DRAFT DECISION
TransGrid transmission determination
2018 to 2023

Attachment 11 − Service target performance incentive scheme

September 2017

AUSTRALIAN ENERGY REGULATOR

Note

This attachment forms part of the AER's draft decision on TransGrid's transmission determination for 2018–23. 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 – Value of imputation credits

Attachment 5 – Regulatory depreciation

Attachment 6 – Capital expenditure

Attachment 7 – Operating expenditure

Attachment 8 – Corporate income tax

Attachment 9 – Efficiency benefit sharing scheme

Attachment 10 – Capital expenditure sharing scheme

Attachment 11 – Service target performance incentive scheme

Attachment 12 – Pricing methodology

Attachment 13 – Pass through events

Attachment 14 – Negotiated services

Contents

Shortened forms

Shortened form	Extended form
AARR	aggregate annual revenue requirement
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ASRR	annual service revenue requirement
capex	capital expenditure
CCP	Consumer Challenge Panel
CCP9	Consumer Challenge Panel sub-panel 9
CESS	capital expenditure sharing scheme
EBSS	efficiency benefit sharing scheme
MAR	maximum allowed revenue
NEL	national electricity law
NEM	national electricity market
NEO	national electricity objective
NER	national electricity rules
opex	operating expenditure
RIN	regulatory information notice
STPIS	service target performance incentive scheme
TNSP	transmission network service provider

11 Service target performance incentive scheme

The service target performance incentive scheme (STPIS) provides a financial incentive to transmission network services providers (TNSPs) to maintain and improve service performance. The current version of the STPIS, version 5, includes three components: a service component, market impact component and network capability component.[1]

The service component provides a reward/penalty of +/- 1.25 per cent of Maximum Allowable Revenue (MAR) to improve network reliability, by focussing on unplanned outages. The service component is designed to encourage TNSPs to seek to reduce the number of unplanned network outages and to promptly restore the network in the event of unplanned outages that result in supply interruptions. This component is also designed to indicate potential reliability issues.

The market impact component (MIC) provides an incentive to TNSPs to minimise the impact of transmission outages that can affect wholesale market outcomes. The MIC measures performance against the market impact parameter which is the number of dispatch intervals where an outage on the TNSP's network results in a network outage constraint with a marginal value greater than $10/MWh (MIC count).[2]

Each TNSP's annual MIC count is measured against its target, where the target is calculated by averaging the median five of the last seven years' performance.[3] Further, the dollars per dispatch interval ($/DI) associated with the reward/penalty for each count can be directly calculated for the regulatory control period from the MIC target, and the MAR. Both the target and the $/DI are fixed for the regulatory control period.

TNSPs receive a reward or penalty of up to 1 per cent of MAR for the relevant calendar year. Under clause 4.2(a) of the STPIS, a TNSP must submit, in its revenue proposal, data for the preceding seven calendar years to calculate the target as noted above.

The network capability component is designed to encourage TNSPs to develop projects (up to a total of one per cent of the proposed MAR per year) in return for a pro-rata incentive payment of up to 1.5 per cent of MAR depending on the successful completion of proposed projects. This component encourages TNSPs to examine their networks to identify suitable low cost one-off operational and capital expenditure projects that improve the capability of the transmission network at times when it is most needed.

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[1]   AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. 2.2(a)(1–3).

[2]   AER, *Final – Service Target Performance Incentive Scheme,* October 2015, Appendix C.

[3]   The target is to be calculated from the average of the five values remaining from the last seven years of data excluding the largest and smallest annual values. Clause 4.2(f)(1) of the STPIS.

11.1 Draft decision

We will apply all components of version 5 of the STPIS to TransGrid for the 2018/19 – 2022/23 regulatory control period in accordance with our Framework and Approach for TransGrid. The draft decision components are outline in the tables below.

Our draft decision is based on the 2010–2016 audited data. For the final decision, we require TransGrid to submit its 2017 data under version 5 of the STPIS with its revised revenue proposal.

