

# Draft Decision

## ElectraNet Transmission Determination 2023 to 2028

(1 July 2023 to 30 June 2028)

### Attachment 5 Capital expenditure

September 2022

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#### **Amendment record**

<b>Version</b>	<b>Date</b>	<b>Pages</b>
Version 1	30 September 2022	36

## Note

This attachment forms part of the AER’s draft decision on ElectraNet’s 2023–28 transmission determination. It should be read with all other parts of the draft decision.

The draft decision includes the following documents:

Overview

Attachment 1 – Maximum allowed revenue

Attachment 2 – Regulatory asset base

Attachment 3 – Rate of return

Attachment 4 – Regulatory depreciation

Attachment 5 – Capital expenditure

Attachment 6 – Operating expenditure

Attachment 7 – Corporate income tax

Attachment 8 – Efficiency benefit sharing scheme

Attachment 9 – Capital expenditure sharing scheme

Attachment 10 – Service target performance incentive scheme

Attachment 11 – Demand management innovation allowance mechanism

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## 5 Capital expenditure

Capital expenditure (capex) refers to the investment made in the transmission network to provide prescribed transmission services. This investment mostly relates to assets with long lives (30-50 years is typical) and these costs are recovered over several regulatory periods. On an annual basis, the financing and depreciation costs associated with these assets are recovered (return of and on capital) as part of the building blocks that form ElectraNet's total revenue requirement.<sup>1</sup>

Under the regulatory framework, ElectraNet must include a total forecast of the capex that it considers is required to meet or manage expected demand, maintain the safety, reliability, quality, security of its network or comply with all applicable regulations (the capex objectives).

ElectraNet has proposed \$696 million (\$2022–23) in forecast capex that it considers is required to maintain the safety, reliability and security of energy supply on its network in the 2023–28 regulatory control period. This forecast capex is primarily for the replacement of assets that are reaching the end of their life, and infrastructure that supports the delivery of electricity transmission services.

We must decide whether we are satisfied that ElectraNet's forecast reasonably reflects prudent and efficient costs to maintain the safety, reliability and security of the network, and a realistic expectation of future demand and cost inputs (the capex criteria). We must make our decision in a manner that will, or is likely to, deliver efficient outcomes that benefit consumers in the long term (as required under the National Electricity Objective).

If we are not satisfied, we must set out the reasons for this decision and a substitute estimate of the total capex for the regulatory control period that we are satisfied reasonably reflects the capex criteria, taking into account the capex factors.

This attachment sets out our draft decision on ElectraNet's forecast capex.

### 5.1 Draft decision

Our draft decision is that we are satisfied that ElectraNet's forecast capex of \$696 million<sup>2</sup> (\$2022–23) reasonably reflects prudent and efficient costs to maintain the safety, reliability, and security of the network.<sup>3</sup> Table 5.1 sets out our draft decision on ElectraNet's proposed capex for the 2023–28 regulatory control period.

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<sup>1</sup> NER, cl. 6A.5.4(a).

<sup>2</sup> In response to an information request regarding ElectraNet's 'Wide area monitoring' program, ElectraNet has removed one Phasor Measurement Unit site from its program of works. See section 5.3.2 – Security and Compliance. ElectraNet's capex forecast is now \$695.7 million (\$2022–23), compared to the \$696 million (\$2022–23) initially proposed on 31 January 2022. ElectraNet provided an updated capex model to reflect this adjustment to its proposed capex forecast. AER, *information request #15*, dated 23 May 2022.

<sup>3</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 26.

**Table 5.1 Draft decision on ElectraNet’s total forecast capex (\$million 2022-23)**

	2022–23	2023–24	2024–25	2025–26	2026–27	Total
AER draft decision	152	156	140	133	115	696

Source: AER analysis, *ElectraNet, Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 26.

Note: Numbers may not add up due to rounding.

We do not approve a particular category of capex or specific projects, but rather an overall amount. However, as part of our assessment, we do review categories of expenditure and particular projects to test whether ElectraNet’s proposed total forecast capex reasonably reflects the capex criteria.

While we have accepted ElectraNet’s total capex forecast and are broadly supportive of ElectraNet’s forecasting approach, which accords with our 2019 *Industry Practice application note for asset replacement planning*, we have identified a couple of modelling improvements to the replacement capital expenditure forecast that should be considered by ElectraNet and Transmission Network Service Providers (TNSP’s) more broadly, when undertaking the economic modelling. This is considered further in the replacement and refurbishment section 5.3.1 below.

## 5.2 ElectraNet’s proposal

ElectraNet’s proposal forecasts \$696 million (\$2022-23) capex over the 2023–28 regulatory period.<sup>4</sup> This represents a decrease of approximately 51 per cent compared to actual and expected expenditure over the current period.<sup>5</sup>

ElectraNet’s forecast capex is lower than it was in any of the previous three periods when its contingent projects, Project EnergyConnect and the Main Grid System Strength projects, are excluded.<sup>6</sup>

ElectraNet’s proposed capex decrease largely reflects:<sup>7</sup>

- 39 per cent reduction in replacement expenditure,
- 27 per cent reduction in refurbishment expenditure, and
- 38 per cent reduction in security/compliance expenditure.

Figure 5.1 outlines ElectraNet’s historical capex trend, its proposed forecast for the 2023–28 regulatory control period, and our draft decision. The significant uplift in forecast/estimated capex in 2021–22 and 2022–23, arises from the inclusion of two large projects identified by

<sup>4</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 26.

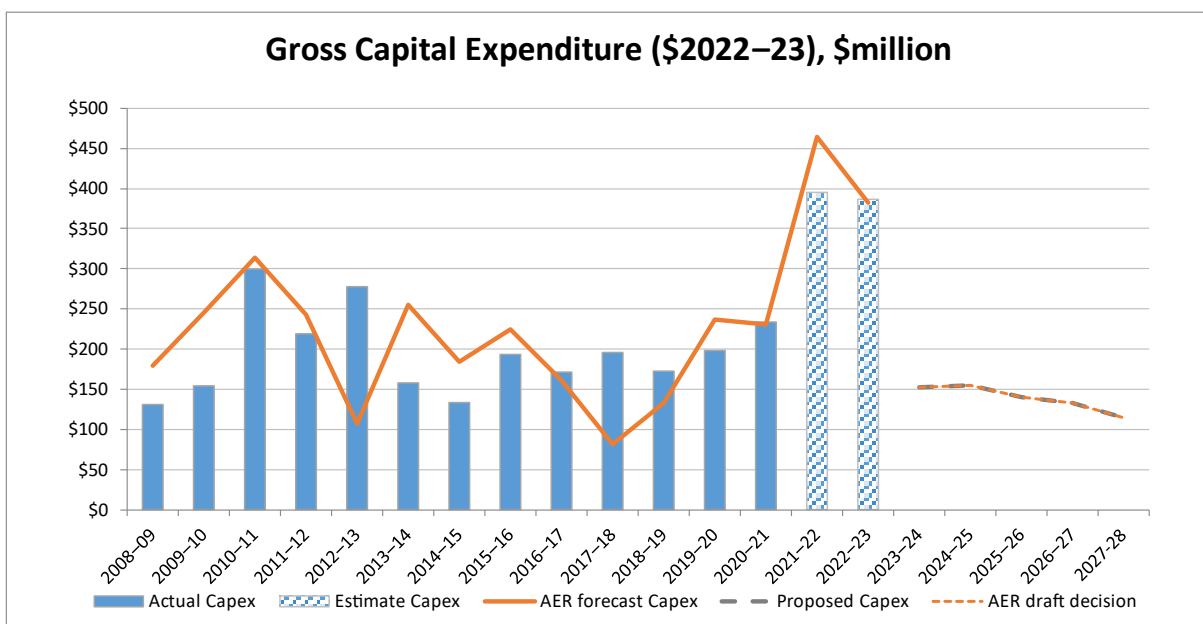
<sup>5</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 27.

<sup>6</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, (Figure 5-7), 31 January 2022, p. 24.

<sup>7</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 27.

AEMO in its 2018 ISP report.<sup>8</sup> The capex for these projects included \$166 million for Main Grid System Strength<sup>9</sup> and \$457 million for Project EnergyConnect (PEC)<sup>10</sup> at the time, demonstrating the ‘lumpiness’ of transmission expenditure.

**Figure 5.1 ElectraNet’s historical vs forecast capex (\$2022–23, million)**



Source: AER final decision PTRM and RFM for previous regulatory periods, including updates for appeals; ElectraNet, ENET023 - ElectraNet - PTRM 2023–28, 31 January 2022; ElectraNet 2024-28 Reset RIN submissions; AER analysis.

Table 5.2 provides ElectraNet’s breakdown of its capex proposal in more detail. The majority of forecast capex is for replacement of assets (\$327 million or 47%), with an additional \$67 million or 10% for refurbishment.<sup>11</sup> The next largest capex category is security and compliance (\$168 million or 24%), followed by augmentation \$59 million (8%), and information technology \$43 million (6%).

<sup>8</sup> AEMO *Integrated System Plan*, July 2018, p. 83 (Group 1, SA system strength remediation) and p. 87 (Group 2, Riverlink, SA to NSW upgrade).

<sup>9</sup> AER, Final Decision, *ElectraNet Contingent Project - Main Grid System Strength*, August 2019, p. 31.

<sup>10</sup> AER, Final Decision, *ElectraNet Contingent Project - Project EnergyConnect*, May 2021, p. 1.

<sup>11</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 26.

