FINAL DECISION
TransGrid
Contingent Project

Victoria-New South Wales Interconnector (VNI) Minor Upgrade

April 2021

AUSTRALIAN ENERGY REGULATOR

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Contents

Shortened forms

Shortened form	Extended form
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
the application	the contingent project application TransGrid submitted to the AER in November 2020 for the VNI minor project
capex	capital expenditure
GHD	GHD Advisory
MAR	maximum allowed revenue
NEL	National Electricity Law
NEM	national electricity market
NEO	national electricity objective
NER	national electricity rules
Opex	operating expenditure
PTRM	post-tax revenue model
RAB	regulatory asset base
RIT–T	regulatory investment test for transmission
TNSP	transmission network service provider
WACC	weighted average cost of capital

Executive Summary

TransGrid and AEMO are progressing a project to expand the transmission transfer capacity of the Victoria-New South Wales Interconnector (VNI) by 170 MW (known as the VNI minor upgrade project). TransGrid has sought regulatory approval of the incremental revenue required to recover the efficient costs of this project, through a contingent project application (CPA). AEMO is separately progressing the Victorian component of this project through the Victorian planning arrangements and there is no requirement for a contingent project application under these arrangements.

We have determined that TransGrid can recover $6.6 million in additional revenue through transmission charges over the current regulatory period (from 2020-21 to 2022-23). This reflects an estimate of the prudent and efficient capital expenditure for delivering the project of $45 million ($2017-18). The actual project costs will then be added to TransGrid's regulatory asset base (RAB) at the end of the current regulatory control period. The overall outcome of this determination is to increase annual transmission charges by $1 for an average residential electricity bill in NSW.

Our determination will allow TransGrid to expand the transmission capacity between Victoria and NSW to meet demand following Liddell Power Station's forecast retirement over 2022 and 2023, while also ensuring the costs incurred are prudent and efficient, and consumers do not pay more than necessary. This investment will benefit consumers and producers of electricity by deferring the need to build new generation and storage capacity in New South Wales, as well as allowing for more efficient sharing of generation across the NEM, and supporting the ongoing energy market transition.

This determination is the final step in the regulatory approval process for the VNI minor upgrade project.

VNI minor upgrade contingent project application

The VNI minor upgrade project was identified in both the 2018 and 2020 Integrated System Plans (ISP) as a priority or actionable project. TransGrid lodged their application, consistent with the new ISP provisions introduced in the National Electricity Rules (NER), to turn the ISP into 'action'.

This is the first actionable project to be submitted to us under the new ISP decision rules in the NER, and AEMO has provided confirmation that the project and proposed costs are consistent with the ISP. TransGrid lodged the VNI minor CPA on 26 November 2020. We received three submissions after consulting on the CPA for two weeks in December 2020. TransGrid's application sought a $6.6 million increase in their revenue allowance over the remainder of the 2018-23 regulatory control period to deliver the VNI minor upgrade project.

Our assessment

TransGrid's application proposed $45 million ($2017-18) in capex to undertake the project and $2 million in incremental opex.

TransGrid has elected to apply the new ISP triggers in putting forward this CPA, instead of the contingent project triggers in their 2018-23 revenue determination. As such, our role is limited to an assessment of the efficiency of the proposed capital and operating expenditure.

Our assessment identified another project between Upper Tumut to Yass that was included in TransGrid's Network Capability Incentive Performance Action Plan (NCIPAP) that overlaps with $1.6 million of CPA costs, to install 'SmartWires' units at Yass substation. However, the costs allocated in the CPA and NCIPAP are difficult to completely separate. Hence, the current CPA determination is acknowledging that a substantial part of the VNI minor upgrades is being delivered through the NCIPAP project.

We are satisfied that the proposed forecast capex is expenditure that would be incurred by an efficient and prudent operator to deliver this project on the basis that:

- around 36 per cent of the capital cost estimates for the VNI project were based on contracted prices derived from competitive market tendering. We consider that TransGrid have run an efficient tendering process that is consistent with good industry practice.
- the proposed scope of works generally reflects the necessary works that we would anticipate as being required to deliver and install the equipment (i.e. the SmartWires modular power flow controller solution). However, we would expect that similar future project proposals should provide more clarity on the scope of civil works needed to facilitate the installation of the SmartWires technology, and what efficiencies have been identified through the early contractor involvement process.
- TransGrid's proposed overheads amount to 16 per cent of capex, which is substantially higher than the 9 per cent that the AER approved in the QNI minor project decision.[1] However, given the smaller size of this project, it is expected that the overhead costs will be significantly higher as a proportion of total project costs than the QNI, and as such we are satisfied that they are prudent and efficient.