Table 11-1   Draft decision — Service Component Caps, floors and targets for 2018/19 – 2022/23

Parameter	Floor	Target	Cap
Average circuit outage rate			
Lines event rate – fault	19.4%	14.0%	9.3%
Transformer event rate – fault	20.5%	15.6%	10.1%
Reactive plant outage rate - fault	17.9%	12.3%	7.8%
Lines outage rate - forced	27.1%	15.4%	1.4%
Transformer outage rate - forced	40.9%	26.6%	15.4%
Reactive plant outage rate - forced	29.0%	22.7%	15.7%
Loss of supply events			
Number of events > 0.05 system minutes per annum	7	3	1
Number of events > 0.25 system minutes per annum	3	1	0
Average outage duration	299	134	41
Proper operation of equipment			
Failure of protection system	27	20	13
Material failure of supervisory control and data acquisition (SCADA) system	24	8	0
Incorrect operational isolation of primary or secondary equipment	12	7	3

Source: AER analysis

Table 11-2   Draft decision — MIC parameter values for 2018/19 – 2022/23

Calendar year	adjusted performance count
2010	780
2011	872
2012	737
2013	593

Calendar year	adjusted performance count
2014	750
2015	1329
2016	1832
Target (draft decision, place holder)	900
Cap for unplanned outages	153
Dollar per dispatch interval	$7923/DI

Source: AER analysis

Table 11-3   Draft decision — Network capability priority projects for 2018/19 – 2022/23 ($ June 2018)

Priority projects ranking assigned by TransGrid	Project	Description	Improvement target	Capex $	Opex $	Total $
2	North Western Transfer Tripping Scheme	The North Western transfer tripping scheme would open the Narrabri-Moree 132 kV line (96M) in protection clearing time following outage of both Armidale-Tamworth 330 kV lines (85 and 86).	Commissioning of transfer tripping scheme. Moree solar farm allowed to supply during outage of 85 or 86 line.	120,000	2,400	122,400
3	Replace limiting high voltage plant at Wagga 132 kV substation (Line 99X rating augmentation)	Replace wave trap on line 99X at Wagga 132 substation	184 MVA (due to wave trap at Wagga 132 on line 99W)	638,000	-	638,000
9	SMART wires on Upper Tumut-Yass 330 kV line	Installation of SMART wires to reduce reactance of Upper Tumut-Yass 330 kV line.	Increase the Snowy – NSW cut-set capacity by 26 MW to 2735 MW	5,600,000	110,000	5,710,000
10	Dynamic Line Rating Monitoring	Install Dynamic Line Ratings system	4 to 20% increase from normal circuit rating during favourable weather conditions.	5,160,000	100,000	5,260,000

11	Implementation of transfer tripping Scheme at Cooma	Implement a control system to trip Boco Rock windfarm, following a coincident outage both Williamsdale-Cooma 132 kV circuits (978 & 97D).	Boco Rock wind generator allowed to operate at full output following a planned or unplanned outage of 978 or 97D 132 kV circuit.	130,000	-	130,000
13	Implementation of transfer tripping scheme at Gadara, Tumut and Burrinjuck	Implement a control system to trip Gadara-Tumut (99P), Tumut-Burrinjuck (992) and Tumut-Blowering(97B) 132 kV circuits following coincident outage of Yass-Burrinjuck (970) & Wagga-Gadara (993), Burrinjuck-Tumut (992) & 993, 970 & Gadara-Tumut (99P) or 992 & 99P 132 kV circuits.	Installation of tripping scheme would allowing generators at Burrinjuck, Blowering and Gadara to operate at full output following a planned or unplanned outage of a single 132 kV circuit.	360,000	6,800	366,800
15	Queensland-New South Wales (QNI) interconnector	Installation of a 330 kV, 120 MVAr shunt capacitor bank at Armidale substation	Installation of capacitor and update of constrain equations in AEMO's NEMDE	4,690,000	94,000	4,784,000
17	Implement dynamic rating system for Darlington Point 330/220 tie transformers	Develop & implement dynamic rating system for Darlington Point 330/220 kV transformers	202 MVA during favourable conditions	600,000		600,000
18	Replace limiting high voltage plant on Mt Piper-Wallerawang 330 kV lines (TL 70 and 71)	Replace limiting HV plant and upgrade secondary plant limitations on Mt Piper-Wallerawang 330 kV lines at Mt Piper and Wallerawang substations.	1300 MVA	3,330,000	67,000	3,397,000
20	Armidale capacitor transfer tripping scheme	Implementation of transfer tripping scheme for the Armidale 132 kV capacitor bank	Remove market impact to realise a Market benefit = $0.03 million/year (based on the historical binding constraints	200,000	-	200,000