**Table 5.2 Draft decision on ElectraNet’s total forecast transmission capex (\$million 2022-23)**

Category	Forecast capex (\$2022–23)	Proportion of total	Change from 2018–23 (\$2022–23)	Change from 2018–23 (%)
Augmentation	59	8.5%	-348	-85.5%
Connection	0	0.0%	-3	-100.0%
Easement/land	6	0.9%	0	0.0%
Replacement	327	47.0%	-211	-39.3%
Refurbishment	67	9.6%	-25	-26.4%
Security/Compliance	168	24.1%	-100	-37.5%
Information Technology	43	6.2%	-36	-46.3%
Inventory/spares	12	1.7%	-1	-7.7%
Facilities	14	2.0%	2	16.7%
<b>Total</b>	<b>696</b>	<b>100.0%</b>	<b>-723</b>	<b>-51.0%</b>

Source: AER analysis; ElectraNet, *ENET007 - ElectraNet - Attachment 5 - Capital expenditure*, 31 January 2022, p. 27.

Note: Numbers may not add up due to rounding.

ElectraNet’s capex forecast consists of:<sup>12</sup>

- Replacement and refurbishment – \$394 million<sup>13</sup> or 57% of the capex is for the replacement and refurbishment of deteriorating high risk assets. The replacement capex is driven by the ongoing need to manage safety, security and reliability risks associated with ageing assets. The forecast capex reflects a reduced requirement for the replacement of assets following the completion of the major Eyre Peninsula line replacement in the current period.<sup>14</sup> The forecast refurbishment capex is for the ongoing works to extend the useful life of ageing transmission lines and managing network safety, security, reliability and fire start risks
- Security and safety – \$168 million or 24% of the capex is for the physical and cyber security of its network, to maintain public safety and security of supply, driven by changes to Commonwealth legislation and other factors.<sup>15</sup> ElectraNet considers this capex will contribute to the lowest long-term cost outcomes, with a reduced expenditure requirement following the installation of synchronous condensers in the current period

<sup>12</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, pp. 7–29.

<sup>13</sup> AER analysis; ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, pp. 27–28.

<sup>14</sup> AER analysis; ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 27.

<sup>15</sup> AER analysis; ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 27.



- Augmentation – \$59 million or 8% of the capex is for the completion of Project EnergyConnect (PEC<sup>16</sup>) project.<sup>17</sup> PEC is expected to be completed several months later than originally planned, which delays the final stages of construction from the current regulatory period into the next period.<sup>18</sup> There is minimal new load driven capex requirements in the current declining demand environment
- Technology and systems – \$43 million<sup>19</sup> or 6% of the capex is to support the ongoing uptake of renewable energy, both grid scale and distributed, and to harness new technologies
- Other – the remaining 5 per cent of total capex comprises minor strategic land acquisitions, inventory/spares and facilities capex.

ElectraNet’s proposal also includes three proposed contingent projects with a total indicative cost of \$180–\$360 million (\$nominal):

- Interconnector Upgrade - \$100–150 million: increase in inter-regional transfer capacity through such measures as control schemes and/ or frequency response capability
- Eyre Peninsula Upgrade - \$50–150 million: upgrade of the northern section of the Eyre Peninsula line from 132 kV to 275 kV to serve higher loads, which is accommodated in the design and/or augmentation of power transfer capacity between Davenport and Cultana
- Power Quality Management - \$30–60 million: installation of the relevant equipment to maintain power quality standards across the transmission network in relation to voltage harmonic requirements.

A contingent project is a significant network augmentation project that may be required during the regulatory period but for which the need, timing and costs are currently uncertain. The expenditure for such projects does not form part of the total forecast capex that we will approve in this revenue determination. But, if certain conditions (project-specific ‘trigger events’) are met, ElectraNet may apply to us to amend the determination to include the incremental revenue required to undertake the project.

We have assessed whether ElectraNet’s proposed trigger events are appropriate. We have amended the wording of the trigger events, where necessary, to ensure these are reasonably specific, verifiable and consistent across our determinations.

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<sup>16</sup> AER, Final Decision, *ElectraNet Contingent Project - Project EnergyConnect*, May 2021, p. 1.

<sup>17</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 27; AER analysis.

<sup>18</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 20.

<sup>19</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 27; AER analysis.

Additional actionable ISP projects or system strength projects may arise during the regulatory period as part of AEMO’s ISP process,<sup>20</sup> which while not requiring a decision from us as part of this review, can also be classified as contingent projects under the rules.<sup>21</sup>

### 5.3 Reasons for draft decision

Based on our economic and technical review of the capex projects proposed by ElectraNet, we are satisfied that total forecast capex of \$696 million (\$2022–23) in the 2023–28 regulatory control period reasonably reflects the capex criteria.<sup>22</sup> We consider this provides ElectraNet with a reasonable opportunity to recover at least the efficient costs it incurs in providing direct control network services.<sup>23</sup>

Our role is to ensure that ElectraNet’s forecast capex for the 2023–28 period is consistent with the capex criteria; efficiency, prudence and a realistic expectation of the demand forecast, and cost inputs required to achieve the capex objectives under the rules.

We reviewed ElectraNet’s capex drivers, programs and projects to inform our view on a total capex forecast that reasonably reflects the capex criteria. We conducted top-down analysis such as examining trends and forecast costs compared with historical capex, and inter-relationships between cost categories.

From a top-down perspective, ElectraNet’s capex is trending downwards. As shown above in Figure 5.1, ElectraNet is proposing a 51 per cent decrease in capex compared to capex incurred (or expected to be incurred) in the current regulatory control period. ElectraNet’s proposed capex is also 37 per cent lower than the average actual capex incurred (and expected to be incurred) over the past three regulatory control periods from 2008–09.<sup>24</sup>

To complement the top-down analysis, we conducted bottom-up analysis of ElectraNet’s major replacement and security and compliance programs and projects which make up over 70 per cent of ElectraNet’s proposal capex forecast.

Our assessment included a number of information requests to ElectraNet to obtain more detailed cost estimates and an understanding as to the basis of the capex forecasts.<sup>25</sup> ElectraNet provided economic assessment spreadsheets, which compare the relative costs and benefits and compute the net benefit (in NPV terms), for most projects except for the

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<sup>20</sup> The 2022 ISP was released in June 2022 and includes ‘actionable ISP’ projects. The ISP will then be further updated in 2024 during ElectraNet’s 2023–28 regulatory control period.

<sup>21</sup> A contingent project is either proposed by the network service providers and determined by us to be included in the revenue determination (NER, cl. 6A.8.A1(a)) and/or actionable ISP projects for which the trigger event under clause 5.16A.5 of the NER has occurred (NER, cl. 6A.8.A1(b)).

<sup>22</sup> NER, cl. 6A.6.7(c).

<sup>23</sup> NEL, ss. 7A(2) and 16.

<sup>24</sup> AER final decision PTRM and RFM for previous regulatory periods, including updates for appeals; ElectraNet, *ENET023 - ElectraNet - PTRM 2023–28*, 31 January 2022 and *ElectraNet 2024–28 Reset RIN*, and AER analysis.

<sup>25</sup> ElectraNet, *Information request #1*, dated 18 February 2022; *Information request #5*, dated 25 March 2022 and *Information request #15*, dated 23 May 2022.

Wide Area Monitoring Scheme (or Phasor Measuring Units (PMUs)) project<sup>26</sup> which is to be undertaken at AEMO’s direction.<sup>27</sup>

ElectraNet’s capex forecast adopts an economic risk-based methodology to determine the investment needed to maintain the safety, reliability and security of electricity supply on its network. This methodology was a focus of our review as it determines whether ElectraNet has identified the projects and required work that is prudent to maintain the network.

We found that ElectraNet has adopted a prudent methodology that ensures that its capital investment decisions are justified with regard to all relevant costs and benefits. This approach accords with our 2019 *Industry Practice application note for asset replacement planning* in terms of the application of risk-based cost-benefit analysis, the identification of projects, and the relevant identification of the consequences of asset failure in terms of network safety, reliability and security. In this regard, it is consistent with good industry practice. However, we have identified a couple of improvements in the approach adopted by ElectraNet in the economic modelling that supports its expenditure forecasts. These are not limited to ElectraNet and we consider the industry would benefit from further consideration of the approach taken to modelling the economic benefits in support of replacement capital expenditure programs. These findings apply to ElectraNet’s forecast asset replacement and refurbishment program, which is the largest component of ElectraNet’s total capex forecast.

We consider that ElectraNet has estimated the likely realistic costs of its replacement projects and programs, and that it has an incentive to keep its cost estimates within a reasonable range.

ElectraNet’s Consumer Advisory Panel (CAP) Working Group indicated it was satisfied that ElectraNet’s risk-based systems and processes for capital planning are robust, and that reducing capital expenditure has been a focus of ElectraNet’s Revenue Proposal.<sup>28</sup>

We received two submissions on ElectraNet’s revenue proposal from the Consumer Challenge Panel, sub-panel 25 (CCP25) and the South Australian Department for Energy and Mining.

CCP25 was supportive of ElectraNet’s capex forecast and did not comment on ElectraNet’s proposed capital works program,<sup>29</sup> but did note ElectraNet would benefit from the setting of capital productivity improvement targets, particularly in the face of the challenges that will emerge over the next 10 years.<sup>30</sup>

The Department of Energy and Mining did not comment on the proposed capital expenditure programs and projects but noted the 2024–28 period sees a slower RAB growth, which

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<sup>26</sup> ElectraNet provided AEMO’s cost benefit analysis, *PMU Cost Benefit Analysis for SA region February 2022*, for the Wide Area Monitoring Scheme (PMUs) project.

<sup>27</sup> *ElectraNet, Response to AER Information Request #1 (Confidential)*, 4 March 2022, p. 5.

<sup>28</sup> ElectraNet, *Customer Engagement Outcomes Report*, 31 January 2022, p. 17.

