EMCa

energy market consulting associates

ElectraNet's Eyre Peninsula Reinforcement Project

ASSESSMENT OF ASPECTS OF THE PROPOSED CAPITAL COSTS

Report prepared for:

AUSTRALIAN ENERGY REGULATOR

September 2020

Disclaimer

This report has been prepared to assist the Australian Energy Regulator (AER) with its determination of ElectraNet's Contingent Project Application for the Eyre Peninsula Reinforcement project. The AER's determination is conducted in accordance with its responsibilities under the National Electricity Rules (NER). This report covers a particular and limited scope as defined by the AER and should not be read as a comprehensive assessment of proposed expenditure that has been conducted making use of all available assessment methods.

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Date saved
15/09/2020 7:30 PM

Version
Final v1

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ABBREVIATIONS

Term	Definition
AER	Australian Energy Regulator
BAFO	Best and Final Offer
ECI	Early Contractor Involvement
EPRP	Eyre Peninsula Reinforcement Project
D&C	Design and construct
NEM	National Electricity Market
PACR	Project Assessment Conclusions Report
RIT-T	Regulatory Investment Test – Transmission

EXECUTIVE SUMMARY

Project overview

1. ElectraNet submitted a Contingent Project Application to the AER in May 2020 following the AER's determination in April 2019 that the Eyre Peninsula Reinforcement Project (EPRP) satisfied the requirements of the Regulatory Investment Test for Transmission (RIT-T).
2. The main purpose of the EPRP is to improve the reliability and capacity of supply to the West Coast of South Australia and comprises:
   - a new 275kV double-circuit transmission line from Cultana to Yadnarie initially to be energised at 132kV;
   - a new 132kV double-circuit transmission line from Yadnarie to Port Lincoln; and
   - modifications to Cultana, Middleback, Wudinna, Yadnarie, and Port Lincoln substations.

Project scope

EMCa has been asked by the AER to consider the reasonableness of aspects of the project cost estimate

3. EMCa has reviewed three aspects of the capital cost for the AER to support its determination of the prudency and efficiency of the estimated project cost of $317m ($nominal):
   - the transmission lines cost as determined by competitive tender;
   - the reasonableness of the Project Delivery Costs to be incurred by ElectraNet; and
   - the reasonableness of ElectraNet's Risk Allowance.

Our assessment

ElectraNet's proposed delivery model is appropriate

4. ElectraNet considered four options for the commercial model, also referred to by ElectraNet as its delivery model, and selected and is applying a Design and Construction (D&C) approach with a single Contractor, incorporating a fixed price established through competitive tender to deliver the prescribed works. The path to final award of the D&C contract includes a fixed price Early Contractor Involvement (ECI) stage to undertake early design activities and to allocate remaining project risks.
5. Based on the information provided, we consider that the selected delivery model is a reasonable approach that supports clarity of the scope of work and the opportunity to agree an efficient allocation of risk between the two parties.

A technically acceptable, competitive cost has been established from ElectraNet's tender process

6. Approximately 75% of the proposed cost of the EPRP is associated with designing, constructing and commissioning the new transmission lines. The costs for the transmission lines and substation modifications have been established by a competitive tender process run by ElectraNet.
7. From this process, ElectraNet has selected the proponent with the lowest price and the highest non-price 'score' and has entered into the ECI stage with the preferred Contractor. It

has retained the runner-up in the process in case the ECI phase is not successfully concluded with the preferred Contractor.

8. We have reviewed the tender process and whilst we consider it may not have fully explored all opportunities for applying least cost design and construction techniques, a technically acceptable, competitive cost has been established in accordance with the Specification. The Contractor is a large, experienced firm operating in the electricity industry and it is reasonable to conclude that it has the capacity and capability to deliver the project scope within the nominated schedule.

A lower final transmission line cost may have been achieved with more exploration of alternative transmission line structure designs and construction techniques

9. Whilst we consider that the starting price for the ECI phase submitted by the preferred Contractor has been competitively obtained, we also are of the view that there may not have been sufficiently rigorous assessment of alternative transmission structure designs and construction techniques prior to publishing the Request for Tender. Furthermore, the narrow technical envelope which the Specification sets has contributed to only relatively small cost efficiency measures to be introduced throughout the procurement process to date. We consider that there is now limited opportunity in the remainder of the process for ElectraNet to achieve materially lower transmission and substation costs (at an acceptable level of risk) throughout the remainder of the project.

10. We do not propose any adjustment to the Best and Final Offer (BAFO) price proposed by the preferred tenderer on this basis, as we are not certain that alternative transmission line design and construction techniques would actually result in a lower final cost.

ElectraNet's estimated Project Delivery Cost appears to be overstated

11. ElectraNet has estimated $21.0m ($nominal) for its project management and other internal labour costs to manage project delivery through the ECI and D&C stages. We have reviewed ElectraNet's project team structure (including the nominated number of FTEs for each stage) and the project team's responsibilities.

12. Based on the information provided, we undertook a bottom-up cost analysis and consider that the Project Delivery Cost is overstated by between 25%-35%. The basis for our assessment is primarily what we consider to be excessive unit costs (i.e. salaries plus on-costs) and, secondly (and much less significantly), an overstatement of the number of FTEs likely to be reasonably required.

13. We also reviewed information provided to us by ElectraNet subsequent to our initial assessment. The new information did not change our conclusion.

ElectraNet's estimated Risk Allowance appears to be overstated

14. ElectraNet proposed a $19.5m ($nominal) Risk Allowance which it determined through a probabilistic assessment of the monetised risks, and which was based on its engineering judgment. We have reviewed the 62 risk items in ElectraNet's risk register and we consider that the risk allowance is overstated by up to 29%. This is due to one of more of the following:

- the consequence cost is overstated;
- the likelihood of the event occurring is overstated;
- duplication or overlap of risks; and
- risk should reasonably be borne by the Contractor.

2 INTRODUCTION

2.1 Scope

15. ElectraNet submitted a Contingent Project Application for the Eyre Peninsula Reinforcement Project (EPRP) to the Australian Energy Regulator (AER) in May 2020. The AER has requested EMCa to provide advice and assistance in determining:

- whether the proposed costs represent a reasonable forecast of the capex and incremental opex required for undertaking the contingent project, both overall and in each year remaining in the regulatory control period;
- a substitute forecast, in the event that the proposed costs do not represent a reasonable forecast; and
- whether the information provided in the Contingent Project Application is sufficient to make the above determination/s, and if not, what additional information the AER should request from ElectraNet.

16. By agreement with the AER, we focussed on three areas of the cost forecast:

1. the transmission lines and substation cost, as determined by competitive tender;
2. the reasonableness of the Project Delivery Costs to be incurred by ElectraNet; and
3. the reasonableness of ElectraNet's Risk Allowance.

17. The purpose of this report is to provide AER with our assessment of the aspects of expenditure set out above, and the basis for our findings.

2.2 Structure of this report

18. In section 3 we provide an overview of the EPRP and the expenditure that we have been asked to assess. In the subsequent sections, we provide our assessment of the three areas of scope:

- In section 4, we provide our assessment of ElectraNet's procurement process and commercial arrangements used to achieve what it claims to be efficient price from an external service provider for the transmission line and substation works;
- In section 5, we provide our assessment of ElectraNet's proposed Project Delivery Cost; and
- In section 6, we provide our assessment of ElectraNet's proposed Risk Allowance.

2.3 Presentation of expenditure amounts

19. Expenditure is presented in this report in nominal dollar terms, unless stated otherwise.

2.4 ElectraNet provided information to inform our review

20. ElectraNet 's EPRP Contingent Project Application was submitted in May 2020. In addition to its Application documentation, ElectraNet provided additional information and data which we have drawn from for our review of aspects of the project cost estimate. The information included:

- several Excel workbooks containing costs estimates, inputs, risk quantification, economic assessments etc.;

- a basis of estimate report;
- a procurement summary;
- scope of the proposed works;
- economic assessment; and
- the project risk register.

2.4.1 Information requests

21. In addition to the above, the AER and ourselves sought further information from ElectraNet through written information requests. ElectraNet provided responses to each of the information requests and we took relevant information into account in our assessment.

2.4.2 Initial workshop with ElectraNet

22. We held a virtual meeting with ElectraNet to discuss specific issues that we considered had not been adequately covered in the information and documentation provided. ElectraNet engaged positively in these discussions and provided additional material that we requested to support the explanations given at the meeting.

2.4.3 Follow-up information exchange and discussion with ElectraNet

23. Following EMCa's initial assessment of the information provided by ElectraNet (including in response to information requests) and the discussion at the workshop with ElectraNet, the following sequence of further information exchange occurred:
    - the AER provided to ElectraNet, EMCa's spreadsheet underpinning our assessment of the reasonableness of ElectraNet's Risk Allowance for review and comment;
    - ElectraNet provided a revised Risk Allowance spreadsheet to the AER and EMCa, with updated information;
    - ElectraNet, AER, and EMCa held a virtual meeting to provide ElectraNet with the opportunity to help ensure that AER/EMCa representatives understood ElectraNet's revised positions;
    - AER provided a written summary of the approach EMCa undertook to assess ElectraNet's Project Delivery Cost and verbally communicated the result of EMCa's assessment; and
    - ElectraNet responded via a letter to the AER and also provided a confidential spreadsheet comprising, among other things, the labour unit costs it had applied in deriving its Project Delivery Costs (overheads).
24. EMCa took into account the subsequent information provided by ElectraNet in finalising this report.

3 BACKGROUND INFORMATION

In this section we provide an overview of the Eyre Peninsula Reinforcement Project, including the proposed capital expenditure included in ElectraNet's Contingent Project Application.

3.1 Introduction

26. The purpose of the EPRP is to improve the reliability of supply to the West Coast of South Australia and provide for the electricity supply needs of the future.

27. ElectraNet submitted a Contingent Project Application for the EPRP to the AER for its consideration and approval. This follows the AER's determination in April 2019 that the EPRP satisfied the requirements of the Regulatory Investment Test for Transmission (RIT-T). When making its determination, the AER was not required to consider whether the estimated capital costs of the identified preferred option represented efficient and prudent costs that reasonably reflect the capital expenditure criteria.

28. Having received a Contingent Project Application for the EPRP from ElectraNet, the AER is now required to consider if the proposed capital expenditure represents prudent and efficient costs.

3.2 EPRP overview

3.2.1 Project drivers

29. ElectraNet has identified the following project drivers for the EPRP:[1]

- to ensure future reliability performance – e.g. through replacement of aging overhead lines and substation equipment;
- to avoid the costs of continuing the network support arrangement at Port Lincoln;
- to enable future connection of renewable energy resources – e.g. wind generation; and
- to improve energy transfer capabilities – e.g. from the Eyre Peninsula to the NEM.

30. In developing the project scope and initial design ElectraNet advises that it has also taken into account 'the requirement to replace major transmission line components serving the lower Eyre Peninsula in the next few years and the scheduled expiry of the network support arrangement at Port Lincoln.'[2]

3.2.2 Project scope of works

31. In high level terms, the EPRP comprises:[3]

- a new 275kV double-circuit transmission line from Cultana to Yadnarie to be initially energised at 132kV;
- a new 132kV double-circuit transmission line from Yadnarie to Port Lincoln; and
- modifications to Cultana, Middleback, Wudinna, Yadnarie, and Port Lincoln substations.