			information).			
21	Increase Ratings of Wagga-Lower Tumut 330 kV line (TL 051)	Replace wave traps at LTSS and increase CT ratio at Wagga SS.	Replaced line wave trap improves the limit to 1371 MVA (2400 amps)	300,000	-	300,000
22	Capacitor bank to improve NSW-VIC transfer limit	Installation of a 330 kV 100 MVAr shunt capacitor bank at Stockdill substation.	Voltage stability limits that cause constraints on NSW export to Victoria. Market impact = $0.79 million /year	5,510,000	110,00	5,620,000
Total				26,638,000	490,200	27,128,200

11.2 TransGrid's proposal

TransGrid's revenue proposal adopted our Framework and Approach paper and proposed to apply version 5 of the STPIS to all components.[4]

11.3 Assessment approach

A revenue determination for a TNSP is to specify, amongst other things, the annual building block revenue requirement for each regulatory year of the regulatory control period.[5] In turn, the annual building block revenue requirement must be determined using a building blocks approach, under which one of the building blocks is the revenue increments or decrements (if any) for that year arising from the application of any STPIS (and other schemes).[6] We have assessed TransGrid's revenue proposal against the requirements of version 5 of the STPIS.

11.3.1 Service component

We assessed whether TransGrid's proposed performance targets, caps and floors comply with the STPIS requirements for:[7]

- average circuit outage rate, with six sub parameters[8]

- loss of supply event frequency, with two loss of supply event sub-parameters[9]

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[4] TransGrid, *Revenue Proposal 2018/19 – 2022/23*, January 2017, pp. 218–222.

[5] NER, cl. 6A.4.2(a)(2).

[6] NER, cll. 6A.5.4(a)(5), 6A.5.4(b)(5) and 6A.7.4.

[7] AER, *Final – Service Target Performance Incentive Scheme,* October 2015*,* clause 3.2.

[8] Six parameters include Line event rate–fault, Reactive plant event rate – fault, Lines event rate – forced, Transformer event rate –forced and Reactive plant event rate – forced.

- average outage duration

- proper operation of equipment, with three sub-parameters.[10]

Under the STIPS, we must accept TransGrid's proposed parameter values if they comply with the requirements of the STPIS. We may reject them if they are inconsistent with the objectives of the STPIS.[11] We measure actual performance for the 'average circuit outage rate' and 'average outage duration' parameters on a two calendar year rolling average in accordance with appendix E of the STPIS.

We assessed TransGrid's service component proposal against the requirements of the STPIS — that is, whether:

- TransGrid's data recording systems and processes produce accurate and reliable data and whether the data is recorded consistently based on the parameter definitions under the STPIS[12]

- the proposed performance targets were equal to the average of the most recent five years of performance data[13]

- any adjustments to the proposed targets are warranted and reasonable[14]

- TransGrid applied a sound methodology, with reference to the performance targets, to calculate the proposed caps and floors[15]

- any adjustment to a performance target was applied to the cap and floor of that parameter.[16]

11.3.2 Market impact component

We assessed TransGrid's market impact component proposal against the requirements of the STPIS — that is, whether:

- data used to calculate the market impact parameter is accurate and reliable, and consistently recorded based on the parameter definition in Appendix C.[17]

- the proposed performance target was calculated in accordance with the requirements of clause 4.2(f) in version 5 of the STPIS.