TransGrid's proposed incremental opex is predominately related to maintenance costs by the SmartWires proponent. We have accepted the proposed incremental opex on the basis that TransGrid does not have the expertise to maintain these assets, that it must use the SmartWires to maintain these assets.

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[1] AER, Final Decision TransGrid Contingent Project QNI Minor Upgrade, April 2020, p 21.

1 Introduction

Contingent projects are significant network projects that may arise during the regulatory control period but the need and or timing is uncertain.

While the expenditures for such projects do not form part of our assessment of the total forecast capex that we approve in a revenue determination, the cost of the projects may ultimately be recovered from customers in the future. The cost of contingent projects may be recovered from customers under the new Integrated System Plan triggers framework if:

- they are defined as actionable in AEMO's Integrated System Plan (ISP);
- a Regulatory Investment Test for Transmission is completed;
- AEMO provides written confirmation that the project has passed the 'feedback loop' assessment process[2]; and
- the forecast capital expenditure (capex) and operating expenditure (opex) is demonstrated to be reasonably likely to reflect prudent and efficient costs. If we are not satisfied that this is the case, the AER is required to determine a substitute forecast.

In both AEMO's July 2018 Integrated System Plan (ISP) and the 2020 ISP an upgrade of the Victoria to New South Wales interconnector was identified as a priority or actionable project.

AEMO (as the Victorian transmission network planner) and TransGrid jointly undertook a RIT-T between 2018 and 2020. The identified need for investment is to realise net market benefits by increasing the power transfer capability from Victoria to New South Wales. The project reduces market costs by more efficiently sharing generation resources between states, and by providing greater access to diverse sources of generation between regions.

1.1 Our role in the process

The AER is the economic regulator for electricity transmission and distribution services in the National Electricity Market.[3] Our electricity-related powers and functions are set out in the National Electricity Law (NEL) and NER.

In accordance with the NER, when we receive a contingent project application (CPA), we publish the application and seek comment from interested stakeholders. In considering a CPA, we undertake the following steps:

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2 NER, clause 5.16A.5.

3 In addition to regulating NEM transmission and distribution, we also monitor the wholesale electricity and gas markets to ensure suppliers comply with the legislation and rules, taking enforcement action where necessary, and regulated retail energy markets in Queensland, NSW, the ACT, SA and Tasmania (electricity only) under the National Energy Retail Law.

- assess the application to determine whether it contains the information required by the NER;[4]
- examine evidence provided to determine if the mandatory ISP trigger event/s has/have occurred;
- analyse the application to determine if the costs proposed represent a reasonable forecast of the capex and incremental opex required to undertake the contingent project, both overall and in each year remaining in the regulatory control period. If we are not satisfied that this is the case, we must determine a substitute forecast; and
- where we have departed from the network business' application, we apply our adjustments to the post-tax revenue model (PTRM) to calculate the revenue the network business may charge customers for the remainder of the regulatory control period.

1.2 TransGrid's contingent project application

TransGrid is responsible for providing electricity transmission services in New South Wales. We regulate the revenues that TransGrid and other TNSPs can recover from their customers through determinations that cover the span of a regulatory control period. TransGrid's current revenue determination is for the 2018–23 regulatory control period. The expenditure proposed in this CPA was not included in TransGrid's revenue allowance for the 2018-23 regulatory control period.

TransGrid's CPA includes a PTRM[5] containing amended revenue amounts calculated under our current regulatory approach.[6] This would add $6.6 million in incremental revenues over the remaining two years of the 2018-23 regulatory control period.[7]

Table 1 shows TransGrid's proposed annual incremental revenues.

Table 1 Proposed incremental revenue requirement ($ million, nominal)[8]

	2020-21	2022-23	Total
Project revenue requirement	3.2	3.4	6.6

4 NER cl. 6A.8.2(b).

5 TransGrid, *VNI Contingent Project – Post-tax Revenue Model – Base Model*, November 2020.

6 Our current regulatory framework indexes the RAB for CPI and depreciates capex under an 'as-commissioned' approach. The 'as-commissioned' approach means the recognition of capex occurs when the asset related to the expenditure has been commissioned.

7 TransGrid, VNI Minor Upgrade: Contingent Project Application, 27 November 2020, p.14. This amount is the incremental revenue calculated under the AER's current regulatory framework.