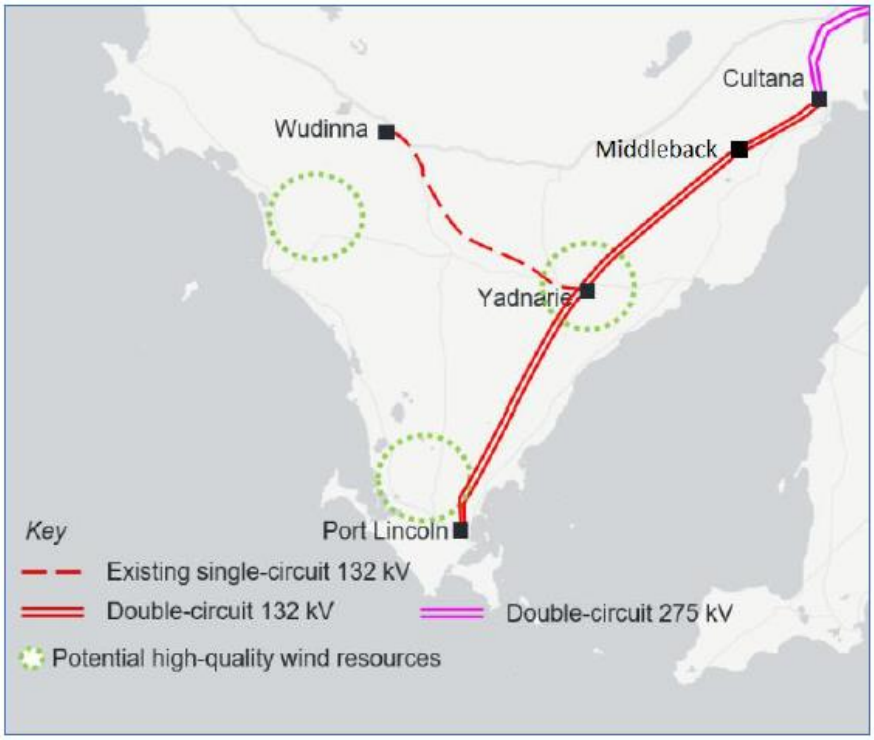
32. The figure below shows the primary components of the project.

[1] ElectraNet, Eyre Peninsula Contingent Project Application-PUBLIC-May2020, section 2.3.3

[2] ElectraNet, Eyre Peninsula Contingent Project_Application-PUBLIC-May2020, section 2.3.1

[3] ElectraNet, Basis of Estimate Report: CONFIDENTIAL, page 7

Figure 3.1: Network configuration of the Eyre Peninsula Reinforcement Project



Source: ElectraNet, Eyre Peninsula Reinforcement Contingent Project Application, Figure 1, page 8

3.2.3 Project Timing

33. ElectraNet's Contingent Project Application includes the following project timing:

- commencement of the EPRP – 1 July 2018.
- anticipated date for completing the EPRP – 31 December 2022.

34. The impact of COVID-19 has resulted in a six-month delay to the initially-scheduled project delivery date from mid-2022 to December 2022. Costs associated with the delay are included in the project cost estimate.

35. Realisation of the full estimated net market benefits from the EPRP is dependent on the completion of the new SA-NSW interconnector.

3.3 Forecast Capital Expenditure

36. The forecast capex for the EPRP is $290m (real 2017-18, and not including capital costs incurred[4]). This is an increase of $53m from the Project Assessment Conclusions Report (PACR) reflecting '*market pricing outcomes of the competitive procurement and contracting process…*' and '*to account for a range of other factors identified through the course of detailed project planning, including detailed assessment of project risks, additional access track requirements, environmental approval requirements, and more recently the impacts of COVID-19.*'[5]

37. The table below summarises the major components of the updated EPRP cost estimate, The equivalent amount in nominal dollars is $317.6m (including prior period expenditure incurred).

[4] Prior period expenditure of approximately $3.1m comprises (i) $1.9m ($2017-18) in 2011-12 and 2012-13 relating to earlier RIT-T consultation, and (ii) expenditure of approx. $1.2m ($2017-18) in 2016-17 and 2017-18 relating to the RIT-T assessment described in section 2.1. It is excluded from the incremental revenue sought in this application ElectraNet Contingent Project Application, footnote 13, page 16)

[5] ElectraNet, Eyre Peninsula Contingent Project_Application-PUBLIC-May2020, section 4.3

Table 3.1: ElectraNet's Contingent Project Application - forecast capex and basis - $m

Capex item	Cost estimate without prior period expenditure $2017-18	Cost estimate with prior period expenditure $2017-18	Cost estimate with prior period expenditure $nominal
Transmission line works	217.0	219.2	237.6
Substation works	17.0	16.9	18.3
Land access & approvals	9.0	8.8	9.5
Project delivery costs	30.0	30.1	32.7
Project risk	18.0	18.0	19.5
Total	**290**	**293.0**	**317.6**

Source: ElectraNet, Contingent Project Application, Table 4-1; Attachment 4 – Reconciliation of summary cost breakdown_ CONFIDENTIAL; Attachment 5 - Capital Cost Inputs File_CONFIDENTIAL_26Jun2020

4 TRANSMISSION LINES AND SUBSTATIONS

We have reviewed ElectraNet's procurement process used to derive the costs for the transmission line and the substation works that are largely to be delivered by ElectraNet's preferred contractor (Contractor) under its project delivery model.

We consider that the tender evaluation process followed good industry practice in allowing a fair comparison of price and non-price elements pertaining to the responses of two experienced and capable short-listed tenderers. The preferred tender for the transmission line and substation-related work was superior overall to that from the other short-listed tenderer on both price and non-price dimensions.

ElectraNet's selected delivery model appears to satisfy ElectraNet's project objectives better than the alternatives considered. The five stage approach to signing a D&C contract with the Contractor offers the potential to deliver the transmission line and substation components of the EPRP at a reasonable cost with an acceptable balance of risk between ElectraNet and the Contractor.

Whilst we identified several aspects of ElectraNet's tender process that in our opinion were not ideal, we consider that they have not detracted materially from achieving a competitive outcome for the line and substation activities to be undertaken by the Contractor.

ElectraNet itself explored alternative line designs and construction technologies prior to finalising the Tender Specification. However, we consider that ElectraNet's procurement process could have afforded further opportunity for innovative line design and construction methodologies to be explored to reduce the overall delivered cost. We identify this as an improvement opportunity for consideration in subsequent tender processes, not as a conclusion that a lower, technically and commercially prudent price would have been achieved in the case of the EPRP.

4.1 Introduction

4.1.1 ElectraNet's process to establish the transmission line and substations cost estimate

38. ElectraNet's delivery model (also referred to as its 'commercial model') encompasses transmission line and substation design and construction (D&C) to be delivered by a single Contractor. The commercial agreement is split into two stages:[6]

- Early Contractor Involvement (ECI) – '*a fixed lump sum ECI contract…to undertake early design activities and allocate remaining project risks'*; and
- Design & Construct (D&C) – assuming successful completion of the ECI phase, ElectraNet will '*enter into a fixed price D&C contract in October 2020 to deliver the full lines and substation scope of works*.'

[6] ElectraNet-Eyre Peninsula Contingent Project - Procurement Summary_CONFIDENTIAL-May2020, page 4

39. In this section we consider ElectraNet's procurement process to establish an efficient transmission line and substations delivery cost from the Contractor, including:

- the appropriateness of the project objectives and selected delivery model;
- the tender process, including selection of the Contractor;
- the approach to establish efficient costs in the ECI and D&C stages, including the opportunities for prudent cost savings and who retains the savings;
- contract and project risk management; and
- the appropriateness of the components of the lines and substations fixed cost, including allowances and how variations will be managed.

4.2 ElectraNet's procurement process

4.2.1 Overview of the procurement process

Procurement objectives

40. ElectraNet established a Buying Team to manage the procurement process and the supporting commercial arrangements. The EPRP objectives are reproduced below.[7]

[7] ElectraNet-Eyre Peninsula Contingent Project - Procurement Summary_CONFIDENTIAL-May2020, pages 1-2

EPRP procurement objectives

1. *Lowest delivery cost at an acceptable level of risk.*
2. *A robust and effective risk management strategy that provides price certainty to ElectraNet.*
3. *Ensure the outcomes of the Project meet the technical and functional requirements of the Project Brief.*
4. *Ensure capable and experienced resources are available for key functions including line design, site management, health, safety and environment management, stringing and erection crews and site plant.*
5. *The Project is delivered safely for all stakeholders including contractors, subcontractors, equipment suppliers, ElectraNet staff and the general public.*
6. *Adherence to cultural heritage, landowner and native vegetation site access requirements.*
7. *Meet the Project schedule requirements to ensure:*
   - *a) Generation support costs are mitigated;*
   - *b) Construction outages are minimised;*
   - *c) Network failure risk is mitigated by early as possible energisation;*
   - *d) Resources are not constrained due to concurrent impact of other major projects;*
   - *e) Deliver the Project with the least cost impact by avoiding potential for stand-down costs; and*
   - *f) Escalation, risk and contingency costs are mitigated.*
8. *Ensure the use of local Eyre Peninsula resources where possible and appropriate.*

Selection of the project delivery model

41. ElectraNet assessed the following project delivery models in the 3rd quarter of 2019:[8]
    - multiple contract parties associated with a segmented delivery model;
    - semi-combined contracting model;
    - single D&C partner incorporating a total outturn cost (TOC) commercial model; and
    - single D&C partner with a competitive fixed price contract.
42. ElectraNet selected and is applying the single D&C partner delivery model incorporating a fixed price established through competitive tender.

ElectraNet's procurement steps

43. The process steps ElectraNet undertook to establish the D&C contract were:[9]
    - select two contractors from an initial market assessment of contractors for substation, line and civil works;

[8] ElectraNet-Eyre Peninsula Contingent Project - Procurement Summary_CONFIDENTIAL-May2020, page 2

[9] ElectraNet-Eyre Peninsula Contingent Project - Procurement Summary_CONFIDENTIAL-May2020, page 3-4

- issue RFT documents to the short-listed proponents on 24 December 2019 requiring complying offers by 10 January 2020;
- issue updated Specification and associated technical documentation to the tenderers in early February 2020 requiring final offers by 21 February 2020;
- technical and commercial assessment of the tenders, following a pre-determined procurement approach;
- site visits and negotiations with tenderers to clarify and finalise technical, schedule, commercial and legal terms; and
- tender assessment conducted against pre-agreed selection criteria.

44. From the short-listed contractors, the preferred contractor (Contractor) was recommended by the Buying Team because:[10]

- it presented the lower tender cost;
- it received the superior assessment after applying the evaluation criteria; and
- the Terms and Conditions of contract for the ECI and negotiations of the D&C contracts were acceptable to ElectraNet.

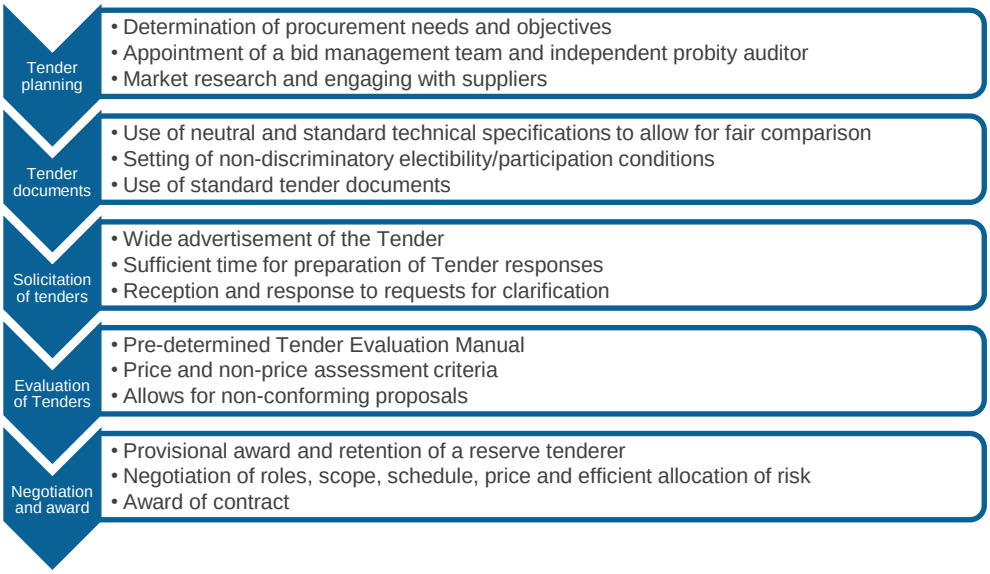
45. The other shortlisted tenderer has been retained as a credible alternative in case the ECI process fails with the Contractor.