<sup>29</sup> CCP25, *Response to ElectraNet’s proposal*, 11 May 2022, p. 7.

<sup>30</sup> CCP25, *Response to ElectraNet’s proposal*, 11 May 2022, p. 13.

focuses on refurbishment and replacement of aging assets and new investment in physical and cyber security, and includes little growth driven or augmentation expenditure.<sup>31</sup>

Both submissions did comment on contingent projects and ISP projects more broadly, noting that these contingent projects will put further pressure on transmission costs.<sup>32</sup> ElectraNet's proposed contingent projects are considered in section 5.4.

Overall, we are supportive of ElectraNet's capex forecasting approach and find that it is a reasonable basis for determining the prudent and efficient capex for the 2023–28 regulatory control period.

While we have reviewed specific projects and the underlying costs, we do not determine forecasts for individual projects or determine which programs or projects ElectraNet should or should not undertake. This is consistent with our ex-ante incentive-based regulatory framework and is often referred to as the 'capex bucket'.

Once the ex-ante capex forecast is established, there is an incentive for ElectraNet to provide services at the lowest possible cost, because the actual costs of providing services will determine its returns in the short term. If it reduces its costs, the savings are shared with consumers in future regulatory control periods. This incentive based framework recognises that ElectraNet should have the flexibility to prioritise its capex program given its circumstances in the regulatory control period and due to changes in information and technology over time.

The remainder of this section sets out our assessment of ElectraNet's proposed forecast capex components, specifically:

- section 5.3.1 – asset replacement and refurbishment
- section 5.3.2 – security and compliance
- section 5.3.3 – augmentation; and
- section 5.3.4 – non-network: information communication technology and other programs.

### **5.3.1 Replacement and refurbishment**

Replacement capital expenditure (repex) is the most significant contributor to ElectraNet's forecast capital expenditure for the 2023–28 regulatory control period. ElectraNet's forecast repex of \$327 million (\$2022–23) is \$211 million or 39 per cent lower than the actual and estimated repex in the current regulatory period.<sup>33</sup>

Replacement expenditure is driven by the ongoing need to manage safety, security and reliability risks associated with ageing assets. The forecast capex reflects a reduced requirement for the replacement of assets following the completion of the Eyre Peninsula line replacement in the current period.

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<sup>31</sup> Government of South Australia, Department of Energy and Mining, Submission, 21 June 2022, p. 1.

<sup>32</sup> Government of South Australia, Department of Energy and Mining, Submission, 21 June 2022, p. 2; CCP25, *Response to ElectraNet's proposal*, 11 May 2022, p. 2

<sup>33</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 27.

ElectraNet’s replacement programs involve numerous programs of work to replace transmission lines, substation primary plant, secondary systems, communications equipment and other transmission system assets to maintain reliability, security and safety of supply. Replacement projects are generally undertaken to address the increased risk of plant failure due to asset age, assessed asset condition, obsolescence, or safety issues.<sup>34</sup> This includes the replacement of components such as insulators, isolators, circuit breakers, instrument transformers and telecommunication systems to support the safe and reliable operation of the transmission network.<sup>35</sup>

ElectraNet has also proposed \$67 million (\$2022–23) for asset refurbishment. This is \$25 million or 26 per cent lower than the actual and estimated refurbishment capex in the current period.<sup>36</sup> The forecast refurbishment capex reflects ongoing works to extend the useful life of ageing transmission lines and managing network safety, security, reliability and fire start risks. ElectraNet’s refurbishment capex includes line insulator systems, line conductors and earth wires and the high crossing tower climbing system.<sup>37</sup>

AEMO is also reviewing ElectraNet’s revenue proposal, for the period 1 July 2023 to 30 June 2028, at the request of the South Australian Government.<sup>38</sup> This is undertaken as part of AEMO’s additional advisory functions to Ministers on matters relevant to the future capacity and reliability of the power system.<sup>39</sup> The purpose of the review is to consider the need for each project to meet the requirements of the South Australian Electricity Transmission Code, the economic justification where the expenditure is driven by increasing market benefits and whether the transmission network is expected to meet the Electricity Transmission Code requirements for the 2023–28 regulatory period.

AEMO’s review is being completed in two stages.<sup>40</sup> Firstly an independent assessment of ElectraNet’s capital expenditure proposal for 2023–28, based on the public preliminary revenue proposal and subsequent information provided by ElectraNet, and then a further assessment before ElectraNet submits its revised revenue proposal to us in December 2022.

AEMO has completed the first stage of the review, which assessed 14 of ElectraNet’s capex project proposals.<sup>41</sup> AEMO’s first stage review determined there is an ongoing need for the equipment considered in all eight of the refurbishment and replacement projects.<sup>42</sup> AEMO considers these projects will maintain the South Australian transmission assets to an

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<sup>34</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, pp. 22–23 and 41.

<sup>35</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28*, 31 January 2022, pp. 30–31.

<sup>36</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28*, 31 January 2022, p. 29.

<sup>37</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28*, 31 January 2022, pp. 30–31; ElectraNet, *Capex model 2024–28 (Project List Tab)*, 31 January 2022.

<sup>38</sup> AEMO, *Independent planning review: ElectraNet capital expenditure proposal for 2023–28*, December 2021, p. 6.

<sup>39</sup> Section 50B of the National Electricity Law.

<sup>40</sup> AEMO, *Independent planning review: ElectraNet capital expenditure proposal for 2023-28*, December 2021, p. 6.

<sup>41</sup> AEMO, *Independent planning review: ElectraNet capital expenditure proposal for 2023-28*, December 2021, p. 4.

<sup>42</sup> AEMO, *Independent planning review: ElectraNet capital expenditure proposal for 2023-28*, December 2021, p. 4.

operational standard, and that market and network conditions will necessitate the continued use of these assets.<sup>43 44</sup>

In considering ElectraNet’s replacement and refurbishment capex forecast of \$394 million (\$2021–22), we assessed whether the underlying condition assessments, input assumptions and economic modelling were reasonable.

ElectraNet applies a risk-based approach to asset replacement decision making, driven by detailed asset condition assessment, risk, and reliability considerations, balanced against cost. This cost-risk analysis considers the probability of an asset failure, likelihood of adverse consequence; and the likely cost of the consequence.<sup>45</sup> ElectraNet’s approach balances the expected risk reduction against the costs of the proposed expenditure to ensure safety and reliability requirements are met at lowest cost.

We reviewed a number of replacement and refurbishment projects to test the veracity of ElectraNet’s proposed forecasts. We also submitted information requests in order to clarify our understanding of ElectraNet’s replacement forecasting and economic modelling.<sup>46</sup> The key projects we reviewed included:<sup>47</sup>

- Circuit Breaker Unit Asset Replacement
- Transmission Line Insulation System Replacement
- Instrument Transformer Unit Asset Replacement
- Isolator Unit Asset Replacement
- Hummocks - Ardrossan West 132kV Line Refurbishment
- Line Conductor & Earth Wire Refurbishment.

Whilst we consider ElectraNet’s models to be well developed and they generally provide a reasonable assessment of the expected benefits of the proposed investment, we have identified a couple of improvements, outlined below that ElectraNet and TNSP’s more broadly, should consider when modelling the risk-based approach to asset replacement. We expect that these enhancements would better align with our 2019 *Industry Practice application note for asset replacement planning* and are likely to achieve an improved

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<sup>43</sup> AEMO, *Independent planning review: ElectraNet capital expenditure proposal for 2023-28*, December 2021, p. 4.

<sup>44</sup> AEMO’s review has been prepared by using information available as of 17 November 2021 and does not provide advice on the condition of ElectraNet’s assets or their refurbishment or replacement decisions. These projects were assessed on the premise that the relevant poor asset conditions need to be addressed in the next regulatory period as advised by ElectraNet.

<sup>45</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 34.

<sup>46</sup> ElectraNet, *Information request #1*, dated 18 February 2022 and *Information request #15*, dated 23 May 2022.

<sup>47</sup> The sample of projects reviewed is \$165 million or 40% of ElectraNet’s proposed replacement and refurbishment capex.

forecasting approach for future regulatory control periods. ElectraNet has acknowledged the matters raised below.<sup>48</sup>

#### *Applying the Transmission Asset Lifecycle to economic assessments*

There is scope for an improved connection between ElectraNet’s internal condition assessment process known as the Transmission Asset Lifecycle and its economic assessment for calculating the level of replacement. This would provide stakeholders with more confidence that the consequences of asset failure are being reflected in the identified benefits for the economic modelling. The Transmission Asset Lifecycle process incorporates the categories of ‘Safety’ and ‘Capability’ in addition to ‘Condition’ to provide an overall asset health score that is then qualitatively translated into a condition age used in the economic assessment. This is used to estimate the asset condition score, the conditional age of assets and their probability of failure and has the potential to link failure modes to unrelated consequences. An example of this is the Isolator Unit Asset Replacement project where some assets which are between 18-26 years old are being modelled with a conditional age of 45 years.

#### *Application of the risks and benefits across the portfolio of assets*

In reviewing the economic modelling for the replacement projects, we identified instances where a number of assets provide the majority of the benefits that drive the replacement expenditure across the wider portfolio of assets within the proposed suite of replacement projects. This was observed where asset replacement costs were relatively uniform. In other words, the benefits attributed to a number of assets are being applied across the board to establish a work program, when viewed at the individual asset level, the benefits of which may not exceed the costs. An example of this was the Transmission Line Insulation System Replacement Project,<sup>49</sup> where the economic modelling appeared to show that the project benefits could be achieved with fewer individual projects. While bundling of works, which include more costly individual replacements, may still result in a more efficient overall programs of work, this should be reflected in the modelling.