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9   They are the number of events greater than 0.05 system minutes per annum and the number of events greater than 0.25 system minutes per annum.

10   They are failure of protection system, material failure of SCADA system and incorrect operational isolation of primary or secondary equipment.

11   AER, *Final – Service Target Performance Incentive Scheme, October 2015,* cl. 3.2.

12   AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. 3.2(d).

13   AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. 3.2(g).

14   AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 3.2(j).

15   AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. 3.2(e).

16   AER, *Final – Service Target Performance Incentive Scheme, October 2015,* cl. 3.2(e).

17   AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. 4.2(c).

- the proposed unplanned outage event limit has been calculated in accordance with the requirements of clause 4.2(h) in version 5 of the STPIS.

- the proposed dollar per dispatch interval has been calculated in accordance with clause 4.2(j) in version 5 of the STPIS.

Where TransGrid's proposed values for the market impact parameter does not comply with the requirements of the STPIS or is otherwise inconsistent with the objectives of the scheme[18], we will reject the proposed values and provide substitute values which comply with the STPIS.

11.3.3 Network capability component

We assessed TransGrid's network capability component against the STPIS requirements to take into account:[19]

- the likely effect of the priority project improvement on wholesale market outcomes, including inter-regional outcomes

- the likely effect of the priority project improvement in ensuring that the transmission network can meet demand at an injection point without major network augmentation or replacement

- whether the priority project improvement is appropriate, taking into account the forecast changes in demand at a relevant injection point

- the benefits to consumers resulting from the priority project improvement

- the extent to which a TNSP would be incentivised or required to undertake such a project under the NER or any other applicable regulatory obligations

- the time taken for a project to have a net positive benefit

- any relevant information contained in the TNSP's most recent annual planning report.

11.4 Interrelationships

The STPIS takes into account any other incentives provided for in the NER that TNSPs have to minimise capital or operating expenditure. One of the objectives of the STPIS is to assist in the setting of efficient capital and operating expenditure allowances by balancing the incentive to reduce actual expenditure with the need to maintain and improve reliability for customers and reduce the market impact of transmission congestion.

The STPIS will interact with the Capital Expenditure Sharing Scheme (CESS) and the opex Efficiency Benefit Sharing Scheme (EBSS). The STPIS allows us to adjust the performance targets of the service component for the expected effects on the TNSP's

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18   AER, *Final* – Service Target Performance Incentive Scheme, October 2015, cl 4.2(d).
19   AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cll. 5.2(l) and 5.2(m).

performance from any increases or decreases in the volume of capital works planned during the regulatory control period. In conjunction with CESS and EBSS, the STPIS will ensure that:

- any additional investments to improve service quality are based on prudent economic decisions

- reductions in capex and opex are achieved efficiently, rather than at the expense of service levels to the network users.

11.5 Reasons for draft decision

We will apply version 5 of the STPIS to TransGrid and the reasons for our draft decision are outline below.

Our draft decision is based on the relevant data for the 2010–2016 years. We require TransGrid to submit its 2017 data under version 5 of the STPIS with its revised revenue proposal for the final decision.

11.5.1 Service component

Performance targets must equal the TNSP's average performance history over the past five years unless they are subject to adjustment under clause 3.2(i) or (j) of the STPIS.[20] We generally approve performance targets that are the arithmetic mean of the past five years' performance data.

We accept TransGrid's performance targets for the next regulatory control period as it is consistent with the methodology outlined in version 5 of the STPIS.[21]

Caps and floors

Proposed caps and floors must be calculated with reference to the proposed performance targets using a sound methodology.[22] We have generally accepted approaches that use five years of performance data to determine a statistical distribution that best fits that data—with the caps and floors set at two standard deviations either side of the mean (if using a normal distribution); or at the 5th and 95th percentiles (if using a distribution other than the normal distribution).

With the exception of the lines event rate fault parameter, we accept TransGrid's performance cap and floor values for the next regulatory control period as it is consistent with version 5 of the STPIS.[23] We tested TransGrid's data using our @risk software and all our outputs were consistent with TransGrid's revenue proposal, except for the lines event rate fault parameter.