4.2.2 Our assessment

Features of a competitive tender we looked for

46. In assessing the competitiveness of the tender and the likelihood that the tendered price is likely to be competitive we applied the framework in the figure below.

Figure 4.1: EMCa's competitive tender assessment framework



Source: EMCa, with reference to Government of South Australia, State Procurement Board, Acquisition Planning Policy version 10.8

Tender Planning

ElectraNet's procurement objectives are appropriate

47. We consider that ElectraNet's procurement objectives provide an appropriate balance of risk and cost elements to achieve a fit-for-purpose solution.

[10] ElectraNet-Eyre Peninsula Contingent Project - Procurement Summary_CONFIDENTIAL-May2020, page 6

48. A question we will explore in subsequent sections is whether ElectraNet's procurement process appropriately balanced the cost and risk-related objectives.

ElectraNet created a Buying Team but is silent regarding appointment of a probity auditor

49. In addition to a bid management team, we would expect for a project of this size and importance that ElectraNet would have appointed an independent probity auditor for the duration of the project through to award of contract.

50. ElectraNet's procurement summary document does not refer to a probity auditor. This does not mean that a probity auditor was not appointed. However, whilst absence of a probity auditor does not necessarily undermine achievement of a competitive price and other terms and conditions, it would not be consistent with good practice.

ElectraNet's choice of the fixed-price D&C delivery model is likely to be appropriate

51. In response to the AER's request for more information about the process ElectraNet followed to select the Contractor, ElectraNet advised that it applied the following criteria to both determine the preferred delivery model and to select short-listed prospective contractors:[11]

- '*presentations by contractors with resourced programs, safety statistics, previous projects, workforce planning and indicative delivery plans to determine corporate capability and capacity;*
- *site visits to review and inspect site management procedures, work practices, workmanship and site management capability;*
- *review of pricing and cost structures in building up packaged costs;*
- *risk analysis to identify potential interface risk between contractors;*
- *indicative costing developed by contractors to assist in the determination of the optimal delivery strategy;*
- *scenario analysis of the cost impact of selected delivery options; and*
- *ElectraNet's previous experience working with these contractors and potential for leveraging established relationships...*'

52. The only other information ElectraNet provided to explain its selection of its preferred delivery model was a list of benefits, which we summarise as follows:[12]

- provides for a 'strong' competitive process;
- eliminates interface risk and cost margins associated with multiple party contracting;
- provides inherent drivers to reduce contractor costs;
- enables '…*working collaboratively with a single contractor…to minimise project costs and mitigate project risks'*; and
- allows '…*time for rigorous pre-qualification assessment of non-price criteria…*'

53. We consider that the delivery model selected by ElectraNet is a conservative approach to contracting because:

- it will deliver a fixed-price contract for the Contractor to finalise design detail and construct the transmission lines and substation modifications – the Contractor therefore bears the majority of the project risk throughout the D&C stage;
- ElectraNet will bear the majority of the design risk – however, (i) the relatively prescriptive nature of the Specification (discussed further below), and (ii) adherence to ElectraNet's own standards, help to mitigate ElectraNet's design risk;

[11] ElectraNet-Eyre Peninsula Contingent Project - Procurement Summary_CONFIDENTIAL-May2020, page 3

[12] ElectraNet-Eyre Peninsula Contingent Project - Procurement Summary_CONFIDENTIAL-May2020, page 2

- the two-stage approach to agreeing a D&C contract should provide a reasonable basis for efficient risk allocation; and
- it does not involve any risk/gain-sharing mechanism – instead the two-stage RFT approach and the ECI stage provide opportunities for ElectraNet and the Contractor to each reduce their design and delivery risk through a collaborative approach.

54. The selected approach is not as conservative as the cost-plus model, which would lead to the majority of commercial risk being borne by ElectraNet. The selected approach also reduces ElectraNet's overhead and aspects of technical and commercial risk in dealing with more than one principal contractor. We assume from ElectraNet's decision not to pursue either of the multiple contractor approaches, that the potential delivered cost and risk benefits were assessed by it to not outweigh ElectraNet's increased delivery risks and costs.

55. Based on the information provided, the selected D&C/fixed-price delivery model appears to satisfy ElectraNet's project objectives better than the alternatives considered. The five stage approach[13] to signing a D&C contract with the preferred Contractor (or the back-up proponent) offers the potential to deliver the project at an efficient cost with an acceptable balance of risk between ElectraNet and the Contractor. As discussed below, we consider that the process could have afforded more opportunity for innovation to be introduced to the line design and construction methodology to reduce the overall delivered cost.

Tender Documents

The transmission line design has the greatest influence on overall EPRP cost

56. The transmission line design component of the EPRP is forecast to cost $217m or 75% of the total cost proposed by ElectraNet in its Contingent Project Application. It is the area of greatest potential savings - through a combination of design and construction optimisation.

57. We therefore reviewed whether ElectraNet's approach to ensuring that the best possible fit-for purpose line design is likely to be achieved at the least cost and at an acceptable balance of risk.

58. The major components of the transmission line costs are the structure and footing designs. To a large extent the structure and footing designs determine the construction costs and the easement requirements. We have therefore focussed on ElectraNet's line structure and footing design process and the opportunities included or progressively excluded for innovative (but technically prudent) means of achieving a prudent and efficient transmission line cost.

ElectraNet has selected only traditional steel pole and lattice tower designs for the EPRP

59. Design and construction standards for overhead line construction and substation design are relatively consistent across transmission utilities in Australia, which is important to ensure safety and long-term reliable performance of critical infrastructure.

60. However, within this framework there are different transmission structure designs and footing designs which may be deployed to prudently reduce cost. Factors to be considered include the characteristics of the transmission line electricity supply voltage/rating, route topography, cultural heritage, soil type, and ease or otherwise of obtaining easements/access for maintenance. Depending on the combination of the selected line route, structure and footing designs, there is the potential for faster construction, cheaper construction, less environmental and cultural heritage impact, and/or less easement width required – all of which reduce overall cost.

61. Among other things, we consider that good procurement practice for major transmission line projects will provide:

- a basis for 'apples-with-apples' comparison of multiple tenderers costs and construction ability – i.e. through conforming tenders; and

[13] Pre-tender (selection of the delivery model) , RFT, Revised RFT, negotiation with preferred contractor, ECI-stage negotiations

- incentives and scope for the identification and consideration of alternatives – typically via non-conforming offer(s).

62. To this end, the AER asked ElectraNet to explain what investigations of alternatives to its standard tower design and construction techniques it carried out. In response, ElectraNet listed a range of footing and structure types that were investigated during the early concept development stages for the project and provided an Engineering Design Report - Concept Footing and Alternative Structure Design.[14] The engineering design report was initially drafted in June 2019, with the latest June 2020 version intended for issue to the successful contractor at the commencement of the ECI stage. The table below summarises ElectraNet's findings for structure types.

Table 4.1: ElectraNet's findings for EPRP - transmission line structure types

Structure type	Summary of assessment	Finding
Tower & steel poles	Lattice towers and steel poles are currently the preferred structure types for the ElectraNet network due to the high level of structure reliability required.	✓ Suitable for all line sections
Spun reinforced concrete poles	Poles above 40m are generally not cost-effective.	✗ Likely to be more expensive than steel poles
Stobie poles	Large longitudinal loads cannot be sustained and so a Stobie pole line is prone to cascade failure.	✗ not suitable
Synthetic poles	Likely to deflect excessively under high winds.	✗ not suitable
2-pole light weight structures	*Individual structure components for a 2-pole structure will be lighter than a single pole, however, ElectraNet conclude that the benefit will not offset the extra transport & handling costs, and the need for 2 footings instead of one.* *The benefits of the lighter poles are best achieved if direct embedded into their footings. The disadvantage is that significant measures will need to be implemented to ensure the uplift capacity of the footing can be achieved*.	✗ too expensive

Source: ElectraNet, Engineering Design Report - Concept Footing and Alternative Structure Design, June 2020 version 1.1, pages 17-18

63. ElectraNet has essentially ruled-out alternatives to the traditional designs. ElectraNet required that steel towers and steel poles are designed and constructed in accordance with its specifications:

> *All requirements for transmission line structures shall be as detailed in sections below and as specified in document 14172-ECS-002 Section 3.2a: Transmission Lines – Detailed Design and document 14172-ECS-003 Section 3.2b: Transmission Lines - Construction.*[15]

64. As shown in the table above, there are only two paragraphs in the Engineering Design Report regarding 2-pole light weight structures. This appears to us to be a superficial analysis. At our workshop with ElectraNet we asked follow-up questions regarding '*alternative tower design and line stringing methods such as the use of guyed towers…and aerial construction methods?'*[16]

65. ElectraNet advised that '[g]uyed structures were also considered but discounted for use on the Eyre Peninsula due to substantial land being used for crops. The use of guyed structures in these circumstances was considered too risky given the potential for damage

[14] ElectraNet response to AER IR 15 June 2020, question 2

[15] Attachment 2 - Engineering Contract Specification_30Jan2020_version 1.1_PUBLIC, section 5

[16] AER Information Request, 17 July 2020, question 2c

during farming activities.'[17] No evidence of the analysis that led to this conclusion has been provided.

66. On the basis of its assessment ElectraNet specified lattice towers and steel poles in the tender Specification (requiring compliance with its Asset Design Manuals) which (i) provides a consistent basis for tender comparison, but (ii) *potentially* reduces the scope for cost savings. As discussed below, we understand that tenderers were permitted to submit non-conforming tenders, and there are opportunities through the ECI and D&C stages of the project to optimise costs and designs. However, we remain concerned that the scope for meaningful change is now limited.

ElectraNet has retained concrete and concrete-less footing designs for further consideration[18]

67. ElectraNet advises that the line corridor traverses soil types ranging from hard clay, sand/clay, collapsing soils, and soft and hard rock and that soil stabilisation procedures will need to be adopted at locations where there is a risk of collapsing soils. ElectraNet considered ten footing design types. We summarise the recommendations as follows:

- standard reinforced concrete bored pier and rock socket footings are suitable for a large proportion of the line;
- rock anchors will most likely be used at sites with shallow hard rock; and
- 'concrete-less' footings – it is possible that screw piles and/or direct embedded pole footings will be used.

68. ElectraNet's preliminary design study retained two concrete-less footing designs for further consideration before selection of optimised footings for final design (e.g. they will be considered for remote sites where concrete delivery may potentially present a high risk for constructability).[19]

69. We consider that ElectraNet has considered a reasonable range of footing designs. Retaining a range of footing designs for more detailed analysis during the rest of the project keeps the door open for cost optimisation.

