs have also been revised to account for a range of other factors identified through the course of our detailed project planning, including assessment of project risks, line route diversions to avoid environmentally sensitive areas, inter-network testing requirements, additional substation works and environmental approval requirements.

This has resulted in a capital expenditure forecast that is approximately 27% higher than the estimate in the RIT-T. This is consistent with the assumptions of AEMO's 2020 ISP which assumes an increase of 30% in the costs of ISP projects compared with previous estimates based on prevailing transmission costs.

As explained in section 2.5, we have updated the cost benefit modelling with the latest information on project cost and timing and other key inputs. The updated modelling demonstrates that the preferred option identified in the PACR continues to deliver positive net market benefits and remains the top-ranked option.

4.4 Capital Expenditure Threshold

To qualify as a contingent project, the proposed capital expenditure at the time of ElectraNet's revenue determination was required to exceed either \$30 million or 5% of the Maximum Allowed Revenue (MAR) for the first year of the regulatory control period, whichever is the greater.²³

As the AER determined a maximum allowed revenue for ElectraNet for the first year of the current regulatory control period of \$305.3 million (smoothed), 5% of this total is approximately \$15.3 million. Therefore, the applicable threshold for a contingent project is \$30 million. As the estimated cost of the Project exceeds this figure, the threshold requirements of clause 6A.8.2(b)(4) of the Rules are satisfied.

4.5 CESS Capital Expenditure

The incremental capital expenditure above results in an increase in the ex-ante capital expenditure forecast for the purposes of the Capital Expenditure Sharing Scheme (CESS) in accordance with the requirements of the scheme.²⁴

The revised capital expenditure forecast to be used to calculate efficiency gains in the 2018-19 to 2022-23 regulatory control period is outlined in Table 4-4 below, compared with the existing target capex for the CESS.

²⁴ AER, <u>Better Regulation – Capital Expenditure Incentive Guideline for Electricity Network Service Providers</u>, Nov 2013, p.9.



²³ In accordance with clause 6A.8.1(b)(2)(iii).

	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Updated target capex for the CESS	117.2	214.2	184.8	320.2	241.1	1077.5
Existing target capex for the CESS ²⁵	111.8	210.0	177.5	245.2	95.5	840.0

Table 4-4: Forecast capex for the CESS (\$m Jun 2017-18)

Total may not add due to rounding

4.6 Conclusion

The total forecast capital expenditure for the purpose of this Application is \$470.7 million²⁶ (\$2017-18) for the SA component of the Project.

We are confident that this forecast is both efficient and prudent (in accordance with the capital expenditure criteria) and that it meets the required capital expenditure objectives set out in the Rules.

²⁵ As adjusted by the AER's recent decision for the Eyre Peninsula Reinforcement Contingent Project Application.

²⁶ Excluding prior period expenditure of approximately \$3.3 million already included in the RAB.



5. Forecast Incremental Operating Expenditure

This chapter presents the forecast incremental operating expenditure requirements for the Project, in accordance with the requirements of clause 6A.8.2(b)(3) of the Rules.

Whilst the Project will lead to higher maintenance expenditure once commissioned, the timing of the Project is such that the incremental costs associated with maintenance are not expected to occur until the next regulatory control period. Nevertheless, we do expect to incur some minor incremental operating expenditure in advance of the commissioning date, as explained below.

We are confident that our incremental operating expenditure forecast is prudent and efficient and satisfies the operating expenditure criteria and operating expenditure factors set out in the Rules.

5.1 Basis for operating expenditure forecast

We have determined the incremental operating expenditure for the Project in a manner consistent with the methodology and models accepted by the AER in its revenue determination for ElectraNet for the current regulatory control period.

The operating expenditure forecast for the Project comprises:

- A minor increase in land tax;
- An additional specialist system and protection engineering resource (1 FTE); and
- A minor increase in debt raising costs, based on benchmark costs calculated using the AER's PTRM.

The increased complexity of the power system is requiring more complex special protection schemes to ensure the resilience of the power system, and the introduction of a new interconnector will result in a fundamental change to the transmission system. Whereas currently SA is at the end of a mostly linear NEM transmission system, the Project will have the effect of 'meshing' SA with the NEM by creating two alternating current connections – one via the Heywood interconnector to Victoria and the other via Project EnergyConnect to NSW.