8 AER analysis, TransGrid, *VNI Contingent Project – Post-tax Revenue Model – Base Model*, November 2020.

TransGrid's application proposed forecast capex for the project of $45 million ($2017–18).[9] This is comprised of the following separate project elements:

- procurement of equipment (e.g. modular power flow controllers),
- construction and installation of lines, substation and secondary systems equipment to the existing transmission network; and
- project overheads.[10]

These proposed costs are broadly consistent with the cost estimates assumed in the RIT-T for this project.[11] The forecast incremental opex for the project is $2 million.[12] This primarily relates to maintenance and insurance costs once the assets have been installed and commissioned.

1.2.1 Financeability rule change

Since submitting their contingent project application, TransGrid sought changes to the NER to support the financeability of large transmission projects. The impact of the proposed rule changes is to bring forward the timing of revenues in the current regulatory period to support the businesses in obtaining financing for the project, and other major ISP projects, on satisfactory terms.

TransGrid's CPA submitted a second PTRM[13] which shows the impact of its proposed rule change on the incremental revenues for its component of the VNI minor upgrade in the 2018-23 regulatory control period.[14] However, this determination sets incremental revenues based on the current rules as the AEMC has said in its final determination that it will not be supporting the rule change proposal.[15]

1.2.2 Our assessment approach

To assess TransGrid's application for a contingent project, we followed the process set out in NER clauses 6A.8.2. After verifying that the project trigger events occurred (see Section 2.1), we:

- verified that the amount sought exceeded the threshold for a contingent project as set out in clause 6A.8.1(b)(2)(iii); and
- assessed the application and submissions received.

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9 TransGrid, VNI Minor Upgrade: Contingent Project Application, 27 November 2020, p.16.

10 TransGrid, VNI Minor Upgrade: Contingent Project Application, 27 November 2020, p.1.

11 Costs forecast in this CPA are ~11 per cent higher than in the Project Assessment Conclusions Report undertaken by AEMO for the VNI Minor Upgrade.

12 TransGrid, VNI Minor Upgrade: Contingent Project Application, 27 November 2020, p.18.

13 TransGrid, *VNI Contingent Project – Post-tax Revenue Model – Financeability Rule Change*, November 2020.

14 This approach does not index the RAB for CPI and depreciates capex on an 'as-incurred' basis. 'As-incurred' means the recognition of capex in any one year is based on the expenditure in that particular year.

15 AEMC, Participant derogation – financeability of ISP projects (TransGrid), 8 April 2021.

Our review focused on whether the proposed project scope and forecast costs reasonably reflected the capex and opex criteria under the NER.[16] Where we were not satisfied by the information presented in TransGrid's application, we sought further information from TransGrid, including on the following matters:

- whether there is some duplication of proposed capex which is being recovered elsewhere in TransGrid's revenue determination;
- the reasonableness of the proposed project capex, given the project scope and technical specifications, having regard to the outcomes of TransGrid's procurement and contracting processes; and
- the reasonableness of the proposed incremental opex, given the discrepancy between the forecast we approved for a SmartWires NCIPAP as part of TransGrid's 2018-23 Revenue Determination.

[16] NER cl. 6A.6.7(c)(1)–(3) and NER cl. 6A.6.6(c)(1)–(3) set out the capex and opex criteria, respectively.

2 Our determination

In accordance with clause 6A.8.2 of the NER, our determination is that TransGrid's revenue allowance for the 2018-23 regulatory control period be amended to allow it to recover the efficient costs of the VNI minor upgrade project.

First, we are satisfied that:

- the trigger event in cl. 5.16A.5 for this project has occurred (see section 2.1); and
- the capital expenditure amount sought exceeds the applicable expenditure threshold specified in the NER (see section 2.2).

Second, in accordance with clause 6A.8.2(e) of the NER, we have determined:

- the amount of capex and incremental opex for each remaining year of the regulatory control period that we consider is reasonably required for the purpose of undertaking the contingent project (see sections 2.3 and 2.4);
- the total capex we consider is reasonably required to undertake the contingent project (see section 2.3); and
- the incremental revenue which is likely to be required by TransGrid for each remaining regulatory year as a result of the contingent project (see section 3).

2.1 Trigger events

To be eligible, for our approval of the contingent project, TransGrid is required to demonstrate that a specified trigger event has occurred.

Consistent with the new ISP provisions in the NER, TransGrid lodged its application in accordance with clause 5.16A.5 of the NER rather than the project trigger events in our 2018-23 Revenue Determination.