Solicitation of Tenders

The pre-qualification phase may not have captured available international expertise

70. ElectraNet advises that its Buying Team undertook an initial market assessment of contracts in the 2019 September quarter, assessing the suitability of potential contractors for Substation Works, Civil Works and Stringing and Erection works. The assessment areas were:[20]

- '*proven capability in Australia;*
- *scope and scale of previous projects;*
- *resource availability for projects of scale; and*
- *systems and management structure for projects of this scale*.'

71. Six potential substation works contractors, six lines contractors and seven civil contractors were identified. ElectraNet selected only two *'Tier 1 contractors with the proven capacity, capability and experience in Australia for the delivery of transmission line projects of this scale'* to participate in the RFT process.[21]

[17] AER Information Request, 17 July 2020, question 2c

[18] ElectraNet, Engineering Design Report - Concept Footing and Alternative Structure Design, June 2020 version 1.1, pages 18 - 23

[19] Including durability, constructability, reliability, maintenance

[20] ElectraNet-Eyre Peninsula Contingent Project - Procurement Summary_CONFIDENTIAL-May2020, page 3

[21] ElectraNet-Eyre Peninsula Contingent Project - Procurement Summary_CONFIDENTIAL-May2020, page 3

72. International expertise and approaches to design and construction techniques is often considered a valuable component of achieving the best possible solution. There is insufficient information for us to determine whether ElectraNet's solicitation of interested parties for the EPRP included input from 'tier 1' international transmission line and substation design and construction firms in addition to one of the shortlisted proponents. We would expect that given ElectraNet's selection criteria, consortia with Australian firm(s) would be required to be short listed in the absence of an Australian presence.

The tendered prices may have been compromised by the relatively short tender periods

73. The RFT was issued to the two shortlisted proponents on 24 December 2019 and closed on 10 January 2020 with both short-listed proponents submitting conforming but high level offers in accordance with ElectraNet's requirements.[22] Version 1.0 of the Engineering Contract Specification (Specification) was released with the 24 December 2019 RFT.

74. We are concerned that this is a very short response period, with less than 10 working days for the tenderers to prepare a response over the holiday period. We do not consider this to be consistent with good practice and it may have affected the quality of the responses.

75. A second RFT was issued to the two shortlisted proponents in 'early' February 2020, including what ElectraNet refers to as 'examples of efficiencies' incorporated into the revised Specification:[23]

- refinements to the telecommunications scope;
- reductions in quantities of minor plant; and
- removal of some options based on initial tender outcomes.

76. This second tender period was open for more than 10 working days and mitigates, but does not eliminate, our concerns regarding the adequacy of the time for proponents to submit their respective BAFO.

77. The apparent absence of challenges to the procurement process and the outcome is another indicator that the process did not violate probity rules, however it does not rule out our residual concern that the BAFOs were as low as could reasonably be achieved.

Minor changes to the Specification have provided only minor cost efficiency improvements

78. The changes to the Specification between the first and second versions are relatively minor and therefore only minor 'efficiencies' were incorporated. ElectraNet considers that *'[t]his outcome confirmed the original technical scope was suitably robust, and that the scope for further material savings and efficiencies through the course of more detailed project planning and design work was likely to be more limited in nature.'*[24]

79. In our view, the relatively minor changes between the initial and revised RFT reflects the relatively conservative nature of the Specification. Nonetheless, as discussed below, the RFT did allow for tenderers to identify savings opportunities in their responses.

Evaluation of Tenders

Good tender evaluation practices appear to have been followed

80. ElectraNet advises that its tender assessment criteria were developed in advance of assessing the tenders. The tender evaluation criteria included cost and non-price elements, which is consistent with good industry practice.

81. The price component included a BAFO from each tenderer and pricing for allowances (switching, relocation of infrastructure, upgrading fences and gates, forex commodity variation, and new contractor training). The selected Contractor was materially cheaper than the other shortlisted tenderer.

[22] ElectraNet-Eyre Peninsula Contingent Project - Procurement Summary_CONFIDENTIAL-May2020, page 3

[23] ElectraNet response to AER IR 17 July 2020, question 2a

[24] ElectraNet response to AER IR 17 July 2020, question 2a

82. [redacted]

83. On this basis, we consider that the preferred Contractor has been reasonably selected and the BAFO of [redacted] (including [redacted] for allowances), which is the starting point for subsequent negotiations, has been achieved from a competitive tender process.

The tender process did not achieve or identify significant cost saving opportunities

84. The AER asked several questions regarding the 'value add opportunities for cost savings' that were revealed during the tender process given (i) that they may have a material impact on the delivered cost and (ii) the allocation of the [redacted] to the preferred tenderer. ElectraNet replied:[25]

> *'Tenders were assessed on both these opportunities and their perceived ability to realise cost savings in the course of the delivery of the project. All available efficiencies and potential cost saving opportunities known at the time have been captured in the revised February 2020 technical scope and in the final tendered costs received in response. No additional value add opportunities were identified in tenders that had not already been reflected in the revised technical scope and in these tendered costs. Following the design clarifications and refinements incorporated in the revised February 2020 technical scope and given the level of definition in that scope, the potential for further cost saving opportunities through the design phase is considered to be relatively limited as discussed above.'*

85. No reference is made by ElectraNet to non-conforming tenders by which the tenderers could offer alternatives to the Specification requirements. We therefore assume none were submitted.

86. The potential savings included in the February 2020 RFT were, in ElectraNet's words, *'relatively minor in nature'*[26] and ElectraNet believes there is little potential scope for further cost savings.

87. This confirms our concerns that the RFT process offered little incentive and possibly little scope for (credible) cost savings to be identified prior to the D&C stage (from which time it is likely than any further cost savings will be retained by the Contractor).

88. We consider that this *may* have resulted in a missed opportunity to fully identify and explore all options for reducing transmission line design and construction costs whilst still satisfying prudent design and construction safety and other standards.

Negotiation and Award of Contract

Negotiation of efficient risk allocation is provided for in the ECI stage

89. ElectraNet's ECI stage presents an opportunity for both parties to determine an efficient allocation of risk and to finalise other contractual matters (such as the scope for both parties, schedule, and cost). This phase is yet to be completed.

90. ElectraNet has, however, identified risk allowances for itself which it maintains represent a reasonable basis for inclusion in the total project cost. We discuss the Risk Allowance in section 6.

[25] ElectraNet response to AER IR 17 July 2020, question 2b

[26] ElectraNet response to AER IR 17 July 2020, question 2a

Opportunities for further transmission line and substation cost reductions appear to be limited

91. ElectraNet describes the scope of work of the Contractor as follows:[27]

> *'design, procure, construct, commission and handover a new double circuit transmission line from Cultana to Port Lincoln Terminal substations plus the required brownfield works at existing substation sites to connect the new line to the network.'*

92. ElectraNet identified in its responses to the AER that involvement of the Contractor in the design is part of the ECI process (and subsequent processes if they proceed) remains an opportunity for further price reduction. ElectraNet advised at our workshop with them that there are opportunities for the Contractor to propose alternate tower designs and installation methods. However, opportunities may be limited given that:

- the line route itself is largely settled;
- the conductor type has been finalised;
- the insulator types have been finalised;
- the preliminary design elements as advised during the approvals process cannot be substantially modified;
- the existing substations, existing footprints, and other infrastructure cannot be substantially modified; and
- there are Cultural Heritage areas, and other construction limitations.

93. ElectraNet added that any alternate designs proposed will need to meet minimum design criteria and engineering standards. However, some scope had been left for the Contractor to provide alternative tower configuration(s):[28]

> *'The configuration of the towers obtained from preliminary design shall be adopted in detailed design unless the Contractor can propose a better alternative that meets ElectraNet approval.'*

94. For new overhead conductor ElectraNet defined the type and configuration and the relevant specification.

95. ElectraNet noted that a potential area for design optimisation may involve:[29]

> *the use of fewer towers and longer spans for example, which could reduce the number of structures to be supplied and installed. However, this would also require larger and stronger structures, fittings and footings and potentially more complex erection and stringing methods, which would reduce the scope for any net cost savings.*

96. ElectraNet also noted that:[30]

> *Given the nature of the fixed price arrangement, it is also possible that any savings and efficiencies identified in line delivery and design could be offset by unforeseen costs and scope items based on the risks being borne by the contractor. This needs to be borne in mind in considering the scope and likelihood of any net cost savings.*

97. The primary opportunities for reducing costs arise in the conceptual design phase, the tender phase, and, in the case of this project (but to a lesser degree), in the ECI stage. Sufficient time and competitive tension and/or adequate incentives are required to extract least cost, technically acceptable design and construction methodologies.

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[27] Attachment 2 - Engineering Contract Specification_30Jan2020_version 1.1_PUBLIC, section 2

[28] Attachment 2 - review designs produced by the contractor. Engineering Contract Specification_30Jan2020_version 1.1_PUBLIC, section 5

[29] Response to AER Information Request of 17 July 2020_CONFIDENTIAL, page 8

[30] Response to AER Information Request of 17 July 2020_CONFIDENTIAL, page 8

98. The opportunity for further net cost reductions diminishes in the D&C stage because transmission infrastructure design changes usually cost more, not less.

99. From our understanding of the D&C stage for the EPRP, the Contractor will only be incentivised to seek efficiency gains if it faces cost increases which it has to cover under the terms of the Contract. It is therefore unlikely that any portion of savings made during the D&C stage will accrue to ElectraNet.

100. We therefore conclude that that the opportunities for innovation in the design of structures and footings for the EPRP has now largely passed.

4.3 Summary of our findings

101. We have considered whether ElectraNet has implemented an effective tender process to secure competitive prices and terms and conditions for the transmission line and substation components of the EPRP.

The tender process followed by ElectraNet has led to a competitive outcome

102. We consider that ElectraNet's procurement objectives, use of a Buying Team, and the selection of the fixed-price D&C delivery model to be appropriate for the EPRP. The tender evaluation process followed good industry practice in allowing a fair comparison of price and non-price elements pertaining to the responses of two experienced and capable short-listed tenderers. The preferred tender for the transmission line and substation-related work was superior overall to that from the other tenderer on both price and non-price dimensions.

103. Whilst we identified several aspects of ElectraNet's tender process that were not ideal, we find that they are unlikely to have detracted materially from achieving a competitive outcome for the line and substation activities to be undertaken by the D&C Contractor. In summary, our procedural concerns are:

- the apparent lack of appointment of a probity auditor to independently oversee the tender process – nonetheless, we have no reason to believe that the absence of a probity auditor, if this is the case, affected the BAFO achieved;
- the relatively short amount of time (including over the Christmas/New Year holiday period) for the tenderers to prepare both the initial and revised tenders – again, we have not seen any evidence that this approach compromised the outcome materially; and
- the tender solicitation phase may not have adequately explored all possible avenues for lowering the BAFO, but we do not consider that out concern compromised achievement of a competitive outcome.

104. Overall, we consider that the BAFO achieved from ElectraNet's tender process is an outcome of an adequate competitive tender process.

A lower final cost of the transmission line may have been achieved with improvements to the procurement process

105. The transmission line component of the project represents 75% of the total cost. We therefore focussed on the extent to which ElectraNet's tender process and selected delivery model has enabled or will enable identification, assessment, and realisation of the most cost effective transmission line design and construction techniques.

106. We looked at this in three stages:

- options identified and considered by ElectraNet prior to the tender;
- options proposed by tenderers and ElectraNet's consideration of them; and
- remaining opportunities for cost efficiency gains to be identified.