Regular functional review of all special protection schemes is required, and this effort will increase significantly with the introduction of Project EnergyConnect to the network. The need for an additional specialist engineering resource reflects the ongoing resource commitment required for regular functional review of all special protection schemes to manage the additional system and operational complexities associated with the Project.

As a minimum, the following schemes will have to be redesigned since the introduction of Project EnergyConnect has a fundamental impact on their operation:

- Under Frequency Load Shedding
- Over Frequency Generation Shedding



- System Integrity Protection Scheme
- Other schemes that may be impacted (e.g. generator runback schemes)

The increased rate of change in the power system makes this an ongoing requirement. It is also expected that future Power System Frequency Risk Reviews by AEMO will uncover the requirement for more special protection schemes to be implemented, either via the declaration of Protected Events, or additional emergency frequency control schemes, adding to this requirement.

5.2 Incremental Operating Expenditure Forecast

The incremental annual operating expenditure forecast for the Project is as follows:

Component	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Controllable operating expenditure	0.0	0.0	0.0	0.1	0.2	0.3
Debt raising costs	0.0	0.0	0.0	0.0	0.1	0.1
Incremental operating expenditure	0.0	0.0	0.0	0.1	0.3	0.4

 Table 5-1: Incremental operating expenditure (\$m 2017-18)

5.3 EBSS Operating Expenditure

The incremental operating expenditure above results in a minor adjustment to the operating expenditure forecast for the purposes of the Efficiency Benefit Sharing Scheme (EBSS) in accordance with the requirements of the scheme.²⁷

The revised operating expenditure forecasts to be used to calculate efficiency gains in the 2018-19 to 2022-23 regulatory control period are shown in Table 5-2 below, compared with the existing target operating expenditure for the EBSS.

²⁷ AER, <u>Better Regulation – Efficiency Benefit Sharing Scheme for Electricity Network Service Providers</u>, November 2013, p.9.



Component	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Updated opex allowance	90.4	90.9	92.5	93.7	93.0	460.4
Less debt raising costs	(1.3)	(1.3)	(1.3)	(1.4)	(1.5)	(6.7)
Less network support costs	(8.4)	(8.4)	(8.4)	(8.4)	(7.0)	(40.5)
Updated target opex for the EBSS	80.7	81.2	82.8	84.0	84.5	413.3
Existing target opex for the EBSS ²⁸	80.7	81.2	82.8	83.8	84.3	412.9

Table 5-2: Forecast operating expenditure for the EBSS (\$m Jun 2017-18)

Totals may not add due to rounding

5.4 Conclusion

The incremental impact on operating expenditure for the Project in the remaining years of the regulatory control period is \$0.4 million (\$2017-18).

We are confident that our forecast operating expenditure is both efficient and prudent (in accordance with the operating expenditure criteria) and that it meets the operating expenditure objectives specified in the Rules.

²⁸ As adjusted by the AER's recent decision for the Eyre Peninsula Reinforcement Contingent Project Application.



6. Incremental Revenue Requirements

This chapter presents an estimate of the incremental revenue likely to be required for each remaining regulatory year of the regulatory control period as a result of the Project, in accordance with the requirements of Clause 6A.8.2(b)(7) of the Rules.

Our proposed incremental revenue is consistent with the incremental capital and operating expenditure as presented in Chapters 4 and 5 above.

We have modelled the required incremental revenue on a nominal basis using the AER's PTRM for the current period (which is updated annually by the AER for the trailing average cost of debt) as most recently updated for the approved revenue associated with the Eyre Peninsula Reinforcement Contingent Project²⁹. A copy of the PTRM accompanies this Application.

The capital expenditure forecast has been classified in a manner consistent with the AER's roll forward model to allow for the calculation of the Regulated Asset Base at the close of the current regulatory control period in accordance with clause 6A.8.2(b)(7)(ii) of the Rules.

6.1 WACC

Clause 6A.8.2(b)(7)(iii) of the Rules states that the incremental revenue requirements must reflect the prevailing rate of return determined by the AER for the current regulatory control period. The WACC parameters set out in Table 6-1 below, which we have applied in this Application, satisfy this Rule requirement.

Table 6-1: WACC Parameters³⁰

Parameter	AER Approved Value
Risk-free rate	2.87%
Forecast inflation	2.45%
Market risk premium	6.50%
Gearing	60.0%
Equity beta	0.7
Nominal pre-tax return on debt	4.35%
Nominal post-tax return on equity	7.40%
Nominal vanilla WACC	5.57%

²⁹ The most recently approved PTRM was published by the AER in its decision on the <u>Eyre Peninsula</u> <u>Reinforcement Contingent Project Application</u>.