The trigger events under NER clause 5.16A.5 are:

(a) the RIT-T proponent must issue a Project Assessment Conclusions Report (PACR) that meets the requirements of clause 5.16A.4 and which identifies a project as the preferred option (which may be a stage of an actionable ISP project if the actionable ISP project is a staged project);

(b) The RIT-T proponent must obtain written confirmation from AEMO that:

  i. the preferred option addresses the relevant identified need specified in the most recent ISP and aligns with the optimal development path referred to in the most recent ISP: and

  ii. the cost of the preferred option does not change the status of the actionable ISP project as part of the optimal development path as updated in accordance with clause 5.22.15 where applicable;

(c) No dispute notice has been given to the AER under rule 5.16B(c) or, if a dispute notice has been given, the in accordance with rule 5.16B(d), the

dispute has been rejected or the PACR has been amended and identifies that project as the preferred option; and

(d) the cost of the preferred option set out in the contingent project application must be no greater than the cost considered in AEMO's assessment in subparagraph (b).

We are satisfied that cl. 5.16A.5 has been met and that TransGrid's application is compliant. This is because:

- on 14 February 2020, AEMO and TransGrid jointly released the PACR for the VNI Minor RIT-T which identified the preferred option and no disputes were raised.
- on 26 November 2020, AEMO provided written confirmation to TransGrid that the remaining aspects of the trigger event was satisfied.[17]
- the cost of the preferred option provided in TransGrid's contingent project application is the same as that provided to AEMO in its consideration of whether the preferred option meets the trigger event.

2.2 Expenditure threshold

The NER currently stipulates the capex threshold for a contingent project — namely, that the proposed capex exceeds either $30 million or 5 per cent of the value of the maximum allowed revenue (MAR) for the relevant TNSP for the first year of the relevant regulatory control period, whichever is the larger amount.[18]

The maximum allowed revenue in the first year of TransGrid's 2018-23 regulatory control period is $716.7 million ($2017-18). Five per cent of this value is $36 million ($2017-18). This is higher than $30 million and is the relevant expenditure threshold. TransGrid's forecast capex for the contingent project is $45 million ($2017-18). This exceeds (and therefore meets) the expenditure threshold of $36 million.

2.3 Proposed Capital expenditure (capex)

This section sets out our assessment of the efficiency of the proposed capex that is required to deliver the VNI minor upgrade project.

TransGrid's proposed capex forecast of $45 million ($2017–18) is comprised of the procurement of equipment (e.g. SmartWires), construction and installation (e.g. substation and secondary systems works) and project overheads.[19] This is shown in Table 2.

[17] AEMO, Letter to TransGrid RE: Feedback loop confirmation: VNI Minor Upgrade, 26 November 2020.

[18] NER cl. 6A.8.1(b)(2)(iii).

[19] TransGrid, VNI Minor Upgrade: Contingent Project Application, 27 November 2020, p.15-17.

Table 2 TransGrid's proposed capex forecast ($ million 2017-18)[20]

Cost component	Total
SmartWires	21.3
Substations (incl. SmartWires installation costs)	13.2
Transmission lines	0.4
Secondary systems	2.6
Direct labour	3.6
Network and corporate overheads (including indirect labour)	3.6
Real input costs	0.2
Total capex	45.0

Note: Totals may not add up due to rounding.

TransGrid's CPA also provided supporting reports provided by technical consultants. These included an independent verification and engineering assessment of the proposal (GHD) and an assessment of the consistency of its proposed capex with the NER requirements (HoustonKemp).[21]

The key changes to the forecast capex from the PACR was attributable to the availability of information on the prudent and efficient market-based costs of delivering substation upgrades. These costs increased by $4.2 million (Real 2017-18) from the PACR forecast of $9.0 million.[22] The updated forecast from the PACR in the proposal reflects the outcomes of further negotiations and refinement with SmartWires for the Modular Power Flow Controller (MPFC) and competitive procurement processes with multiple bidders for the sub-station, transmission line and secondary system works.[23]

2.3.1 Capex assessment

2.3.1.1 Modular Power Flow Controller (MPFC) or 'SmartWires' procurement

The SmartWires component of the CPA cost, amounting to $21.3 million (or 47 per cent of total proposed capex), is for a proprietary solution subject to intellectual property protection. Consequently, the MPFC technology that the VNI minor project

[20] TransGrid, VNI Minor Upgrade: Contingent Project Application, 27 November 2020, p.16-17.