107. We consider that the two-stage delivery model (i.e. ECI and D&C stages) gives both parties the opportunity to collaboratively refine the scope, cost, schedule, and risk allocation prior to entering into the D&C contract.

108. Based on the information provided, including at our workshop with ElectraNet, we conclude that ElectraNet's approach and process *may* have compromised achievement of the most cost effective approaches to transmission line design and construction because:

- the apparently superficial assessment of alternative line design and construction techniques by ElectraNet in the pre-tender phase may have precluded robust assessment of potentially technically acceptable cost-effective alternatives to ElectraNet's Specification;
- the limited time to prepare tender responses and apparently narrow technical envelope in which Tenderers were able to respond may have limited the capacity to develop compelling non-conforming tenders (i.e. with alternative design and/or construction methodologies);
- there are apparently limited competitive or commercial incentives for the preferred Contractor to identify cost-effective approaches during the ECI stage; and
- there may be commercial incentives in the D&C stage for the Contractor to implement more cost effective construction techniques in the D&C stage, but net benefits (if any) are likely to be retained by the Contractor.

109. We stress that we have identified these as potential improvement opportunities to the tender process to achieve greater transmission line cost savings, not as a definitive assessment that a lower transmission line cost could be achieved compared to the process followed.

110. We have no material concerns regarding the process to achieve the BAFO component of the substation-related activities to be undertaken by the Contractor.

5 PROJECT DELIVERY COST

We have reviewed ElectraNet's Project Delivery Costs, focussing on the internal labour costs for the ECI and D&C stages of work. Based on our top-down and bottom-up analysis, we consider that the combined ECI stage and D&C stage cost is likely to be overstated by between 25%-35%.

5.1 Introduction

111. In this section we review components of the Project Delivery Costs (or overheads) that ElectraNet has included in its project cost estimate to manage its responsibilities, including project management, throughout the ECI stage and D&C stage.

5.2 Overview of Project Delivery Costs

112. The table below summarises the project delivery costs incurred and to be incurred by ElectraNet in delivering the EPRP.

Table 5.1: ElectraNet Project Delivery cost summary - $k, nominal

Project stage	Description	Cost
Prior RIT-T costs	75% of RIT-T development costs transferred	[redacted]
Actual costs to date	Actual costs incurred by EN from April 2017 to 30 April 2020	[redacted]
Factory visits	Pre-qualification and material manufacture and fabrication	[redacted]
Network planning studies	ElectraNet has engaged a specialist consultant to model the impacts of the transmission network changes and determine the design criteria to be used.	[redacted]
Lidar survey	A consultant has been contracted to provide an Aerial Laser Survey (LiDAR) of the entire route.	[redacted]
General expenses	General expenses, site visits, travel, vehicles, labour escal'n	[redacted]
Site office	North and South offices	[redacted]
Exchange rate hedging	Call option	[redacted]
Dilapidation reports		[redacted]
Sub-Total – Other costs incurred or to be incurred by ElectraNet		**11,651**
Early Contractor Involvement (ECI) stage	May 2020 to award of D&C contract (scheduled for Nov 202)	2,737
Design & Construction (D&C) stage	D&C stage includes energisation, and project handover and closeout	18,275
Sub-Total- internal labour forecast to be incurred by ElectraNet		**21,012**
Total		**32,663**

EN EC.14172 Basis of Estimate for AER, page 24; Response to AER IR 17JUL20, pages 24-28

5.3 Our assessment methodology

5.3.1 Our initial assessment approach

We reviewed available information, sought additional information, and discussed the basis for the Project Delivery Cost with ElectraNet

113. We followed a five-part process for assessing the reasonableness of the capital costs included by ElectraNet for its Project Delivery Cost:

1. review material initially provided by the AER, including ElectraNet's Contingent Project Application itself, and supporting information provided by ElectraNet;
2. contribute to written Information Requests from the AER to ElectraNet concerning the Project Delivery Cost (among other matters) to help us understand the basis for the Project Delivery Cost estimate;
3. review responses from ElectraNet;
4. attend a video-conference meeting with the AER and ElectraNet at which we further explored the basis for the Project Delivery cost (among other things); and
5. take the information derived from parts 1-4 above into account in our assessment of the reasonableness of ElectraNet's Project Delivery Costs.

We applied a top-down and bottom-up approach to assessing the reasonableness of the proposed internal labour component of the Project Delivery Cost

114. Out top-down assessment used benchmarking where practicable, but is essentially based on our experience-based assessment of whether the numbers of FTEs allocated by ElectraNet appear to be reasonable for the defined ElectraNet responsibilities (cognisant of the proposed Contractor roles and responsibilities) throughout the course of the ECI and D&C stages.

115. Our bottom-up assessment is based on the estimated labour unit costs (i.e. cost per FTE). ElectraNet provided its Project Team structure, FTE count for the ECI and D&C stages and a brief description of the roles and responsibilities in response to our further requests for information to justify its cost estimate. This supplemented detail in other documentation which explained the Basis of Estimate and the roles and responsibilities of ElectraNet and the Contractor in the ECI and D&C stages. ElectraNet did not provide labour unit cost detail. In the absence of this, we estimated unit costs based on two sources:

- our own experience; and
- Hays Salary Guide 2019-20 – drawing on the South Australian – Adelaide salaries guide and selecting what we consider to be the closest equivalent role/seniority for the relevant sector.

116. Our assumed unit costs include a 40% overhead (i.e. on top of the estimated salaries) as an estimate of the indirect costs (shared Corporate costs, super, annual leave etc) that ElectraNet might reasonably incur for each of the members of the Project Team. Where we considered that contractors/consultants are likely to fill the roles (based on ElectraNet's information), we have increased the unit cost with a further loading. Finally, we added a site allowance component to certain roles in the D&C stage.

5.3.2 Cost allocation and benchmarking

ElectraNet's proposed cost allocation approach is reasonable

117. ElectraNet advises that the costs in Table 5.2 are internal labour estimates and have been or will been captured by direct timesheet bookings to the project – so partial FTEs should not be double counting costs to the project. This is consistent with good industry practice

although allowance for periodic audits of the bookings to the project should be undertaken to provide assurance that the cost is efficient.

Benchmarking is inconclusive

118. ElectraNet has referred in its response to the AER's request for information that its total project delivery cost of less than 10% of the Project cost (excluding foreign currency hedging costs) for a complex greenfields project is consistent with previously accepted benchmarks.[31]

119. Our understanding is that the benchmark ElectraNet is referring to was initiated over 10 years ago and we are unaware of the basis of the assessment.

120. However, there are recognised project overhead cost benchmarks, which are typically 10-12% of total project costs for large, complex projects. However, in this case that would also include the Contractor's project management costs which we understand to be approximately 6% of its costs.[32] On this basis, the ElectraNet delivery costs should be less than 10% of total costs.

5.4 ECI stage costs

5.4.1 Overview

ECI stage duration

121. The ECI stage is planned to commence in May 2020 and conclude with award of the D&C contract in November 2020 (i.e. a forecast period of 7 months).[33]

ElectraNet's internal labour cost components

122. ElectraNet has provided the ECI stage cost structure and estimates shown in the table below. These components are largely consistent with the project team structure (which we discuss below).

Table 5.2: ElectraNet ECI stage project deliver costs - $k, nominal

ECI cost component	Cost
Project management	980
Network Planning	25
Engineering and Operations	1,348
Safety and sustainability, Land Services	138
Procurement and Contracts	233
Stakeholder Engagement	13
Total	**2,737**

Source: ElectraNet, Eyre Peninsula Reinforcement Contingent Project Response to AER Information Request dated 15 June 2020

ElectraNet's ECI project Team

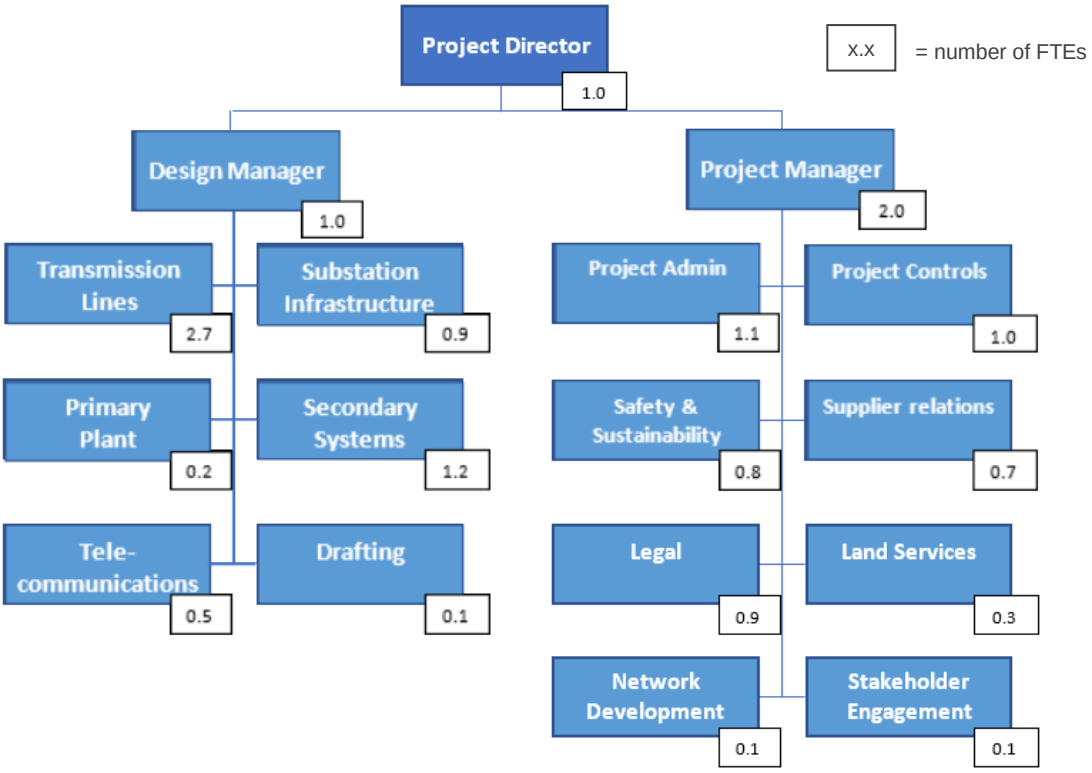
123. The figure below shows ElectraNet's Project Team for the ECI stage. In total it comprises an allocation of 14.6 FTEs including the Project Director on average across the ECI stage.

31 *Ibid, question 1c*

32 ElectraNet, Attachment 4 – Reconciliation of summary cost breakdown-CONFIDENTIAL

33 ElectraNet, Response to AER Information Request – 17 July 2020, page 2

Figure 5.1: ElectraNet Project Team structure (ECI stage)



Source: EMCa modified version of EN IR response – Attachment 1 - Project Organisation Chart_CONFIDENTIAL

5.4.2 Our initial assessment

Our top-down assessment is that 14.6 FTEs for the ECI phase appears to be excessive

124. In our opinion, there is insufficient justification for having a Project Director (1.0 FTE), a Design Manager (1.0 FTE) and two Project Managers (2.0 FTE) for the ECI stage. We consider that one Project Manager role (1.0 FTE) is superfluous for the following reasons:

- from the cost estimate for the Project Management function, the project manager role is (and should be) positioned as a senior/experienced project manager; and
- based on the cost estimates for the eight disciplines under the Project Manager, there is likely to be senior specialists in each discipline, reducing the Project Manager' burden.