Notwithstanding the improvements to the economic modelling that should be considered by ElectraNet and other TNSPs in undertaking future modelling in line with our *2019 Industry Practice application note for asset replacement planning*, we consider ElectraNet’s replacement and refurbishment forecast is likely to reasonably reflect its capex requirements over the next regulatory period.

Our draft decision accepts ElectraNet’s total capex forecast, including the proposed replacement and refurbishment capital expenditure of \$327 million (\$2022–23) and \$67 million (\$2022–23), respectively.

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<sup>48</sup> ElectraNet and AER staff discussions, 27 July 2022; ElectraNet, *Information request #15*, dated 23 May 2022.

<sup>49</sup> ElectraNet, *ENET062 – IR001 - EC 15233 – Transmission line insulation replacement economic assessment – 20020304 – Confidential*.

### 5.3.2 Security and compliance

ElectraNet proposed \$168 million (\$2022–23) in forecast capex for security and compliance.<sup>50</sup> This is 38 per cent (or \$100 million) lower than the amount of expenditure ElectraNet expects to incur in the current regulatory control period.<sup>51</sup> ElectraNet proposed security and compliance capex is for the physical and cyber security of its network, to maintain public safety and security of supply, driven by changes to Commonwealth legislation and other factors. ElectraNet considers this capex will contribute to lowest long-term cost outcomes, with a reduced expenditure requirement following the installation of synchronous condensers in the current period.

Similar to our assessment approach to replacement capital expenditure outlined above, in considering ElectraNet’s security and compliance capex forecast of \$168 million (\$2022–23), we assessed whether the underlying condition assessments, input assumptions and economic modelling were reasonable. We also submitted information requests in order to clarify our understanding of ElectraNet’s security and compliance forecasting and economic modelling.<sup>52</sup> We requested an individual breakdown of the cost estimates, business cases and NPV models (spreadsheets of the inputs and assumptions) demonstrating how a range of projects were selected and the benefits compared to business as usual.<sup>53</sup>

Having reviewed the cost estimates, business cases and relevant NPV models, we consider ElectraNet’s forecast security and compliance capex has been derived on a reasonable basis.

Our draft decision accepts ElectraNet’s total capex forecast, including the proposed security and compliance capex of \$168 million (\$2022–23).

This category of capex included the wide area monitoring scheme project and network power quality monitoring. These are briefly discussed below, as the wide area monitoring scheme project was amended following our review and the network power quality monitoring is in conjunction with a proposed contingent project.

The wide area monitoring scheme has been updated, with a small reduction in the cost. ElectraNet included \$12.9 million (\$2022–23) capex for wide area monitoring, which involves the installation of Phasor Measurement Units (PMUs).<sup>54</sup> The installation of PMU’s is in

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<sup>50</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 18.

<sup>51</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 27.

<sup>52</sup> ElectraNet, *Information request #1*, dated 18 February 2022 and *Information request #15*, dated 23 May 2022.

<sup>53</sup> ElectraNet, *Information request response #1*, dated 4 March 2022. Projects included, Network Voltage Control, Wide Area Monitoring Scheme, Substation Perimeter Intrusion and Motion Detection Security, Substation Security Fencing Replacement, Power Quality Monitoring Installation, Transmission Line Avian Fire-Start Risk Mitigation.

<sup>54</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 30.



accordance with a direction issued by AEMO under clause 4.11.1(d) of the NER requiring ElectraNet to install PMUs at specified locations on ElectraNet’s network.<sup>55</sup>

The project is required to be completed by 31 December 2023 and involves upgrading or replacing PMUs and installing 22 new PMUs. The PMUs will allow AEMO to discharge its market and power system security functions by remotely monitoring and investigating, current and potential, power system security issues.

We accept AEMO’s direction demonstrates there is a need to install PMUs at specified locations on ElectraNet’s network. However, we sought to clarify the scope of the projects included in ElectraNet’s proposal and undertook further analysis of the unit cost of the installation of each PMU to determine if this expenditure was efficient.<sup>56</sup>

In response to our information request, ElectraNet confirmed the AEMO direction was made after ElectraNet finalised its regulatory proposal and there are minor discrepancies between its proposal and AEMO’s direction. ElectraNet has removed one PMU site from its program of works, resulting in a small \$0.32 million reduction to the overall program.<sup>57</sup>

A network power quality remediation project was initially included in ElectraNet’s indicative ex ante capital expenditure forecast in its Preliminary Revenue Proposal. However, in consultation with its Consumer Advisory Panel, it included a reduced project in its capital expenditure program to install measurement devices and to undertake further analysis to develop a more targeted and staged solution. The smaller network power quality monitoring project (\$5 million) is included in the ex-ante capex forecast to install measuring equipment to better identify the voltage quality issues to be addressed. The more substantial network power quality remediation project is a contingent project. Our draft decision accepts this contingent project with amended triggers and is discussed further in section 5.4 below.

### 5.3.3 Augmentation

ElectraNet’s augmentation forecast of \$59 million includes expenditure in the first two years of the 2023–28 regulatory control period to allow for the completion of Project EnergyConnect. ElectraNet submitted that its updated project forecasts indicate construction of this project will be completed several months later than originally expected, which will push the final stages of construction from the current regulatory period into the next.<sup>58</sup> In June 2021, we approved contingent project applications from ElectraNet and TransGrid to provide funding for each business to undertake their portion of the works for PEC.<sup>59</sup>

Growth in customer peak demand has historically been the principal driver of transmission system augmentation and connection point reinforcement. However, in the 2023–28 regulatory period, ElectraNet submitted that demand growth is not expected to drive network investment. AEMO’s forecasts show that maximum demand in South Australia is expected to

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<sup>55</sup> AEMO, *Notice under clause 4.11.1(d) – Remote monitoring equipment*, 27 January 2022.

<sup>56</sup> AER, *Information request #15*, dated 23 May 2022.

<sup>57</sup> ElectraNet, *Response to information request #15*, dated 20 June 2022, p. 12.

<sup>58</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 27.

<sup>59</sup> AER, *Final Decision, ElectraNet Contingent Project - Project EnergyConnect*, May 2021, p. 1.

be relatively flat over the next 5 years. ElectraNet considers there is the potential for more significant increases in maximum demand in the medium to long term, but this potential growth did not affect its capital expenditure plans for the forthcoming regulatory period. ElectraNet considers that falling minimum demand levels on the network are revealing network limitations that need to be addressed. Because of minimal new load driven capital investment requirements in the declining demand environment, ElectraNet has not forecast any connection capex.<sup>60</sup>

We recognise the construction of Project EnergyConnect has been delayed and that the project will be completed during the 2023–28 regulatory control period. Although ElectraNet has not proposed any demand driven augmentation capex, we consider that ElectraNet will require \$59 million capex to complete Project EnergyConnect, consistent with our final decision to provide funding for Project EnergyConnect.<sup>61</sup>

Our draft decision also includes a corresponding deferral of Project EnergyConnect from the calculation of the capital expenditure sharing scheme carryover amount for 2018–23, so that consumers do not miss out on the benefits associated with the capex deferral.<sup>62</sup>

### 5.3.4 Non-network: Information and communication technology and other programs

The non-network capex category for ElectraNet includes expenditure on information and communications technology (ICT), facilities and for this decision easements. ICT capex includes projects to develop and maintain ICT capacity and to improve the functionality of business systems to support business operation. Facilities capex includes projects to replace and upgrade office accommodation, motor vehicles and services to meet business needs. Easements capex includes expenditure for strategic land and easement acquisitions for projected augmentation and replacement requirements.<sup>63</sup>

#### 5.3.4.1 Information and communication technology

ElectraNet has forecast \$43 million (\$2022–23) in ICT capex. ElectraNet submitted that its proposed ICT investment supports its power system security and reliability at lowest long-term cost as well as supporting efficient business operation and therefore affordability.<sup>64</sup>

ElectraNet's proposed \$43 million ICT capex is 46% lower than the ICT capex that it expects to incur in the current regulatory control period.<sup>65</sup> This reduction reflects a change in accounting standards that requires ElectraNet to report intangible assets as opex. Setting

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<sup>60</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, pp. 27, 30 and 31.

<sup>61</sup> AER, *Final Decision ElectraNet Contingent Project - Project EnergyConnect*, May 2021.

<sup>62</sup> The CESS calculation is outlined in Attachment 9 of our draft decision. Also see, AER, *Better Regulation, Capital Expenditure Incentive Guideline for Electricity Network Service Providers*, November 2013.

<sup>63</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 41.

<sup>64</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 27.

<sup>65</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 27.

aside this change in accounting standards, ElectraNet’s forecast ICT capex is still lower than the current regulatory period.<sup>66</sup>

We reviewed additional confidential information on the ICT projects, which was provided by ElectraNet in response to our information request. This additional information provided a breakdown of ICT capex into recurrent and non-recurrent ICT expenditure. ElectraNet also provided detailed cost estimates for its proposed ICT capex projects, as well as economic assessments demonstrating the benefits of the non-recurrent ICT projects.<sup>67</sup>

In addition to the information provided by ElectraNet in response to our information request, we raised further questions on ElectraNet’s proposed ICT capex program during workshops held on 25 and 26 May 2022. The focus of our review of ElectraNet’s ICT capex program was the proposed capex for the Energy Management System (EMS) upgrade. In response, ElectraNet provided additional information on the basis for the estimates of the EMS technical and functional upgrade projects.<sup>68</sup>

This included ElectraNet’s EMS vendor’s intended timing of software upgrades. ElectraNet’s EMS currently operates on Windows Server 2016 and the vendor roadmap indicates that support for this will cease in 2027. ElectraNet stated that the next version of windows will be Windows Server 2022, which has just been released. As ElectraNet’s EMS software does not operate on Windows 2022 (or any later version), an EMS upgrade will be required to coincide with the Windows upgrade. This is supported by the vendor’s roadmap. ElectraNet considers it is also reasonable to expect that a minor upgrade, such as security or software defect patching, will be required over the same timeframe.<sup>69</sup>

ElectraNet’s ICT forecast is consistent with the AER’s ICT forecasting assessment guideline to the extent that it separates recurrent and non-recurrent expenditure, with NPV analysis required only for the non-recurrent expenditure. ElectraNet conducted cost benefit analysis for its proposed non-recurrent ICT projects. Our review indicates that there are likely positive benefits for the proposed capex projects. We also consider ElectraNet’s approach and scope for its proposed EMS related projects is reasonable. For these reasons, we consider that ElectraNet’s forecast ICT capex is likely to reflect prudent and efficient costs.