[21] GHD, VNI - Independent Verification and Assessment - TransGrid, 27 October 2020; HoustonKemp, Consistency of TransGrid's proposed capital expenditure for the VNI upgrade with the NER requirements, 28 October 2020.

[22] TransGrid, Capex Forecasting Methodology for VNI Minor Upgrade Project, November 2020, p. 6.

[23] TransGrid, Capex Forecasting Methodology for VNI Minor Upgrade Project, November 2020, p. 6.

relies on is only available from SmartWires. TransGrid, consistent with the PACR, included proposed costs in its CPA for the procurement and installation of SmartWires on the Upper Tumut and Canberra and Upper Tumut to Yass. The proposed costs represent a decrease of $0.1 million from the PACR forecast of $21.4 million, and is based on the final executed contract cost with SmartWires.[24]

As SmartWires is a proprietary technology, GHD undertook a top-down cost verification assessment to assess whether the costs quoted for the devices are reasonable. SmartWires devices fall within a category of static power electronics tools, known as Flexible AC Transmission Systems (FACTS), that enhance how well power system operators can control power flows across different circuits within a network and in doing so increase the overall power capacity of that network. GHD stated that in comparison with the installed costs of other modular FACTS devices, the SmartWires MPFC solution seems to offer costs that are in the efficient range for comparatively similar technologies.[25]

TransGrid also advised us that the RIT-T underpinning this CPA assumed that the SmartWires project on the Upper Tumut - Yass NCIPAP was already committed and built in the RIT-T modelling. TransGrid also advised that the NCIPAP would be needed to improve transfer capacity from the Tumut to the Yass/Canberra substations by between 170 and 220 MW under the preferred option.[26] We also note that if the cost of the NCIPAP project were included in the cost of the preferred option, it is unlikely that this would affect the PACR outcomes given the estimated costs of alternative options.

As this technology has been assessed to deliver higher net market benefits than the nearest comparable option that meets the identified project need, we are satisfied that the proposed costs of this technology solution is prudent and efficient.

Overlap with Upper Tumut-Yass SmartWires NCIPAP scheme project

As part of our contingent project cost assessment we identified another SmartWires project between Upper Tumut to Yass that has been included in the AER's NCIPAP scheme. The NCIPAP is a component of the electricity transmission Service Target Performance Incentive Scheme (STPIS) and seeks to incentivise network capability improvements that are likely to reduce generation dispatch constraints and thereby reduce wholesale prices, especially at times of peak demand.

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[24] TransGrid, Capex Forecasting Methodology for VNI Minor Upgrade Project, November 2020, p. 6.

[25] GHD, VNI - Independent Verification and Assessment, 27 October 2020, p. 32.

[26] TransGrid's response to the AER's Request for Information, 19 March 2021, p. 1.

Table 3 TransGrid's proposed capex forecast ($ million 2017-18)

Cost component ($m)	Total
Yass NCIPAP SmartWires (Not part of this project)[27]	5.6
Yass VNI Minor SmartWires[28]	1.6
Stockdill VNI Minor SmartWires[29]	19.7

The NCIPAP project and the VNI SmartWires projects are provided in Table 3. We sought further information from TransGrid to verify that the Upper Tumut - Yass SmartWires NCIPAP project was not duplicating the same SmartWires project in the CPA. TransGrid advised that the Upper Tumut - Yass SmartWires NCIPAP project was separate from this CPA but the NCIPAP project was required to allow the full transfer capacity of 170 MW assumed in the VNI minor RIT-T.[30] This was also supported by further information provided by TransGrid.[31]

Based on the information provided by TransGrid we are satisfied that the NCIPAP SmartWires project does not duplicate the Yass SmartWires project's network cost.

TransGrid's proposed network and SmartWires installation costs comprise:

- major substation works at Stockdill to facilitate[32] the installation of the SmartWires modular power flow controllers and civil works for access road construction,[33]
- minor substation works at Yass, including the installation of six additional SmartValves unit and other works; and
- secondary system construction works, including protection replacement works, subsequent testing and commissioning support.[34]

TransGrid submitted that it undertook a competitive early contract involvement process to procure the major substation works at the Stockdill substation and minor substation works at Yass using their existing Construction Services Panel.[35]

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27 AER, Final Decision TransGrid Transmission Determination 2018 to 2023, Table 1.6, p. 14.