Based on our bottom-up assessment, the ECI stage Project management cost appears to be overstated

125. The Project Management function comprises five roles at a cost of $0.98m, as shown in the table below.

Table 5.3: ElectraNet ECI stage Project Management resourcing - $k, nominal

Project management roles	#FTEs	Cost
Project Director	1.0	
Project Managers	2.0	
Project administrator	1.0	
Document controller	0.1	
Project Controller	1.0	
	5.1	**980**

Source: EN IR response – Attachment 1 - Project Organisation Chart_CONFIDENTIAL

126. ElectraNet advises that the project management roles during the ECI stage include:[34]

- total program delivery and governance;
- project administration and reporting;
- project cost and schedule control;
- overall risk management and interface management; and
- management of team and consultants.

127. These roles are as we would expect for a major project and the five roles designated by ElectraNet to deliver the tasks associated with these responsibilities is consistent with good project management practice for a project of this size and complexity.

128. A full time Project Director, Project Administrator and Project Controller are likely to be necessary for the ECI period. The part-time document controller role is also appropriate. However, we consider that:

- the total cost of $980k is between 15% to 30% too high for the nominated 5.1 FTEs based on our bottom-up assessment; and
- two Project Managers are unlikely to be required during the ECI phase because each of the following reduces the relative project management burden:
    i. the relative short duration of the ECI stage
    ii. there is a Project Director, a Design Manager, and supporting teams
    iii. the Contractor will be providing a significant amount of reporting in a format ElectraNet specifies.

129. When we apply our labour unit cost estimates to the number of FTEs that we consider is reasonably required for the ECI stage and our estimates of unit costs, we consider that the Project Management costs for the ECI stage are overstated by between 30% to 45%.

Based on our bottom-up assessment, the ECI stage Engineering and Operations cost appears to be overstated

130. ElectraNet has allowed $1.35m and 6.6 FTE for the ECI stage Engineering and Operations function, as shown in the table below.

Table 5.4: ElectraNet ECI stage Engineering & Operations resourcing - $k, nominal

Engineering and operations roles	#FTEs	Cost
Design Manager	1.0	
Transmission lines	2.7	
Substation infrastructure	0.9	
Primary Plant	0.2	
Secondary systems	1.2	
Telecommunications	0.5	
Drafting	0.1	
	6.6	**$1,348**

Source: EN IR response – Attachment 1 - Project Organisation Chart_CONFIDENTIAL

131. ElectraNet advises that the Engineering and Operations roles during the ECI stage include:[35]

- preparation of technical scopes;

[34] ElectraNet response to AER Information Request 17 July 2020, page 22

[35] ElectraNet response to AER Information Request 17 July 2020, page 22

- development and preparation of concept and preliminary designs;
- design reviews and monitoring;
- engineering support during design;
- factory audits, inspections and test witnessing;
- outage planning; and
- determination of asset strategies and requirements.

132. We consider that the functions identified in Figure 5.1 are consistent with good project management practice for the scope, complexity, and risk posed by this project.

133. Of the $1.35m, $350k (87 days) has been estimated for factory visits in Asia, North America, and Europe for pre-qualification factory inspection/audits and materials manufacture and fabrication inspections.[36] It is unlikely that the international trips will occur due to COVID-19, however ElectraNet argues that employing local consultants will cost an equivalent amount. This seems to be a reasonable assumption and the cost estimate appears to be reasonable.

134. We consider the resource allocation for Primary Plant, Drafting, and Telecommunications to be reasonable.

135. That means approximately 4.5 FTEs on average are assumed to be required over the ECI period on matters related to Transmission lines, Substation Infrastructure and Secondary systems. This appears to be a high estimate given:

- the sunk costs on this project through to April 2020; and
- minimal changes are expected to the line route, the conductor type and insulator type are finalised, and given the 'use of existing substations, existing footprints, and other infrastructure [which] cannot be substantially modified.'[37]

136. Even allowing for the full contingent of 6.6 FTEs on average over the ECI stage, when we apply our estimate of reasonable unit costs, we consider the Engineering & Operations cost to be overstated by between 25% to 35%.

Based on our bottom-up assessment, the ECI stage Network Planning cost appears to be overstated

137. Allocation of 0.1 FTE for the Network planning function is reasonable. The total cost of $25k during the ECI phase appears high but the impact of a lower unit cost is small in absolute terms.

Based on our bottom-up assessment, the ECI stage Safety and Sustainability, Land Services cost appears to be reasonable

138. ElectraNet advises that the roles during the ECI stage include safety in design, safety review and management, environmental advice, review and management and easement management matters.[38] Allocation of 1.1 FTEs on average at a total cost of $138k appears to be reasonable.

Based on our bottom-up assessment, the ECI stage Procurement and Contracts and Legal costs appear to be overstated

139. ElectraNet has allocated 1.6 FTEs on average over the ECI stage at a total cost of $233k to undertake the following roles:[39]

- preparation and acquisition strategies and purchase recommendations reports;
- management of tendering;

[36] EN, Basis of cost estimate Report – CONFIDENTIAL, page 26

[37] ElectraNet response to AER Information Request 15 June 2020, pages 23-24

[38] ElectraNet response to AER Information Request 17 July 2020, page 22

[39] ElectraNet response to AER Information Request 17 July 2020, page 23

- management of pre-qualification, and;
- contract establishment and contract administration.

140. In our view, a significant part of the activities is likely to have been completed prior to April 2020 (i.e. sunk costs). Based on our bottom-up analysis of the required FTEs and our estimate of the unit costs, we consider that the equivalent of 1.0 FTE (for contract establishment) is likely to be required and that a reasonable cost is likely to be 50% of the proposed amount.

Based on our bottom-up assessment, the ECI stage stakeholder engagement cost appears to be overstated

141. Allocation of 0.1 FTEs on average over the ECI stage is reasonable, however the cost of $13k for the Stakeholder engagement function appears to be overstated, but the impact on the total cost is minor.

5.4.3 Summary of our findings on ElectraNet's proposed ECI overheads

142. We have undertaken a bottom-up and top down assessment of the Project team (ECI) costs. For our bottom-up assessment we have applied a combination of our industry experience and the Hays 2019/20 Salary guide.

143. Overall, based on our bottom-up analysis of the required FTEs and our estimate of the unit costs, we consider that:

- ElectraNet's Project Team (ECI) structure is suitable for the project type, scope, and complexity; and
- ElectraNet's estimate for its ECI stage Project Delivery costs is likely to be overstated by between 20% to 30%.

5.5 Design and Construct stage costs

5.5.1 Overview

D&C stage

144. The Design & Construct stage is planned to commence in December 2020 and include energisation in December 2022 with project completion/handover six months later (i.e. approximately 30 months duration).[40]

ElectraNet cost components – D&C stage

145. ElectraNet has provided the D&C stage cost structure and estimates shown in the table below. These components are largely consistent with the project team structure (which we discuss below).

Table 5.5: ElectraNet's D&C stage cost components - $k, nominal

D&C cost component	Cost
Project management	5,091
Engineering and Operations	5,626
Network Planning	282
Construction management	2,510
Safety, Sustainability and Land Services	3,223

40 ElectraNet, Response to AER Information Request – 17 July 2020, page 2

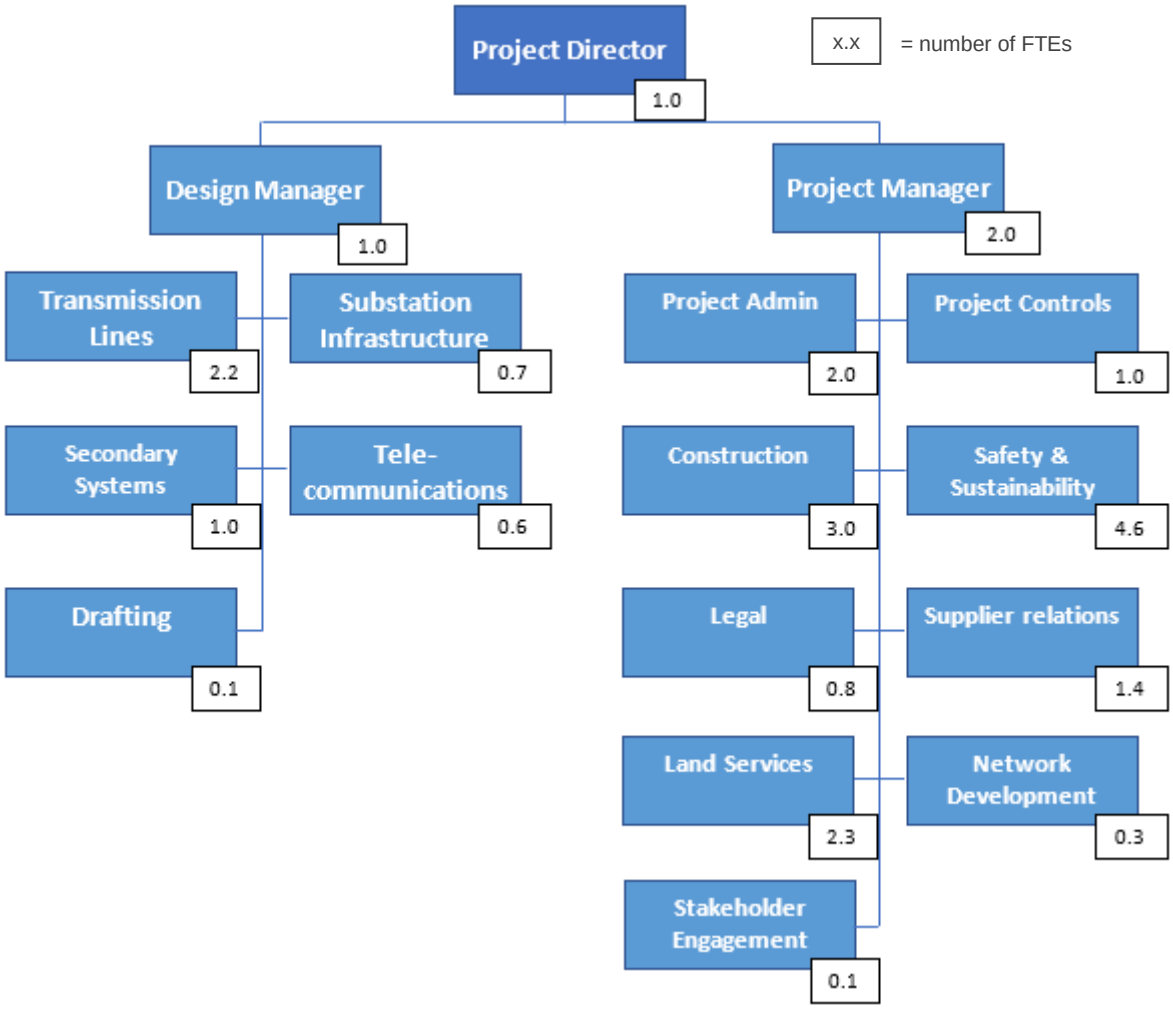
Procurement and Contracts	1,463
Stakeholder engagement	80
Total	**18,275**

Source: ElectraNet, Eyre Peninsula Reinforcement Contingent Project Response to AER Information Request dated 15 June 2020

ElectraNet's D&C Project Team

146. The figure below shows ElectraNet's Project Team for the D&C stage. In total it comprises an allocation of 24.1 FTEs (including the Project Director) on average across the D&C stage.

Figure 5.2: ElectraNet's Project Team structure (D&C stage)



Source: EMCa modified version of EN IR response – Attachment 1 - Project Organisation Chart_CONFIDENTIAL

5.5.2 Our initial assessment

ElectraNet's proposed cost allocation approach for the D&C stage is reasonable

147. EN advises that the costs shown in Table 5.5 are internal labour estimates and have been or will been captured by direct timesheet bookings to the project – so partial FTEs should not be double counting costs to the project. This is consistent with good industry practice although allowance for periodic audits of the bookings to the project should be undertaken to provide assurance that the cost is efficient.