The total capex forecast which we have accepted in our draft decision includes ElectraNet’s proposed ICT expenditure of \$47 million (\$2022–23).

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<sup>66</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 27.

<sup>67</sup> ElectraNet, *Response to AER Information Request #1 (Confidential)*, 4 March 2022.

<sup>68</sup> ElectraNet, *Second Response to AER Information request #15 – Capital expenditure (public) and Energy Management System Functional Enhancements Estimate (confidential)*, 20 June 2022.

<sup>69</sup> ElectraNet, *Second Response to AER Information request #15 – Capital expenditure (public)*, 20 June 2022.

### 5.3.4.2 Easements

ElectraNet has proposed strategic land acquisition capex of \$6 million.<sup>70</sup>

We requested ElectraNet to provide an explanation of the composition of the strategic land acquisition and the cost build-up for this capex category. ElectraNet’s response included a project summary setting out the basis of this project, together with an economic assessment spreadsheet.<sup>71</sup>

We have reviewed the confidential information provided in response to our information request and consider that ElectraNet has justified its proposed strategic land acquisition. We accepted ElectraNet’s proposed easements capex because:

- the forecast easements capex is similar to the current period estimate of \$6 million and significantly lower than the previous period’s \$28 million
- the project has been identified in AEMO’s 2022 ISP as a future ISP project and likely to be required in 2033–34<sup>72</sup>
- ElectraNet’s project summary of the strategic land acquisition provided details on the project description, need and benefit which we consider supports the project; and
- ElectraNet has provided a cost-build which we consider is reasonable.

The total capex forecast which we have accepted in our draft decision includes ElectraNet’s proposed easement expenditure of \$6 million (\$2022–23).

### 5.3.4.3 Other forecast non-network capex

The other non-network capex category for ElectraNet includes expenditure on facilities and inventory and spares. Facilities capex includes projects to replace and upgrade office accommodation and services to meet business needs, as well as vehicle purchases.

#### *Facilities and Vehicles*

ElectraNet has proposed \$14 million (\$2022–23) for facility upgrades and vehicle replacements capex.<sup>73</sup> ElectraNet’s actual and expected capex for the current regulatory period is \$14 million and its actual capex for the previous regulatory period was \$12 million.<sup>74</sup>

We asked ElectraNet to provide an explanation of the composition and cost-build-up of its facilities capex. In its response, ElectraNet provided a description and cost estimate of the

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<sup>70</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 12.

<sup>71</sup> ElectraNet, *Response to information request#1 – ENET158 Robertstown to Metro Corridor Early Works (confidential) and ENET159 Robertstown to Metro Corridor estimate (confidential)*, 4 March 2022.

<sup>72</sup> AEMO, *2022 Integrated System Plan for the National Electricity Market*, June 2022, p. 76.

<sup>73</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 27.

<sup>74</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 26.

nine projects that make up the facilities capex forecast.<sup>75</sup> ElectraNet’s facilities capex included motor vehicle purchases.<sup>76</sup>

We consider that ElectraNet’s proposed facilities and vehicle capex of \$14 million (\$2022–23) is reasonably likely to reflect prudent and efficient costs for the following reasons:

- the majority of ElectraNet’s facilities capex projects are driven by compliance requirements which we consider is consistent with good electricity industry practice
- forecast motor vehicle capex is consistent with ElectraNet’s capex for the current period, including the number of vehicles purchased and total fleet size
- ElectraNet’s forecast facilities capex is consistent with historical facilities capex.

The total capex forecast which we have accepted in our draft decision includes ElectraNet’s proposed facilities and vehicles expenditure of \$14 million (\$2022–23).

#### *Inventory and spares*

ElectraNet has proposed \$12 million for inventory and spares capex.<sup>77</sup> ElectraNet’s actual and expected capex for the current regulatory period is \$13 million and its actual capex for the previous regulatory period was \$16 million.<sup>78</sup>

We asked ElectraNet to provide an explanation of the composition and cost-build-up of its inventory and spares capex. In its response, ElectraNet provided a description and cost estimate.<sup>79</sup>

We consider that ElectraNet’s proposed inventory and spares capex of \$12 million (\$2022–23) is reasonably likely to reflect prudent and efficient costs for the following reasons:

- ElectraNet’s inventory and spares capex is driven by compliance requirements which we consider is consistent with good electricity industry practice
- ElectraNet’s cost build-up of its inventory and spares capex is reasonable
- ElectraNet’s forecast inventory and spares capex is consistent with historical inventory and spares capex.

The total capex forecast which we have accepted in our draft decision includes ElectraNet’s proposed inventory and spares expenditure of \$12 million (\$2022–23).

## **5.4 Contingent Projects**

Contingent projects are significant network augmentation or replacement projects that are reasonably required to be undertaken in order to achieve the capex objectives. However,

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<sup>75</sup> ElectraNet, *Response to information request #1 (confidential)*, 4 March 2022.

<sup>76</sup> ElectraNet, *Response to information request #1 (confidential)*, 4 March 2022.

<sup>77</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 27.

<sup>78</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 26.

<sup>79</sup> ElectraNet, *Response to information request #1 (confidential)*, 4 March 2022.

unlike other proposed capex projects, the need for the project within the regulatory control period and the associated costs are not sufficiently certain. Consequently, expenditure for such projects does not form a part of the total forecast capex that we approve in this determination. Such projects are linked to unique investment drivers and are triggered by defined ‘trigger events’. The occurrence of the trigger event must be probable during the relevant regulatory control period. The cost of the projects may ultimately be recovered from customers in the future if the trigger events are met.

ElectraNet has proposed three contingent projects with a total indicative cost of \$180–\$360 million (\$ nominal):

- Eyre Peninsula Upgrade – to upgrade the northern section of the Eyre Peninsula line from 132 kV to 275 kV to serve higher loads, which is accommodated in the design and/or augmentation of power transfer capacity between Davenport and Cultana (\$50–\$150 million)<sup>80</sup>
- Network Power Quality Remediation – to install equipment to maintain power quality standards across the transmission network in relation to voltage harmonic requirements (\$30–\$60 million)
- Interconnector Upgrade – to increase in inter-regional transfer capacity through such measures as control schemes and/or frequency response capability (\$100–\$150 million).

Project details and proposed trigger events for each of ElectraNet’s proposed contingent projects are considered below.

### *Eyre Peninsula Upgrade*

On 28 September 2020, we approved ElectraNet’s Eyre Peninsula reinforcement contingent project for the installation of a new 132 kV double-circuit line from Yadnarie to Port Lincoln and double-circuit line from Cultana to Yadnarie. This was initially energised at 132 kV, but capable of being operated at 275 kV in the future if required.<sup>81</sup> ElectraNet considered feedback received on its July 2021 Preliminary Revenue Proposal confirmed that proposed mining developments continue to progress on the Eyre Peninsula, with the possibility of major loads connecting to the network in the 2023–28 regulatory period. ElectraNet also submitted that additional interest has been registered by private investors and the South Australian Government to develop multiple locations on the Eyre Peninsula as hydrogen export hubs, which could potentially be of giga-watt scale.<sup>82</sup>

We considered a staged development of the Eyre Peninsula line was the most efficient option (132kV initially from Cultana to Yadnarie but with capability of operating at 275kV if

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<sup>80</sup> ElectraNet’s revenue determination for the 2018–23 period included \$74 million in capex for the refurbishment of the existing Eyre Peninsula transmission line. This was considered the minimum investment required to address the condition of the line and maintain the current reliability and security of supply. In addition to the ex-ante forecast to address the condition of the Eyre Peninsula line, we approved a contingent project for further reinforcement.

<sup>81</sup> AER, *Final Decision - ElectraNet Contingent Project Eyre Peninsula Reinforcement*, September 2020, p. 1.

<sup>82</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 44.

required as a second stage).<sup>83</sup> The Eyre Peninsula Upgrade contingent project is scoped around this second stage as the most likely solution in response to reasonably foreseeable load developments.

ElectraNet considered this project would be required if loads on the Eyre Peninsula increase and exceed the thermal capability of the Cultana 275/132 kV 200 MVA transformers.<sup>84</sup> The proposed contingent project provides for the upgrade of the northern section of the Eyre Peninsula line from 132 kV to 275 kV to serve higher loads, which is accommodated in the design and/or augmentation of power transfer capacity between Davenport and Cultana.<sup>85</sup>

ElectraNet proposed the following trigger events for this contingent project:<sup>86</sup>

1. customer commitment for additional load to connect to the transmission network causing the Cultana 275/132 kV transformers to exceed their thermal limit of 200 MW and/or causing a need for augmentation of power transfer capacity between Davenport and Cultana.
2. successful completion of a RIT-T including an assessment of credible options showing the upgrade of the 132 kV Eyre Peninsula Link to 275 kV and/or augmentation of power transfer capacity between Davenport and Cultana is the preferred option
  - a. demonstrating positive net market benefits; and/or
  - b. addressing a reliability corrective action.
3. ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules.