³⁰ As last updated by the AER in March 2020 in its annual trailing average cost of debt update.



6.2 Depreciation

Clause 6A.8.2(b)(7)(iv) of the Rules requires that the calculation of the estimated incremental revenue be consistent with the way depreciation is calculated under clause 6A.6.3. The incremental annual regulatory depreciation shown in Table 6-2 below has been calculated using the PTRM.

Component	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Approved regulatory depreciation	44.2	63.5	65.1	73.8	65.7	312.4
Project EnergyConnect incremental regulatory depreciation	0.0	0.3	-0.2	-0.4	-2.5	-2.9
Revised regulatory Depreciation	44.2	63.7	64.9	73.4	63.2	309.5

Table 6-2: Incremental Regulatory Depreciation (\$m nominal)

Totals may not add due to rounding

The updated total regulatory depreciation forecast for the 2018-19 to 2022-23 regulatory control period will be applied in calculating our opening RAB at the commencement of the following regulatory control period, consistent with the forecast depreciation approach approved by the AER in the current revenue determination.³¹

6.3 Tax allowance

The incremental annual net tax allowance shown in Table 6-3 below has been calculated using the PTRM.

Component	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Approved tax allowance	4.9	7.5	8.4	9.9	10.1	40.7
Project EnergyConnect incremental tax allowance	0.0	0.0	0.0	0.0	0.1	0.2
Revised Tax Allowance	4.9	7.5	8.4	9.9	10.2	40.8

Table 6-3: Incremental Tax Allowance (\$m nominal)

Totals may not add due to rounding

³¹ AER, <u>ElectraNet transmission determination 2018 to 2023</u>, April 2018, p13.



6.4 Incremental revenue requirements for each year to end of period

Based on the estimates provided above and using the PTRM, we have calculated our incremental annual building block revenue requirements for the Project as shown in Table 6-4.

Component	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Return on capital	0.0	0.3	0.5	1.0	5.7	7.6
Regulatory depreciation	0.0	0.3	-0.2	-0.4	-2.5	-2.9
Operating expenditure	0.0	0.0	0.0	0.1	0.3	0.5
Revenue Adjustments	0.0	0.0	0.0	0.0	0.0	0.0
Net tax allowance	0.0	0.0	0.0	0.0	0.1	0.2
Unsmoothed revenue requirement	0.0	0.6	0.3	0.7	3.6	5.3

Table 6-4: Incremental Revenue Requirement (\$m nominal)

Totals may not add due to rounding

6.5 Amended maximum allowed revenue

The AER's final decision on the annual building block revenue requirement for the current regulatory control period is set out in Table 6-5 (as revised annually by the AER for the annual trailing average cost of debt update³²) together with the calculation of the amended MAR required for the Project.

Table 6-5: Amended annual building block revenue requirement (\$m nominal)

Component	2018-19	2019-20	2020-21	2021-22	2022-23	Total
AER annual building block revenue requirement	286.1	314.5	327.0	349.5	354.6	1,631.7
Project EnergyConnect revenue requirement	0.0	0.6	0.3	0.7	3.6	5.3
Amended annual revenue requirement (unsmoothed)	286.1	315.2	327.3	350.2	358.2	1,637.0

Totals may not add due to rounding

The recovery of the incremental revenue approved by the AER will commence in the 2021-22 regulatory year, in accordance with ElectraNet's approved Transmission Pricing Methodology.

³² As updated for the incremental revenue approved for the Eyre Peninsula Reinforcement Contingent Project.



Table 6-6 below sets out the updated MAR and X factors for the current regulatory control period.

Component	2018-19	2019-20	2020-21	2021-22	2022-23	Total
MAR (smoothed)	305.3	312.5	322.3	338.5	355.4	1,634.0
X Factor	14.85%	0.08%	-0.67%	-2.49%	-2.49%	

Table 6-6: Amended maximum allowed revenue (\$m nominal)

Totals may not add due to rounding

The incremental revenue requirement has been smoothed in order to minimise impacts on customer prices over time, in a manner consistent with the requirements of the Rules that:

- Provides an equivalent revenue outcome in net present value terms; and
- Ensures the revenue to be recovered in the last year of the regulatory control period is as close as reasonably possible to the unsmoothed revenue requirement.³³

Under the approach above, the smoothed incremental revenue requirement does not commence until 2021-22, aligning with the first year in which revenue recovery can commence under the annual transmission pricing process.³⁴

³³ In accordance with clause 6A.6.8(c).