Our top-down assessment is that 24.1 FTEs for the D&C phase appears to be overstated

148. In our opinion, there is insufficient justification for having a Project Director (1.0 FTE), a Design Manager (1.0 FTE) and two Project Managers (2.0 FTE) for the D&C stage for the same reasons we describe for the ECI stage.

149. ElectraNet's total cost for the D&C stage is very similar to the cost achieved by scaling the ECI stage costs to the longer D&C period and adjusting for the additional FTEs. Given that ElectraNet names the personnel for 90% of the personnel in the D&C team,[41] it *appears* that ElectraNet has primarily estimated the D&C stage cost by scaling. If this were the case, then it is likely that the estimate is overstated because far fewer resources are required post-energisation through to the end of the project. However, we do not have sufficient information from ElectraNet to confirm this or otherwise.

Based on our bottom-up assessment, the D&C stage Project management cost estimate appears to be overstated

150. The Project management function comprises five roles at a cost of $5.09m, as shown in the table below.

Table 5.6: ElectraNet D&C stage Project Management resourcing - $k, nominal

Project management roles	#FTEs	Cost
Project Director	1.0	
Project Managers	2.0	
Project administrator	1.0	
Document controller	1.0	
Project Controller	1.0	
	6.0	**5,091**

Source: EN IR response – Attachment 1 - Project Organisation Chart_CONFIDENTIAL

151. ElectraNet advises that the project management roles during the D&C stage are the same as for the ECI stage.[42] These roles are as we would expect for a major project and the five roles designated by ElectraNet to deliver the tasks associated with these responsibilities is consistent with good project management practice for a project of this size and complexity.

152. On average, a full time Project Director, Project Administrator, Project Controller and Document Controller is likely to be required over the duration of the D&C stage. However, we consider that:

- the total cost of $5.1m is 25% to 40% too high for the nominated 6.0 FTEs; and
- two Project Managers are unlikely to be required during the D&C phase because each of the following reduces the relative project management burden:
    i. there is a Project Director, a Design Manager, and well-resourced supporting teams, all reducing the effective workload of the Project Manager role
    ii. the Contractor will be providing a significant amount of reporting in a format ElectraNet specifies.

153. Based on our bottom-up analysis of the required FTEs and our estimate of the unit costs, we consider that the Project Management cost for the D&C phase is overstated by between 40% to 50%.

41 Only 5 positions are vacant Field Construction Advisers (3FTE); Field Safety (0.7 FTE) and Cultural Heritage (1.4FTE)

42 ElectraNet response to AER Information Request 17 July 2020, page 16

Based on our bottom-up assessment, the D&C stage Engineering and Operations cost appears to be overstated

154. ElectraNet has allowed $5.63m and 5.6 FTE for the D&C stage Engineering and Operations function, as shown in the table below.

Table 5.7: ElectraNet D&C stage Engineering & Operations resourcing - $k, nominal

Engineering and operations roles	#FTEs	Cost
Design Manager	1.0	
Transmission lines	2.2	
Substation infrastructure	0.7	
Secondary systems	1.0	
Telecommunications	0.6	
Drafting	0.1	
	5.6	**$5,626**

Source: EN IR response – Attachment 1 - Project Organisation Chart_CONFIDENTIAL

155. ElectraNet advises that the Engineering and Operations roles during the D&C stage that are the same as for the ECI stage are: [43]

- preparation of technical scopes;
- development and preparation of concept and preliminary designs;
- design reviews and monitoring;
- factory audits, inspections and test witnessing;
- outage planning; and
- determination of asset strategies and requirements.

156. The additional roles in the D&C stage are:

- engineering support during construction and commissioning; and
- asset handover.

157. We consider that the functions identified in Figure 5.1 are consistent with good project management practice for the scope, complexity, and risk posed by this project.

158. ElectraNet's projected D&C stage resource intensity is 85% of that assumed for the ECI phase.[44] However, in our view, there will be a lower resource intensity for the Engineering and Operations function during the D&C stage. For example, we expect preparation of technical scopes, development and preparation of concept and preliminary designs and determination of asset strategies and requirements to be largely completed in the ECI phase.

159. Even allowing for the full contingent of 6.0 FTEs on average over the entire D&CI stage as ElectraNet has done, when we apply our estimate of reasonable unit costs, we consider the Engineering & Operations cost to be overstated by between 35% to 45%.

Based on our bottom-up assessment, the D&C stage Network Planning cost appears to be overstated

160. The estimated cost for this function is $0.28m. Allocation of 0.3 FTE for network planning (system studies and analysis, network configuration studies and impacts and fault level and earthing impact studies) is reasonable. Nonetheless, we consider the unit cost to be overstated by 45%.

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43 ElectraNet response to AER Information Request 17 July 2020, page 23

44 As measured by person months for the ECI phase

Based on our bottom-up assessment, the D&C Construction management cost appears to be overstated

161. ElectraNet has allowed for 3.0 FTEs for this function at cost of $2.51m. We consider that the majority of the resources for this function will be required until energisation, and the 3.0 FTE estimate appears to be reasonable.

162. However, when we apply our estimate of reasonable unit costs, we consider the D&C construction management cost to be overstated by 25%.

Based on our bottom-up assessment, the D&C Safety and Sustainability, and Land Services cost appears to be overstated

163. The estimated cost and resource requirement is $3.22m and 6.9 FTEs. ElectraNet advises that there are three added roles in the D&C stage compared to the ECI stage:

- site inspection and monitoring
- public consultations and communications; and
- corporate communications.

164. We consider each of these to be necessary additional roles for the two functions during the D&C stage. We also consider the resource intensity will be higher and sustained at a up to energisation, but that resource requirements will then taper off. Nonetheless, the estimated 6.9 FTEs for the D&C stage does not appear to be excessive.

165. However, when we apply our estimate of reasonable unit costs, we consider the Safety, Sustainability and Land Services cost to be overstated by between 10% to 20%.

Based on our bottom-up assessment, the D&C stage Procurement and Contracts (and Legal) costs appear to be overstated

166. ElectraNet has allocated 2.2 FTEs on average over the D&C stage at a cost of $1.46m to undertake the following roles in addition to those designated for the ECI stage:[45]

- Superintendent;
- management of tendering; and
- factor audits, inspections and test witnessing.

167. We consider that the allocation of 2.2 FTEs is reasonable. However, when we apply our estimate of reasonable unit costs, we consider the Procurement and Contracts (and Legal) cost to be overstated by between 65% to 70%.

Based on our bottom-up assessment, the D&C stage Stakeholder engagement costs appear to be overstated

168. Allocation of 0.1 FTEs on average over the ECI stage for the Stakeholder engagement function appears to be reasonable, however the unit cost appears to be overstated. The impact of ElectraNet's cost of $80k is relatively immaterial.

5.5.3 Summary of our findings on proposed D&C overheads

169. We have undertaken a bottom-up and top down assessment of the Project team (D&C) costs. For our bottom-up assessment we have applied a combination of our industry experience and the Hays 2019/20 Salary guide.

170. Overall, our finding is that:

- ElectraNet's Project Team (D&C) structure is suitable for the project type, scope, and complexity; and

[45] ElectraNet response to AER Information Request 17 July 2020, page 24

- ElectraNet's estimate for its Project Delivery Costs for the D&C stage is likely to be overstated by between 25% and 35%.

5.6 Consideration of further information provided by ElectraNet regarding ECI stage and D&C stage costs

171. After finalisation of our initial assessment, the AER provided ElectraNet with a written summary of our assessment procedure, as described in section 5.3.1, and verbal advice about our proposed adjustment of the Project Delivery Cost (overheads).

ElectraNet wrote to the AER on 9 September 2020

172. This prompted ElectraNet to write to the AER regarding the process we have followed, why it considered our proposed adjustment to be unreasonable, and why it considered that its proposed Project Delivery Cost (overheads) was justified.

173. The primary basis of ElectraNet's response was that its unit costs are commensurate with its Cost Allocation Methodology, and its Expenditure Forecasting Methodology, and that they are an accurate reflection of its current costs.

174. ElectraNet also provided a spreadsheet with its labour unit costs for each role in its project team for the AER and ourselves to take into account.

We have considered the new information provided by ElectraNet and it does not change our findings

175. We consider that even prior to ElectraNet being given the further opportunity to justify its Project Delivery Costs, ElectraNet had been afforded ample opportunity to provide whatever it considered necessary in response to our communicated intent to understand the basis for its estimate.

176. Nonetheless, we have reviewed ElectraNet's unit costs and its approach to applying the unit costs to determine total internal labour costs for the ECI and D&C stages.

177. In our opinion, ElectraNet's additional information supports our top-down assessment of the D&C period cost and our bottom-up assessment (from which we concluded that, overall, the unit rates are excessive). We remain of the view that the Project Delivery Cost (overheads) is likely to be overstated to the same extent as determined from our initial assessment.

178. Consideration of the implications of our findings in the context of ElectraNet's Expenditure Forecasting Methodology and Cost Allocation Methodology is a matter for the AER.

5.7 Other costs incurred or forecast to be incurred by ElectraNet

Cost incurred to date in the current RCP appear to be reasonable

179. Our understanding is that approximately half of the $6.0m incurred to date has been incurred prior to the current RCP and include costs incurred from planning the initial version of the project proposed by ElectraNet in 2012-2013.[46] ElectraNet states:[47]

> *'The actual costs to date (30 April 2020) are the costs ElectraNet has incurred since April 2017 to develop/transition the project from the planning stage through optioneering and*

[46] ElectraNet Contingent Project Application, footnote 13, page 16

[47] ElectraNet, Basis of Estimate Report, June 2020, version 1.0, page 24

conduct of the RIT-T to execution and CPA lodgement. They include all internal labour and expenses as well as the external specialist assistance required.'

180. Based on our experience, [redacted] is likely to be a reasonable amount incurred for planning and approvals of a major transmission project such as the EPRP.

Factory visit costs appear to be reasonable

181. The cost estimate is to undertake witnessing of tests. This is a prudent activity for the ElectraNet to help ensure quality of the manufactured products and on-time delivery.

182. Based on the descriptions of the cost estimates provided by ElectraNet, we consider that the forecast expenses for the witnessing of tower testing (likely to be carried out by local contractors in the county of manufacture) are likely to be required and appear reasonable.

General expenses appear to be reasonable

183. We note that ElectraNet has included [redacted] for labour escalation during the execution phase in this expenditure category. We have not been able to verify the basis for this amount.

184. The amounts for the balance of the general expenses comprise expenses associated with site visits during the 'definition' phase ([redacted] and 'execution' phase [redacted] appear to be reasonable if ElectraNet has to hire all the vehicles for the project team (i.e. rather than use its own vehicles).

Hedging against unfavourable exchange rate variation is prudent

185. Whilst it is outside of our expertise to assess the reasonable cost of hedging foreign exchange risk, we consider that it is prudent for ElectraNet to hedge its risk.

Remaining Other costs

186. The majority of the remaining costs have been incurred or are relatively minor (Offices, Dilapidation reports). We have not assessed the efficiency of these costs.

5.8 Implications of our findings for ElectraNet's Project Delivery Cost estimate

187. We initially followed a five part process for assessing the reasonableness of the capital costs incurred by ElectraNet for its Project Delivery Costs, which included reviewing relevant materials provided by the AER, reviewing ElectraNet's responses to written Information Requests, and discussion with ElectraNet to help ensure we understood the basis for its proposed costing.