28 TransGrid, A6 - Capex forecasts for VNI, SmartWires D5.

29 TransGrid, A6 - Capex forecasts for VNI, SmartWires, D6.

30 TransGrid's response to the AER's Request for Information, 19 March 2021, p. 1.

31 TransGrid response to the AER's Request for Information, 19 March 2021.

32 TransGrid response to the AER's Request for Information, 19 March 2021.

33 TransGrid. VNI Contingent Project - Capex forecasting Methodology. November 2020 p. 14.

34 TransGrid, Capex Forecasting Methodology for VNI Minor Upgrade Project, November 2020, p. 1.

35 TransGrid used a competitive early contract involvement (ECI) tender process to procure major substation works at the Stockdill substation and minor substation works at Yass using their existing Construction Services Panel. TransGrid periodically release competitive tenders for a panel of providers who then respond to specific requests during the period that the panel is operational.

We consider TransGrid's proposed capex estimate is reasonable on the basis that a competitive tendering process identified the lowest cost bidder who was also assessed to have the higher score for technical and commercial outcomes.[36]

We undertook a technical review and concluded that TransGrid has followed good industry practice through its competitive tendering process. This was evident in their early involvement of the two contractors who submitted detailed tender documentation to their scope of works, and the supporting information also demonstrated that both are capable of delivering the required scope.

We identified two potential areas where the ECI process may have delivered greater efficiency being:

- the extent of civil works that were considered necessary at Stockdill (the civil works at Yass are minor); and
- the number of proposed protection relays underpinning the proposed secondary system costs.

Civil works

The civil works for Stockdill and Yass are included in the external contract, and while the cost of the civil works was subject to competitive tender, TransGrid set the scope of these works.

While we accept that some of the proposed access roadworks at Stockdill are likely required to facilitate the extension works, we would have expected that early contractor involvement should have facilitated the identification of any options that may have been available to reduce the extent of these roadworks. Nonetheless, based on our review of the site layout details any cost saving from alternative access road arrangements at Stockdill are not material in the context of the project's overall costs. We have concluded, therefore, that the Stockdill site layout and roadworks costs are reasonable and we have accepted the proposed costs. Our expectation is that future assessments of civil works that incorporate ECI will need to specify the efficiencies that these competitive processes are likely to deliver across all cost elements, including the design of civil works. Specifying these matters in the CPA will help establish transparency on the extent to which project scope, and costs are optimised through the tendering process.

Distance protection systems

The proposal includes replacement of the existing distance protection systems that have a total expected cost of $3.1 million.[37] This includes changing 26 fault detection devices (i.e. protection relays) across eight sites.[38]

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[36] HoustonKemp Economists Consistency of TransGrid's proposed capital expenditure for the VNI upgrade with the NER requirements. 28 October 2020 p. 17.

[37] TransGrid, A.3, 'Outputs!K10', November 2020.

[38] TransGrid-OER 1713 SNY_NSW constraint Reactance on TL 2 NCIPAP-0117-PUBLIC," Figure 1, p. 2.

Our analysis suggests there is some uncertainty about whether the proposed number of protection relays is appropriate. Based on the information provided, it is difficult to establish whether the number of proposed relays are necessary to reflect a broader impact of the SmartWires installation across the entire 330 kV Murray, Yass, Canberra network.[39] However, our Technical Advisory Group has advised that most or all of these devices are be necessary to successfully test and commission the SmartWires technology.[40]

2.3.1.2 Indirect labour capex

TransGrid's forecast capex includes $7.2 million ($2017-18) for indirect labour capex (or 16 per cent of total proposed capex).[41] Table 4 details TransGrid's proposed indirect labour capex for the VNI minor upgrade project between 2018-19 and 2022-23.

Table 4 TransGrid's proposed capex overheads ($ million 2017-18)[42]

	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Total indirect labour capex	0.26	1.71	3.37	1.90	-	7.25
Total project capex	0.3	3.5	13.7	27.5	-	45.0

Note: Numbers may not add up due to rounding.

TransGrid's forecast indirect labour capex in this contingent project application is based on a bottom-up estimate of additional staff and individual wage rates, including overtime for the project.[43]

A large portion of the project costs are sole sourced where the majority of construction works are contracted to a single supplier, and a majority of works will be on two existing sites. These factors suggest that:

- most of the delivery risk is borne by the prime contractor and the equipment deliverer;
- there is limited or no landholder or public interaction; and
- there are limited environmental and/or geotechnical issues.