³⁴ Noting that transmission prices have already been published under the Rules for 2020-21.



6.6 Customer bill impact

Updated modelling based on the latest cost estimates prepared for this Application confirms that the preferred option identified in the PACR continues to have positive net market benefits and remains the top-ranked option using updated inputs aligned with AEMO's 2020 ISP.

ElectraNet also engaged ACIL Allen to undertake independent market modelling to estimate the customer bill impacts of Project EnergyConnect. ACIL Allen's modelling indicates that the Project will significantly reduce customers' bills in SA, as the increase in network costs to fund the Project are offset more than tenfold by reduced wholesale energy prices.

Their analysis shows an expected net average reduction of \$100 per annum per residential customer in SA, comprising:

- An increase in network costs of approximately \$10 per annum per customer; and
- A reduction in wholesale energy prices of \$110 per annum per customer.

Their analysis also shows a corresponding reduction of over \$200 per annum per small business customer in SA, comprising:

- An increase in network costs of approximately \$20 per annum per customer; and
- A reduction in wholesale energy prices of \$221 per annum per customer.

A copy of the independent Price Impact Report from ACIL Allen accompanies this application.



APPENDICES

Appendix A Requirements Checklist

The purpose of this table is to demonstrate compliance with the contingent project application information requirements specified in clause 6A.8.2(b) of the Rules.

Rul	e 6A.8.2(b) requirements	Reference in Application
(1)	an explanation that substantiates the occurrence of the <i>trigger</i> event,	Section 3.2 and Appendix B
(2)	a forecast of the total capital expenditure for the contingent project;	Section 4.2
(3)	a forecast of the capital and incremental operating expenditure, for each remaining <i>regulatory year</i> which the <i>Transmission Network</i> <i>Service Provider</i> considers is reasonably required for the purpose of undertaking the <i>contingent project</i> ;	Sections 4.2 and 5.3
(4)	how the forecast of the total capital expenditure for the <i>contingent project</i> meets the threshold as referred to in clause 6A.8.1(b)(2)(iii);	Section 4.4
(5)	the intended date for commencing the <i>contingent project</i> (which must be during the <i>regulatory control period</i>);	Section 3.3
(6)	the anticipated date for completing the <i>contingent project</i> (which may be after the end of the <i>regulatory control period</i>); and	Section 3.3
(7)	an estimate of the incremental revenue which the <i>Transmission</i> <i>Network Service Provider</i> considers is likely to be required to be earned in each remaining <i>regulatory year</i> of the <i>regulatory control</i> <i>period</i> as a result of the <i>contingent project</i> being undertaken as described in subparagraph (3), which must be calculated:	Section 6.4 and 6.5
	 (i) in accordance with the requirements of the <i>post-tax revenue</i> model referred to in clause 6A.5.2; 	
	 (ii) in accordance with the requirements of the <i>roll forward model</i> referred to in clause 6A.6.1(b); 	
	(iii) using the <i>allowed rate of return</i> for that <i>Transmission Network</i> <i>Service Provider</i> for the <i>regulatory control period</i> as determined in accordance with clause 6A.6.2;	
	(iv) in accordance with the requirements for depreciation referred to in clause 6A.6.3; and	
	 (v) on the basis of the capital expenditure and incremental operating expenditure referred to in subparagraph (b)(3). 	



Appendix B Board Approval



I certify that the following is an extract from the minutes of a duly authorised resolution of the Board of Directors of ElectraNet Pty Ltd ABN 41 094 482 416 dated **29 September 2020**.

Subject: Regulated Contingent Project Approval Update – Project EC.14171 – Project Energy Connect

The Board <u>RESOLVED</u> to commit to proceed with the South Australian section of Project EnergyConnect, subject to the AER awarding incremental regulated revenue commensurate with the capital and operating costs for ElectraNet's section of the Project, ElectraNet obtaining funding, as necessary and on terms satisfactory to it, and the Board of TransGrid making a firm commitment to proceed with the NSW component of the Project, following the AER's determination on its corresponding application.

COMPANY SECRETARY

DATE: 29 September 2020