188. We have undertaken a bottom-up and top down assessment of the Project Delivery cost (overheads). The top down assessment was primarily based on reviewing the roles and the number of resources ElectraNet has deemed it requires over the ECI and D&C stages of the project for successful project delivery. For our initial bottom-up assessment we built up an alternative estimate based on our estimate of the reasonable unit costs for each of the roles in ElectraNet's Project Team structure for the ECI and D&C stages. To derive the unit costs, we applied our industry experience and the Hays 2019/20 Salary guide. Our unit cost estimates included overheads and allowances that we consider to be reasonable for the project type, complexity, location, and duration. We also reviewed the number of full-time equivalent positions designated by ElectraNet and adjusted these in cases where we considered the provision to be excessive.

189. Our conclusions from our initial assessment were that (i) ElectraNet's unit costs were likely to exceed reasonable levels for at least some roles, and (ii) the number of FTEs allocated by ElectraNet to some roles was higher than reasonably required across the two project delivery stages (i.e. ECI and D&C).

190. Subsequent to our initial assessment, ElectraNet provided additional relevant information to the AER, including its assumed unit costs for each role. We took these into account by reviewing the differences between our unit costs estimates and ElectraNet's. The revised information did not change our conclusions regarding ElectraNet's Project Delivery Cost (overheads).

191. Overall, our findings are that:

- ElectraNet's Project Team structure is suitable for the project type, scope, and complexity;
- Some unit costs appear to be greater than a reasonable amount – this is the major driver of what we consider to be the overstated Project Delivery Cost;
- The number of FTEs assumed by ElectraNet in some roles appears to be excessive;
- ElectraNet's estimate for its Project Delivery Cost (overhead) is likely to be overstated by between 25% and 35%.

192. We found no material issues with the rest of the Project Delivery Cost components.

6 PROJECT RISK ALLOWANCE

We have reviewed ElectraNet's EPRP risk allowances and based on our review of the 62 items in its risk register, including ElectraNet's updated information, we consider that ElectraNet's Risk Allowance provision is likely to be overstated by 29%.

6.1 Overview of ElectraNet's risk allowance cost

6.1.1 ElectraNet's risk allowance components

193. ElectraNet included an additional cost allowance for project risks for which it has determined there to be a degree of uncertainty. It identified and evaluated 62 individual risks.

194. In its Application, ElectraNet provided detailed assessment of project risks as one of the reasons its estimated costs had risen by $53m between the PACR and the Contingent Project Application.[48]

195. The following table shows ElectraNet's monetised residual risk value (residual probability of occurrence times the estimated financial impact if the risk event occurred) after mitigation actions. The categorisation of primary causes shown in the table is EMCa's interpretation of ElectraNet's description and consequences of the 62 risk items.

Table 6.1: ElectraNet monetised 'likely' risk values prior to 'Monte Carlo' adjustment - $k, nominal

Primary cause	Number of risks	Residual risk value	Contribution
Accident	4	[redacted]	[redacted]
COVID-19	6	[redacted]	[redacted]
Delivery delay	2	[redacted]	[redacted]
Economic	4	[redacted]	[redacted]
Environment/Heritage/Cultural	12	[redacted]	[redacted]
Legal & Regulatory	4	[redacted]	[redacted]
Technical	30	[redacted]	[redacted]
Total	62	[redacted]	100%

Source: ElectraNet-Eyre Peninsula Contingent Project_Risk Register_CONFIDENTIAL-May2020_(EMCa adjustments version)

196. The three largest contributors make up [redacted] of ElectraNet's proposed [redacted] ($nominal) likely risk value, with six COVID19-related risks representing the largest primary cause.

197. Following application of a statistical Monte Carlo simulation (discussed below), ElectraNet analysed the distribution for the range of low, likely and high risk values for the individual risks in its risk register. The result of the probabilistic risk assessment is a Risk Allowance of $19.5m ($nominal).

6.1.2 ElectraNet's project risk methodology

198. ElectraNet's description of its risk assessment process is summarised as follows: [49]

[48] ElectraNet-Eyre Peninsula Contingent Project_Application-PUBLIC-May2020, page 16

[49] ElectraNet-Eyre Peninsula Contingent Project_Application-PUBLIC-May2020, page 18

1. 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;
2. a risk management assessment was undertaken to identify appropriate mitigation measures and to quantify the probability of occurrence of the event and the financial impact of the residual risk (high, likely, and low) should the event occur - the detailed inputs to this risk assessment are determined with the relevant subject matter experts;
3. Monte Carlo Analysis was performed to simulate project risk cost outcomes on a probabilistic basis across each of the identified risks based on 50% probability of exceedance ('P50').

199. The outcome of the probabilistic risk assessment is the Risk Allowance component of the capital cost estimate.

200. The risk register containing the output from steps 1 and 2 was supplied to the AER.[50] The risk register includes ElectraNet's assessment of the probability and financial impact of the 62 project risks both prior to and following the risk mitigation treatment (i.e. the residual risk).

201. A sample of the Monte Carlo simulation results was supplied to the AER.

6.2 Our assessment

6.2.1 Our initial assessment

ElectraNet's process is reasonable

202. The methodology and process followed by ElectraNet is logical and, depending on the soundness of judgement used to determine inputs, will calculate an aggregated risk position for the EPRP.

We consider ElectraNet's assessed residual risk value to be significantly overstated

203. Identification of 62 individual risks is a high number, but not excessively so for a project of the size and complexity of the EPRP. However, in our opinion there are significant issues with ElectraNet's initial application of its risk assessment methodology, including:

- insufficient recognition of the ability for ElectraNet to manage and control the risk to a lower level than it has assumed;
- insufficient recognition of ElectraNet's ability to transfer several risks to other parties (e.g. through the D&C contract) that would reduce the residual value, if not the probability of the risk;
- not adequately recognising potential upside gains (e.g. ElectraNet includes the risk of project delays, but not for realisation of fast track opportunities);
- inclusion of risk values for risks that are inherently the same (e.g. technical issues with unknown risks, or where delays are already covered within other delay-related allowances);
- risks that are now past and will not be realised; and
- risks that are already insured against or can be insured against (such as foreign exchange hedging, insurance, contract warranties, and guarantees).

204. Subsequent to our initial review, and following the initial (virtual) workshop with ElectraNet referred to in section 2.4.2, we continued our review and assessment of each risk item in the risk register, taking into account ElectraNet's responses to information requests. Our review and assessment process included the following steps:

[50] ElectraNet-Eyre Peninsula Contingent Project_Risk Register_CONFIDENTIAL-May2020

- establish assessment criteria based on the list above; and
- apply the criteria to each of the 62 risk items, recording our rationale for adjusting either the probability of the event occurring, the quantum of the likely financial impact, or both:
  - in cases where we considered that the risk was not valid (e.g. the risk should not be attributed to ElectraNet or it no longer existed), we reduced the probability of occurrence to zero
  - where we considered that ElectraNet had overstated the likelihood of occurrence of the event, we reduced the probability value
  - where we agreed with ElectraNet's probability value, we made no change
  - similarly, we made adjustments to the ElectraNet's quantified financial residual risk in cases where we considered it to be excessive.

205. Our assessment was recorded in an extension of ElectraNet's risk register (an Excel spreadsheet), and included our assessment criteria, our rationale for each adjustment (or the reason for suggesting no adjustment), and the adjustment factors (i.e. probability of occurrence; financial impact).

206. Our initial adjustment resulted in an adjusted aggregate residual risk value of $6.7m, compared to ElectraNet's initial aggregate residual risk value of $16.1m, a reduction of $9.5m (-59%).[51] This amount does not include the result of the Monte Carlo analysis, which is described below.

6.2.2 Our revised assessment

ElectraNet provided a revised risk analysis

207. The margin between our initial assessment and ElectraNet's aggregate residual risk value is significant. This prompted the follow-up information exchange regarding the Risk Allowance described in section 2.4.3.

208. ElectraNet provided an updated version of the EMCa spreadsheet which included the following:

- a statement about the current status of the risk item (where it had changed);
- a statement that summarised its response to our adjustment;
- revised probability of occurrence and/or financial impact for each risk where it considered this to be required and consistent with its response; and
- a revised aggregate risk value of [redacted] (i.e. reduced from [redacted]).

209. ElectraNet characterised its review as comprising the following outcomes:[52]

- 1/3 of EMCa's suggested adjustments being accepted by ElectraNet;
- 1/3 of EMCa's suggested adjustments being accepted in part with ElectraNet reducing its initial probabilities of occurrence and/or financial impact settings; and
- 1/3 of EMCa's suggested adjustments rejected by ElectraNet and with it either retaining its original settings or including a material increase due to updated information.

210. ElectraNet's changes included three risk items where it had revised its original assessment upwards by[redacted]..

Our revised assessment of residual risk value is substantially higher than our initial value

211. We had the opportunity to discuss the revised spreadsheet with ElectraNet via a virtual meeting to help ensure we understood ElectraNet's approach and rationale for a representative sample of the line items.

51 Noting that rounding errors explain the apparent mismatch

52 This list was conveyed by ElectraNet as being an indicative, not precise, basis of adjustment

212. We then revisited our assessment, taking into account the additional information from ElectraNet. The results of our assessments of ElectraNet's initial and revised risk value analysis is shown in the table below.

213. Our revised assessment has resulted in our adjusted risk value increasing to [redacted] which is [redacted] or 20% lower than ElectraNet's revised value. Similar to ElectraNet's summary, we agreed with ElectraNet in the case of many risk elements because it either (i) agreed with our position, or (ii) it provided compelling updated information where we did not initially align. In some cases however, we remain of the view that ElectraNet has overstated either the probability of occurrence or the financial impact, should the event occur.

Table 6.2: Risk allowance – ElectraNet and EMCa initial and revised assessments (without Monte Carlo adjustment) - $k, nominal

Primary risk source	Number of EN-identified risks	EN initial residual risk value	EMCa adjusted residual risk value	EN revised adjusted residual risk value	EMCa revised adjusted risk value	Contribution to EMCa's adjusted total risk value
Accident	4	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
COVID-19	6	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Delivery delay	2	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Economic	4	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Environment, Heritage/Culture	12	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Legal & Regulatory	4	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Technical	30	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	62	[redacted]	[redacted]	[redacted]	[redacted]	100%

214. The Monte Carlo simulation adds complexity but potential value in assessing the range of potential simulated scenarios. Based on the resulting elevation of the risk cost value from ElectraNet's previous simulation, a similar result would increase the risk allowance we derived to [redacted]

6.3 Implications of our findings for ElectraNet's Risk Allowance cost

215. We have reviewed ElectraNet's proposed $19.5m risk allowance by testing ElectraNet's rationale for the input assumptions for each of the 62 risks it identified and recorded in its risk register.

216. Our review process included consideration of relevant materials provided by the AER, reviewing ElectraNet's responses to written Information Requests, and discussion with ElectraNet to help ensure we understood the basis for its proposed costing.

217. We developed assessment criteria which we applied to test the reasonableness of (i) ElectraNet's assumed probability that the risk event would occur, and (ii) ElectraNet's assumed financial impact, should the event occur.

218. We undertook an initial and subsequent assessment, with the latter applying updated information provided by ElectraNet via the AER and following further discussions with ElectraNet to help ensure we understood the basis for its updated risk costs.

219. As a result of our assessment, EMCa considers that a prudent and efficient Risk Allowance for the EPRP is [redacted] or approximately 5% of the project cost. This is slightly lower than ElectraNet's estimate of 7%.