For these reasons, we would expect overheads as a proportion of total project costs to be a relatively small component of project costs. Based on GHD's advice we consider in house project costs to be in the order of 15% of the project which is

39 TransGrid-OER 1713 SNY_NSW constraint Reactance on TL 2 NCIPAP-0117-PUBLIC, Figure 1, p. 2.
40 GHD. VNI - Independent verification and assessment. TransGrid 27 October 2020, p. 52.
41 TransGrid, Labour and indirect capex forecast methodology, p. 8.
42 TransGrid, Labour cost methodology, p.8 and TransGrid, Contingent Project Application p. 16.
43 TransGrid, Capex forecasting methodology VNI Minor CPA, November 2020, pp. 26-7.

some $0.5 and $1 million lower than proposed. As this is amounts to 1 to 2 per cent of capex,[44] the difference is not material and accordingly we have accepted the proposed capex.

2.3.1.3 Real Input costs

TransGrid accounted for input price growth by multiplying the labour cost components of the tendered expenditure, property costs, and indirect expenditure by our labour price growth forecasts in TransGrid's 2018-23 revenue determination. We are satisfied that the proposed $0.2 million reasonably reflects prudent and efficient costs.[45]

2.4 Operating expenditure

Table 5 summarises TransGrid's proposed incremental opex requirements. TransGrid applied a bottom-up build approach to forecast incremental opex for the VNI minor upgrade project for the 2018-23 regulatory control period. This includes inflation and real cost escalation assumptions.[46] The incremental opex includes:

- [redacted] of operating and maintenance costs for major works – assuming routine inspection maintenance regimes for power flow converters, switchbay, and transmission lines;[47]
- [redacted] in insurance expenses – that covers the expected insurance premiums for the period following the commissioning of VNI;[48] and
- $0.03 million in debt raising costs.

Table 5 Proposed incremental opex forecast ($ million, 2017-18)[49]

	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Total opex	0.0	0.0	0.0	1.8	0.2	2.0

[44] GHD's assessment (undertaken for TransGrid) found that efficient overheads for a project of this size is ~15.2 per cent of capex.

[45] TransGrid, Capex Forecasting Methodology for VNI Minor Upgrade Project, November 2020, p. 28.

[46] TransGrid, VNI Minor Upgrade: Contingent Project Application, 27 November 2020, p.19.

[47] TransGrid, Opex forecasting methodology - VNI Upgrade Project, 27 Nov 2020, p.4.

[48] TransGrid, Opex forecasting methodology - VNI Upgrade Project, 27 Nov 2020, p.3.

[49] TransGrid, VNI Minor Upgrade: Contingent Project Application, 27 November 2020, p.18.

2.4.1 **Opex assessment**

SmartWires maintenance

Over the 2018-23 regulatory period, opex on the SmartWires devices is about 4 per cent of the proposed capex.[50] Aspects of the SmartWires opex contract relies on proprietary software, inspection technology (e.g. thermal vision), and other third party inspection services.

In assessing these proposed costs, we compared the opex capex ratios of the VNI SmartWires projects with the NCIPAP SmartWires project. Our assessment found that the opex proposed for this CPA is substantially higher than that proposed for the Yass SmartWires NCIPAP project approved in TransGrid's 2018-23 revenue determination. However, TransGrid advised that SmartWires was not consulted in developing the opex estimates for the NCIPAP project and as such they are not representative of the actual maintenance costs.[51]

TransGrid does not have the expertise to maintain these assets and must use the SmartWires proponent for these specialist services to maintain these assets. We have accepted the proposed opex on the basis that TransGrid tendered out the services. However, we would expect future proposals that utilise SmartWires technology to identify the specific maintenance activities that need to be undertaken on the SmartWires units.

Insurance costs

TransGrid has not tested the market in seeking premium estimates for managing the risks associated with damage to these assets. However, we accept that the insurance for this project is appropriate in managing the risk of operating these assets and, we are satisfied that these costs are likely to reflect prudent and efficient costs.

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[50] This opex amount is exclusive of any incremental debt raising costs as a result of the additional expenditure for VNI minor. The PTRM determines an additional $0.03 million ($2017–18) in debt raising costs for the VNI minor contingent project.

[51] TransGrid response, VNI - Smartwires Commercial schedule Confidential, 26 March 2021.

3 Calculation of the incremental requirement

In accordance with clause 6A.8.2(h), we have amended TransGrid's 2018–23 revenue determination with the incremental capex and opex determined in sections 2.3 and 2.4. The following discussion sets out the revised annual building block revenue requirement we approve for TransGrid based on our determination on the forecast capex and opex for the VNI minor project.