#### *Network Power Quality Remediation*

ElectraNet submitted that the changing nature of the power system, that is, load and generation mix, system performance characteristics and attributes such as reduced fault levels and high-speed switching power electronics has impacted overall power quality performance.<sup>87</sup> ElectraNet has obligations in NER S5.1a.6 to manage power quality, including:

- magnitude of power frequency voltage
- voltage fluctuations
- voltage harmonic or voltage notching distortion
- voltage unbalance, and

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<sup>83</sup> AER, *Final Decision - ElectraNet Contingent Project Eyre Peninsula Reinforcement*, September 2020, p. 1.

<sup>84</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 44.

<sup>85</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 38.

<sup>86</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 44.

<sup>87</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 45.

- other general rules relating to transmission system design and operation.

ElectraNet submitted that ongoing monitoring and supporting studies indicate that mitigation actions should be considered at key locations to bring power quality performance to within compliance limits. ElectraNet consider this is required to ensure appropriate levels of power quality performance in relation to voltage for all load and generation network connected customers.<sup>88</sup>

This project was initially included in ElectraNet’s indicative ex ante capital expenditure forecast in its Preliminary Revenue Proposal.<sup>89</sup> ElectraNet submitted that in its engagement with customers, it included a greatly reduced project in its capital expenditure program to install measurement devices to better identify the power quality issues to be addressed and to undertake further analysis to develop a more targeted and staged solution. This contingent project is in response to the potential solutions identified through the power quality monitoring and studies to be undertaken.<sup>90</sup>

This project allows for the installation of relevant equipment to maintain power quality standards across the transmission network in relation to voltage harmonic requirements. ElectraNet’s indicative scope is to install three harmonic filters at Mt Gunson in the far north, Monash in the Riverland and in the South East along the Heywood interconnector, with associated reactors to offset the reactive power of the filters and a 20 Mvar Static Synchronous Compensator. ElectraNet considers the project should be accepted as a contingent project because of the current uncertainty over the required size and cost of the project until investigations are complete.<sup>91</sup>

ElectraNet proposed the following trigger events for this contingent project:<sup>92</sup>

1. Successful completion of a RIT-T including an assessment of credible options showing a transmission investment is justified to address voltage quality requirements on the South Australian transmission network.
2. ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules.

#### *Interconnector upgrade*

Project EnergyConnect, a transmission interconnector connecting Robertstown in South Australia’s mid-north to Wagga Wagga in New South Wales, is expected to be commissioned in 2025.<sup>93</sup> ElectraNet submitted that Project EnergyConnect will incorporate a Special

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<sup>88</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 46.

<sup>89</sup> ElectraNet, *Preliminary Revenue Proposal 2024 – 2028*, July 2021, p. 32.

<sup>90</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 46.

<sup>91</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 46.

<sup>92</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 46.

<sup>93</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 48.



Protection Scheme to maximise power transfers across Project EnergyConnect and the Heywood interconnector whilst increasing the resilience of the South Australian network to non-credible events across either corridor. ElectraNet considers there exists the potential to further enhance the capabilities of the Special Protection Scheme increasing interstate transfers across Project EnergyConnect and Heywood interconnectors via the integration of additional battery energy storage projects to deliver additional net benefits to customers.<sup>94</sup>

ElectraNet submitted that this project would be a ‘market benefits’ project, that is, it would need to demonstrate the economic benefits to customers would outweigh the costs of the project to customers. ElectraNet noted this project is not currently being considered as part of AEMO’s draft 2022 ISP.<sup>95</sup>

ElectraNet submitted that the capital expenditure for this project would be based on a battery sized to increase the capability of the interconnector by around 100 to 150 Megawatts. ElectraNet considered the actual cost of a fully scoped solution would depend on the size of the solution and connection location, subject to the outcomes of a RIT-T and would include network and non-network option analysis and costings.<sup>96</sup>

ElectraNet proposed the following trigger events for this contingent project:<sup>97</sup>

1. Successful completion of a RIT-T with an identified need to increase the capacity of either the combined interconnector limits across Project EnergyConnect and Heywood
  - a. demonstrating positive net market benefits; and/or
  - b. addressing a reliability corrective action
2. ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules.

## 5.4.1 Assessment approach

We reviewed ElectraNet’s proposed contingent projects against the assessment criteria in the NER.<sup>98</sup> We considered whether:

- the proposed contingent project is reasonably required to be undertaken in order to achieve any of the capex objectives<sup>99</sup>

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<sup>94</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 48.

<sup>95</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 48.

<sup>96</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 48.

<sup>97</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 48.

<sup>98</sup> NER, cl. 6A.8.1.

<sup>99</sup> NER, cl. 6A.8.1(b)(1).

- the proposed contingent project capital expenditure is not otherwise provided for in the capex proposal<sup>100</sup>
- the proposed contingent project capital expenditure reasonably reflects the capex criteria, taking into account the capex factors<sup>101</sup>
- the proposed contingent project capital expenditure exceeds the defined threshold<sup>102</sup>
- the trigger events in relation to the proposed contingent project are appropriate.<sup>103</sup>

ElectraNet’s revenue proposal included a description of each contingent project, proposed trigger events, project requirement, proposed capex and demonstration of rules compliance.<sup>104</sup> For the contingent projects proposed by ElectraNet, we were concerned that the triggers were either too broad, not specifically clear and lacked sufficient detail, including network specific locations, or required further justification.

We sought additional information in respect to each proposed contingent project.<sup>105</sup> In addition to the information provided by ElectraNet in its response to our information requests, we raised further questions on ElectraNet’s proposed contingent projects during a workshop held on 25 and 26 May 2022. We further consulted with ElectraNet on the interconnector upgrade contingent project and met with ElectraNet on 2 August 2022 where ElectraNet provided an overview of the analysis undertaken to date.

Given the uncertainty about the timing and requirements for a contingent project, at this stage, we have not undertaken a detailed assessment of the costs and technical scope of the projects in detail. As part of our assessment, we reviewed whether each proposed contingent project is reasonably likely to be required in the 2023–28 regulatory control period based on the materiality and plausibility of the trigger conditions. This gives us a high-level view of whether the project is reasonably required to be undertaken in the regulatory control period in order to achieve any of the capex objectives and reflect the capex criteria.

We also considered whether the proposed trigger events for each project are appropriate. This includes having regard to the need for the trigger event:

- to be reasonably specific and capable of objective verification<sup>106</sup>
- to be a condition or event which, if it occurs, makes the project reasonably necessary in order to achieve any of the capex objectives<sup>107</sup>

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<sup>100</sup> NER, cl. 6A.8.1(b)(2)(i). Relevantly, a TNSP must include forecast capex in its revenue proposal which it considers is required in order to meet or manage expected demand for prescribed transmission services over the regulatory control period (see NER, cl. 6A.6.7(a)(1)).

<sup>101</sup> NER, cl. 6A.8.1(b)(2)(ii).

<sup>102</sup> NER, cl. 6A.8.1(b)(2)(iii).

<sup>103</sup> NER, cl. 6A.8.1(b)(4).

<sup>104</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, pp. 43–49.

<sup>105</sup> ElectraNet, *Response to information request AER IR001, Question 8 (Confidential)*, 4 March 2022 and *Response to information request AER IR005 (Public)*, 13 May 2022.

<sup>106</sup> NER, cl. 6A.8.1(c)(1).

<sup>107</sup> NER, cl. 6A.8.1(c)(2).

- to be a condition or event that generates increased costs or categories of costs that relate to a specific location rather than a condition or event that affects the transmission network as a whole<sup>108</sup>
- to be described in such terms that it is all that is required for the revenue determination to be amended<sup>109</sup>
- to be a condition or event, the occurrence of which is probable during the 2023–28 period but the inclusion of capex in relation to it (in the total forecast capex) is not appropriate because either:
  - it is not sufficiently certain that the event or condition will occur during the regulatory control period or if it may occur after that period or not at all, or
  - assuming it meets the materiality threshold, the costs associated with the event or condition are not sufficiently certain.<sup>110</sup>

## 5.4.2 Draft decision

### Eyre Peninsula Upgrade

We consider ElectraNet’s proposed Eyre Peninsula upgrade contingent project should be classified as a contingent project for the 2023–28 regulatory control period. This project may be reasonably required to be undertaken in order to maintain the quality, reliability and security of supply, or to meet or manage the expected demand for transmission services over the 2023–28 period.<sup>111</sup> Although the trigger events proposed by ElectraNet for the contingent project are generally appropriate, we consider the load and location related trigger event should be more specifically defined.

ElectraNet provided amended load related triggers that included additional transmission flow path links and addressed our concerns that the load related trigger needed to be more specifically defined.<sup>112</sup> We consider ElectraNet’s amended load related triggers are sufficiently specific and reflect the specific circumstances that would drive the need for this contingent project.

We also asked ElectraNet for evidence that the customer load in the Eyre Peninsula region to connect to the transmission network during the 2023–28 period is likely to cause the Cultana 275/132 kV transformers to exceed their thermal limit of 200 MW and/or cause a need for augmentation of power transfer capacity between Davenport and Cultana. In its response, ElectraNet provided a number of examples of potential mining and hydrogen production developments, and the increase in load that could trigger the need for the proposed augmentation to its network on Eyre Peninsula.<sup>113</sup> We consider ElectraNet has provided sufficient evidence that developments in the Eyre Peninsula region are reasonably likely in the near future, and if these developments were to occur, it is likely the increased

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<sup>108</sup> NER, cl. 6A.8.1(c)(3).