Table 6 shows the incremental annual revenue amount for VNI minor.[52] We determined the incremental contingent project revenue amount to be $6.6 million ($ nominal, smoothed). This is the additional amount that TransGrid will recover from customers in the final year of the regulatory control period beginning 1 July 2022. This is equal to the amount proposed by TransGrid.

Table 6 Incremental revenue calculation ($ million, nominal)

	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Return on capital	0.0	0.0	0.3	1.1	3.0	4.4
Return of capital (regulatory depreciation)	0.0	–0.0	–0.1	–0.5	0.2	–0.4
Operating expenditure	0.0	0.0	0.0	2.0	0.2	2.2
Revenue adjustments	0.0	0.0	0.0	0.0	0.0	0.0
Net tax allowance	0.0	0.0	0.0	0.0	0.1	0.1
Incremental annual revenue requirement (unsmoothed)	0.0	0.0	0.2	2.7	3.5	6.4
Incremental annual expected MAR (smoothed)	0.0	0.0	0.0	0.0	6.6	6.6
Change to annual expected MAR (smoothed) (%)	0.0%	0.0%	0.0%	0.0%	0.8%	0.2%

Source: AER analysis.

Note: Numbers may not add up due to rounding.

The overall outcome of this determination is to increase annual transmission charges by 0.8 per cent for the final year of the 2018–23 regulatory control period. We have estimated that the delivery of the VNI minor project would result in an indicative increase of $1 in 2022–23 for an average residential electricity bill in NSW.

In determining the incremental revenues, we have applied the same WACC as set out in the 2018–23 transmission determination. However, we have updated the WACC inputs to reflect the most recent annual trailing average cost of debt.

[52] The revenue we approve is incremental to the 2021–22 RoD updated PTRM (including QNI contingent project).

TransGrid's application reflects the annual trailing average cost of debt for 2020–21.[53] Our final decision includes the 2021–22 updated annual trailing average cost of debt which became available in late January 2021 after TransGrid submitted its contingent project application.

Finally, Table 7 shows TransGrid's total annual building block revenue requirement (unsmoothed), expected MAR and the X-factor inclusive of the incremental revenue determined for this contingent project for each year in the regulatory control period.

Table 7 Total annual building block revenue requirement, expected MAR and X-factors ($ million, nominal)

	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Annual building block revenue requirement (unsmoothed)	734.3	775.7	785.2	806.7	828.8	3930.7
Expected MAR (smoothed)	734.3	759.5	779.5	809.1	851.9	3934.4
X-factors	–0.51%	–0.97%	–0.17%	–1.32%	–2.77%	n/a

Source: AER analysis.

Note: Numbers may not add up due to rounding.

We note that the inputs to the roll-forward model as determined in the 2018-23 final decision do not need to be amended for the contingent project. This is because the proposed contingent project only affects the forecast opening RAB for 2020–21 to 2022–23, which was calculated in the PTRM and reflects the approved capex for the VNI minor project.

TransGrid updated the standard asset life for the 'Equity raising costs' asset class in its proposed PTRM from 'n/a' to 34.3 years. However, this input is not required as there is no equity raising costs associated with the additional revenue approved for this contingent project. We have therefore removed this input from our final decision PTRM.[54]

[53] TransGrid, *VNI Contingent Project – Post-tax Revenue Model – Base Model,* November 2020.

[54] Similarly, we have removed the proposed standard tax asset life of 5 years from the final decision PTRM.

A Response to submissions

This section discusses our consideration of the written submissions from the following stakeholders:

- ERM Power;
- Major Energy Users (MEU); and
- Public Interest Advocacy Centre (PIAC).

All three submissions received were generally supportive of the proposed VNI Minor project. However, MEU and ERM raised a similar issue with respect to the Victorian elements of the investment that the Victorian elements are not specifically required to improve flows from NSW to Victoria, but to improve flows from Melbourne towards northeast Victoria.

MEU and ERM also said that it was unclear whether the Victorian portion of the upgrade was required in light of new committed generation connecting to the Shepparton and Glenrowan terminal stations and the strong 220kV connections between these terminal stations and the Murray Switchyard.

However, we consider that these issues have been assessed through the RIT-T and AEMO has confirmed through the RIT-T feedback loop assessment process that net market benefits exceed total project costs.

PIAC highlighted that the use of proprietary technology exacerbates the risk of cost escalation and limits the potential for competitive pressure to deliver the most efficient price.