<sup>109</sup> NER, cl. 6A.8.1(c)(4).

<sup>110</sup> NER, cl. 6A.8.1(c)(5).

<sup>111</sup> NER, cl. 6A.8.1(b)(1).

<sup>112</sup> ElectraNet, *ElectraNet email response*, 16 August 2022.

<sup>113</sup> ElectraNet, *Response to information request AER IR001, Question 8 (Confidential)*, 4 March 2022.

load from these developments would be sufficient to trigger the upgrade of the northern section of the Eyre Peninsula line from 132 kV to 275 kV to serve higher loads.

Consumer Challenge Panel 25 (CCP25) submitted that although ElectraNet carefully explained that contingent and ISP projects will result in an increase in the Regulated Asset Base and will increase transmission costs, there is no specific quantitative or risk-based analysis in their proposal that could indicate the possible impact of these projects on transmission prices to consumers. CCP25 suggested that ElectraNet undertake this work and present it to their Consumer Advisory Panel (CAP).<sup>114</sup> CCP25 did not express a view on the appropriateness of ElectraNet's proposed contingent projects triggers.<sup>115</sup>

### Review of trigger events

We consider ElectraNet's Eyre Peninsula Upgrade contingent project triggers to be appropriate because they are specific and verifiable, in particular:

- the successful completion of a RIT-T process may demonstrate that a project is reasonably necessary in order to achieve the capex objectives and reasonably reflects the capex criteria
- the commitment of additional load that will require an upgrade of capacity will likely increase costs in a specific location due to additional load requiring capacity upgrades.

However, for us to be satisfied with these trigger events, we considered that the wording of the load and location related triggers should be amended by referring specifically to the connection applications from spot loads which would eliminate the possibility of organic load growth acting as a trigger event.

We consulted with ElectraNet on the wording of the load and location triggers. ElectraNet acknowledged the need to make the load and location related triggers more specific and agreed to amending the load and location related triggers.<sup>116</sup>

We are satisfied the trigger events set out below meet the NER requirements for ElectraNet's proposed Eyre Peninsula Upgrade contingent project:

1. Commitment for additional load from one or more customers to connect to the transmission network with aggregate load sufficient to cause the:
  - a) Cultana 275/132 kV transformers to exceed their thermal limit of 200 MVA; or
  - b) Whyalla Central 132/33 kV transformers to exceed their thermal limit of 120 MVA; or
  - c) Whyalla Central to Cultana 132 kV lines to exceed their thermal limit of 117 MVA; or
  - d) Cultana to Stony Point 132kV line to exceed its thermal limit of 144 MVA; or

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<sup>114</sup> CCP25 - *Advice to the AER on the 2023–28 Electricity Transmission Regulatory Revenue Proposal Response to ElectraNet's proposal*, 11 May 2022, p. 18.

<sup>115</sup> CCP25 - *Advice to the AER on the 2023–28 Electricity Transmission Regulatory Revenue Proposal Response to ElectraNet's proposal*, 11 May 2022, p. 6.

<sup>116</sup> ElectraNet, *ElectraNet email response*, 16 August 2022.

e) Davenport to Cultana 275 kV lines to exceed their thermal limit of 597 MVA.

causing a need for the upgrade of the 132 kV Eyre Peninsula Link between Cultana and Yadnarie to 275 kV and/or augmentation of power transfer capacity between Davenport and Cultana and/or Cultana and Whyalla and/or Cultana and Stony Point.

2. AER is satisfied that ElectraNet has successfully completed a RIT-T, including an assessment of credible options, showing the upgrade of the 132 kV Eyre Peninsula Link between Cultana and Yadnarie to 275 kV and/or augmentation of power transfer capacity between Davenport and Cultana and/or between Cultana and Whyalla and/or Cultana and Stony Point is the preferred option:
  - a) demonstrating positive net market benefits; and/or
  - b) addressing a reliability corrective action.
3. ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules.

### **Network Power Quality Remediation**

We consider ElectraNet’s proposed Network Power Quality Remediation contingent project should be classified as a contingent project for the 2023–28 regulatory control period. This project may be reasonably required to be undertaken in order to maintain the quality, reliability and security of supply, or to meet or manage the expected demand for transmission services over the 2023–28 regulatory control period.<sup>117</sup>

ElectraNet proposed the following trigger event for this contingent project:<sup>118</sup>

1. Successful completion of a RIT-T including an assessment of credible options showing a transmission investment is justified to address voltage quality requirements on the South Australian transmission network.

Although we consider the proposed trigger of a successful completion of a RIT-T, including an assessment of credible options showing a transmission investment is justified to address voltage quality requirements on the South Australian transmission network as appropriate, we asked ElectraNet for a detailed description of the requirement for this project with respect to specific power quality obligations. We requested ElectraNet identify, where possible, specific network locations where specific power quality obligations are not, or are unlikely to be, met including the likely cause(s) for any non-compliance.<sup>119</sup>

On the information currently available, ElectraNet has concerns with the harmonic voltage distortions in the Upper North, South East and the Riverland. ElectraNet requires further

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<sup>117</sup> NER, cl. 6A.8.1(b)(1).

<sup>118</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 46.

<sup>119</sup> AER, *Information request IR#005*, 25 March 2022.

accurate measurement data to confirm these concerns, investigate the underlying causes and determine the appropriate responses.<sup>120</sup>

CCP25 supported ElectraNet’s approach to addressing network power quality in response to consumer engagement because ElectraNet will install measuring devices to better identify the issues to be addressed and develop a more targeted and staged solution, rather than making a large investment as part of its Revenue Proposal.<sup>121</sup>

### Review of trigger events

We consider ElectraNet’s Network Power Quality Remediation contingent project trigger events to be appropriate because they are specific and verifiable, in particular:

- the successful completion of a RIT-T process may demonstrate that a project is reasonably necessary in order to achieve the capex objectives and reasonably reflects the capex criteria
- the installation of relevant voltage harmonic monitoring equipment is likely to be required to maintain power quality standards across the transmission network.

However, for us to be satisfied with these trigger events, we considered that the wording of the voltage quality and location related triggers should be amended by referring specifically to the power quality standards required in the NER and location on ElectraNet’s transmission network. We also required ElectraNet to include a trigger to demonstrate that the voltage harmonic distortion causing a breach of the voltage quality standard as required by NER clause S5.1a.6 can be attributed to the transmission network rather than to one or more Network Users or to a Distribution Network Service Provider.

We consulted with ElectraNet on the wording of the triggers. ElectraNet acknowledged the need to make the triggers more specific and agreed to amend its proposed triggers.<sup>122</sup> We are satisfied that the trigger events set out below meet the NER requirements for ElectraNet’s proposed Network Power Quality Remediation contingent project:

1. ElectraNet obtains measurements that demonstrate the voltage harmonics at any one or more of the sites listed below exceed those specified by their planning levels under NER cl. S5.1a.6 in accordance with electromagnetic compatibility standard AS/NZS IEC 61000.3.6:2012:
  1. South East
  2. Taillem Bend
  3. North West Bend
  4. Monash

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<sup>120</sup> ElectraNet, *Response to AER Information request #5 – Contingent Projects (Public)*, 13 May 2022.

<sup>121</sup> CCP25 - *Advice to the AER on the 2023–28 Electricity Transmission Regulatory Revenue Proposal Response to ElectraNet’s proposal*, 11 May 2022, p. 12.

<sup>122</sup> ElectraNet, *ElectraNet email response*, 16 August 2022.

5. Mount Gunson
6. Pimba
2. ElectraNet demonstrates that the voltage harmonic distortion causing the planning levels under NER cl. S5.1a.6 to be breached can be attributed to the extent practicable to the transmission network rather than to one or more Network Users or to a Distribution Network Service Provider.
3. AER is satisfied that ElectraNet has successfully completed a RIT-T that demonstrates that the proposed network investment is the most efficient option to ensure that voltage waveform distortion planning levels at the sites at which voltage harmonics exceeded specifications as referred to in clause 1 above are not exceeded.
4. ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the NER.

### Interconnector upgrade

We consider ElectraNet’s proposed Interconnector Upgrade contingent project should not be classified as a contingent project for the 2023–28 regulatory control period. We do not consider this project may be reasonably required to be undertaken to maintain the quality, reliability and security of supply, or to meet or manage the expected demand for transmission services over the 2023–28 period.<sup>123</sup>

Whilst we acknowledge that ElectraNet’s proposed triggers for this contingent project includes a successful completion of a RIT-T, we do not consider that the proposed contingent project is likely to be required during the 2023–28 regulatory control period. We do not consider that the project is probable during the 2023–28 period because ElectraNet has not demonstrated the need for the project before 2028.

We asked ElectraNet for further information on its proposed Interconnector Upgrade contingent project, including:<sup>124</sup>

- evidence that there are current capacity limits at the Heywood Interconnector, or likely capacity limits at the PEC interconnector, to justify additional battery energy storage for this project of between 100 to 150 MW to increase interconnector limits
- whether ElectraNet considered including a trigger event that relates to a specific and measurable capacity constraint identified at the Interconnector
- whether ElectraNet can estimate the required increased capacity of either the Heywood or Project EnergyConnect interconnectors to provide a positive net market benefit for this project.

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<sup>123</sup> NER, cl. 6A.8.1(b)(1).

<sup>124</sup> AER, *Information request IR#001*, 18 February 2022.

Based on ElectraNet’s response,<sup>125</sup> we sought further information from ElectraNet, including:<sup>126</sup>

- a detailed description of the requirement for this project with respect to the capital expenditure objectives. We asked ElectraNet to identify the specific network location(s) associated with the project and how the proposed scope of the contingent project would address the identified need
- additional details regarding the proposed scope of the contingent project, including details about where a battery would be located, the indicative capacity and how it would address the identified need.

We also met with ElectraNet on 2 August 2022 to discuss ElectraNet’s proposed Interconnector Upgrade contingent project, at which time ElectraNet presented an overview of the analysis undertaken to date for this project.

### Review of trigger events

We do not consider the proposed trigger to increase the capacity of either the combined interconnector limits across Project EnergyConnect and Heywood is probable during the 2023–28 regulatory control period because:

- ElectraNet has not provided sufficient evidence demonstrating the need for this project during the 2023–2028 period
- ElectraNet’s proposed Interconnector Upgrade contingent project was not included in the optimal development path in AEMO’s 2022 ISP<sup>127</sup>
- AEMO considered the power transfer between South Australia and NSW needs to be monitored and reviewed in order to inform the case for an upgrade to Project EnergyConnect
- the commissioning of Project EnergyConnect has been delayed until 2025.<sup>128</sup>

AEMO’s 2022 ISP identified new transmission projects in the optimal development path to connect new generation and storage opportunities through the NEM to 2050.<sup>129</sup> The optimal development path identifies projects that are actionable now as well as in the future. These projects are categorised as:<sup>130</sup>

- committed and anticipated projects already underway
- actionable projects, for which work should commence at the earliest planned time; and

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<sup>125</sup> ElectraNet, *ElectraNet email response (Confidential)*, 4 March 2022.

<sup>126</sup> AER, *Information Request IR#005*, 25 March 2022.

<sup>127</sup> AEMO, *2022 Integrated System Plan*, June 2022, p. 13.

<sup>128</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 48.

<sup>129</sup> AEMO, *2022 Integrated System Plan*, June 2022, p. 12.

<sup>130</sup> AEMO, *2022 Integrated System Plan*, June 2022, p. 12.



- future ISP projects, which may include the need for the TNSP to undertake preparatory works or REZ (Renewable Energy Zone) Design Reports to enable more detailed consideration in the next ISP.

AEMO’s 2022 ISP lists network projects in the optimal development path. There were no network projects listed for the committed and anticipated projects already underway or actionable projects categories in South Australia. The future ISP projects category included two projects in South Australia, the South East South Australia REZ Expansion and Mid North SA REZ Expansion.<sup>131</sup> Neither of these two future ISP projects are directly related to ElectraNet’s proposed Interconnector Upgrade contingent project. The 2022 ISP does not include ElectraNet’s proposed Interconnector Upgrade contingent project as a transmission project in the optimal development path to connect new generation and storage opportunities through the NEM to 2050.

In its independent planning review for transmission in South Australia, AEMO confirmed that it is not currently considering a project of this nature for the 2022 ISP. AEMO did, however, consider that power transfer between South Australia and NSW needs to be monitored and reviewed in order to inform the case for an upgrade to Project EnergyConnect.<sup>132</sup> AEMO also stated in its planning review that if the project becomes an actionable ISP project, it considers the contingent project classification may not be required for an actionable ISP project and that those projects may be covered separately under the new NER 5.16A.5.<sup>133</sup>

We also considered ElectraNet’s proposal and responses to our information requests and information provided at our meeting with ElectraNet on 2 August 2022. Although ElectraNet’s responses to our information requests provided congestion forecasts, including capacity limits at Heywood and Project EnergyConnect, ElectraNet acknowledged further assessment and evaluation is required. ElectraNet considered the application of a RIT-T is required before detailed information is available on the likely size, location and benefits to be delivered by a potential transmission investment to provide greater interconnector transfer capacity.<sup>134</sup> ElectraNet also acknowledged that this contingent project anticipates a potential need to respond to the forecast congestion through the investigation of options that may deliver net benefits for customers.<sup>135</sup>

Based on the information provided by ElectraNet, we do not consider ElectraNet has demonstrated that this project is reasonably required to be undertaken during the 2023–28 regulatory control period. Whilst we acknowledge that there may be some combined interconnector transfer constraint limits across both Heywood and Project EnergyConnect, once Project EnergyConnect is commissioned, we do not consider this project is probable during 2023–28. We consider further assessment and evaluation is required on the likely size, location, and benefits to justify greater interconnector transfer capacity. AEMO endorsed the need to monitor and review power transfer between South Australia and NSW

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<sup>131</sup> AEMO, *2022 Integrated System Plan*, June 2022, p. 13.

<sup>132</sup> AEMO, *Independent planning review – ElectraNet capital expenditure proposal for 2023-28*, December 2021, p. 17.

<sup>133</sup> AEMO, *Independent planning review – ElectraNet capital expenditure proposal for 2023-28*, December 2021, p. 17.

<sup>134</sup> ElectraNet, *Response to AER Information request #5 – Contingent Projects (Public)*, 13 May 2022.

<sup>135</sup> ElectraNet, *Response to AER Information request #5 – Contingent Projects (Public)*, 13 May 2022.

in order to inform the case for an upgrade to Project EnergyConnect. Monitoring the need for an interconnector upgrade will require completion of interconnector projects so that network and market operational practices can be established along with any market benefits from interconnector upgrades.

However, whilst we do not consider the proposed Interconnector Upgrade contingent project is sufficiently certain during the 2023–28 regulatory control period, we consider there is also an effective mechanism to manage interconnector upgrade projects such as that proposed by ElectraNet. We consider AEMO’s ISP process would be an effective way of dealing with significant projects of this nature that require a high degree of integrated planning, which is a key objective of the ISP. The ISP process is transparent with AEMO, as the network planner, undertaking analysis across the NEM, to justify the need for an interconnector upgrade to be included as a transmission project in the optimal development path.

## 5.5 Ex-post statement of efficiency

We are required to provide a statement on whether the roll forward of the regulatory asset base from the previous period contributes to the achievement of the capital expenditure incentive objective.<sup>136</sup> The capital expenditure incentive objective is to ensure that where the regulatory asset base is subject to adjustment in accordance with the NER, only expenditure that reasonably reflects the capex criteria is included in any increase in value of the regulatory asset base.<sup>137</sup>

The ex post review period does not align with the regulatory control period over which a capex forecast allowance is provided. We have reviewed ElectraNet’s capex performance for the 2016–17 to 2020–21 regulatory years. This assessment has considered ElectraNet’s out-turn capex relative to the regulatory allowance given the incentive properties of the regulatory regime for a transmission business to minimise costs.

Where ElectraNet has spent more than its capex allowance for these years, we can review the efficiency of this overspend and make a determination on the capex that should be rolled into the RAB.

Table 5.3 shows ElectraNet’s actual net capex against the forecast regulatory allowance for this period, including the three years of the ex post review period. This shows that ElectraNet has spent more than its capex allowance.

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<sup>136</sup> NER, cl. 6A.14.2(b).

<sup>137</sup> NER, cl. 6A.5A(a).

**Table 5.3 ElectraNet’s actual net capex versus capex allowance – 2019–23 regulatory control period (\$million, nominal)**

	2016–17	2017–18	2018–19	2019–20	2020–21	Total
Total net capex allowance	140.4	74.7	121.6	221.9	217.3	775.9
Total net actual capex	151.4	193.3	157.2	179.0	211.2	892.0
Capex overspend / (underspend)	11.0	118.6	35.6	-42.9	-6.1	116.2

Source: ElectraNet, *Revenue Proposal 2023-24 to 2027-28*, 31 January 2022, AER.

Our analysis of ElectraNet’s capex during 2017-21 shows that ElectraNet has overspent its forecast net capex allowance by \$116.2 million (\$nominal) (15 per cent). This is driven by a large overspend in 2017–18.

In its regulatory proposal, ElectraNet submitted that:<sup>138</sup>

While we note that our capital expenditure in the period from 2017 to 2021 exceeded the sum of the annual allowances in those years by approximately 15%, this is not a systemic overspend, but purely a timing issue.

ElectraNet also submitted that its actual/expected capex in both the previous and current regulatory periods is lower than the AER’s allowance.<sup>139</sup>

We also reviewed ElectraNet’s historical capital expenditure and allowance for the 10-year period 2014 to 2023. Over this period, ElectraNet is estimated to have underspent its capex allowance by 2.4%.<sup>140</sup> This illustrates the uncertainty of the timing of transmission capex projects and the impact this timing has when comparing actual and forecast capex over any given five-year period. We do not consider that ElectraNet’s overspend for the 2016–17 to 2020–21 regulatory years suggests a systemic inefficiency of ElectraNet’s capex.

Based on our analysis, we consider that ElectraNet’s total actual capex for the ex post review period is likely to reasonably reflect the capex criteria. We are therefore satisfied that including this actual capex in the RAB is likely to contribute towards achieving the capital expenditure incentive objective.<sup>141</sup>

<sup>138</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 28.

<sup>139</sup> ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 28.

<sup>140</sup> AER analysis; ElectraNet, *Revenue Proposal 2023-24 to 2027-28, Attachment 5: Capital Expenditure*, 31 January 2022, p. 28.

<sup>141</sup> NER, cl. 6A.14.2(b).

## Glossary

Term	Definition
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
Capex	Capital expenditure
ISP	AEMO's Integrated System Plan
kV	kilovolt
MVA	megavolt-amperes
Mvar	mega volt amps (reactive)
MW	megawatt
NER	National Electricity Rules
PEC	Project EnergyConnect
PMU	Phasor Measurement Unit
PTRM	Post-Tax Revenue Model
RAB	Regulated Asset Base
Repex	Replacement capex
RFM	Roll Forward Model
RIT-T	Regulatory investment test for transmission
TNSP	Transmission network service provider