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[20]   AER, *Final – Service Target Performance Incentive Scheme,* October 2015*,* cl. 3.2.

[21]   TransGrid, *Revenue Proposal 2018/19 – 2022/23*, 31 January 2017, p. 221.

[22]   AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. 3.2(e).

[23]   TransGrid, *Revenue Proposal 2018/19 – 2022/23, Appendix X WSP Parsons Brinckerhoff: STPIS: Fitting probability curves to reliability data*, September 2016, p. 3.

For the lines events rate fault parameter, TransGrid's consultant, Parsons Brinckerhoff (PB), preferred the Anderson-Darling (A-D) fit statistic over the Kolmogorov-Smirnov (K-S) fit. PB's preferences A-D when the data is "distributed across both the middle and tails of the distribution" and prefers K-S when it is distributed only across the middle of the distribution.

Historically, we have applied the K-S distance statistic in our regulatory determinations to calculate the caps and floors. We do not consider the A-D approach to be a sound methodology for calculating caps and floors. We determine that we will apply the Kolmogorov-Smirnov (K-S) fit statistic to the selection of best-fit distribution to calculate TransGrid's Services' caps and floors. This is consistent with our historical approach to calculating the caps and floors. The K-S distance statistic is based on the maximum difference between the sample distribution and the test distribution. As a refinement, the A-D statistic gives more weight to the tails of the distribution than the K-S test does. We consider the K-S fit statistic is to be preferred due to its simplicity, especially when there is no evidence to suggest the A-D fit statistic is more appropriate in this particular case. Further, with only five data points being available, we consider that placing more weight across both the middle and tail end by using the A-D statistical fit is an unsound methodology.[24]

Table 11-4 sets out the caps and floors for TransGrid.

Table 11-4   Draft decision — Caps and floors and targets for 2018/19 – 2022/23

Parameter	Distribution	Floor (5th percentile)	Cap (95th percentile)
Average circuit outage rate			
Lines event rate – fault	Gamma (KS preferred)	19.4%	9.3%
Transformer event rate – fault	Loglogistic (AD preferred)	20.5%	10.1%
Reactive plant outage rate - fault	Weibull	17.9%	7.8%
Lines outage rate - forced	Loglogistic	27.1%	1.4%
Transformer outage rate - forced	Uniform	40.9%	15.4%
Reactive plant outage rate - forced	Loglogistic	29.0%	15.7%
Loss of supply events			
Number of events > 0.05 system minutes per annum	Poisson	7	1
Number of events > 0.25 system minutes per	Geometric	3	0

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[24]   AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 3.2(e).

annum			
Average outage duration	Loglogistic	299	41
Proper operation of equipment			
Failure of protection system	Poisson	27	13
Material failure of supervisory control and data acquisition (SCADA) system	Geometric	24	0
Incorrect operational isolation of primary or secondary equipment	Poisson	12	3

Source: AER analysis

11.5.2 Market impact component

TransGrid's revenue proposal submitted that the performance target to apply for the next regulatory control period will be based on average performance of the median five years from 2010–16.[25] The final performance targets for the next regulatory control period require 2017 data which is currently not available and will be decided in our final decision.

We reviewed the data provided by TransGrid for the calculation of its MIC target, Cap for unplanned outages, and Dollar per Dispatch Interval for the next regulatory control period. We found that the information and calculation methods are consistent with the scheme's requirements.

The placeholder performance targets to apply are at Table 11-2.

Market impact component weighting

TransGrid's revenue proposal submitted that we should defer the introduction of a penalty for the market impact component and allow it to continue using the 0 per cent to 2 per cent weighting under version 4 of the STPIS.[26]

CCP9 considered a symmetrical financial incentive is appropriate and does not support the deferral of this component.[27]

We agree with CCP9 and do not accept TransGrid's proposition because this approach is inconsistent with the scheme design of Version 5 of STPIS, which specifies a symmetrical incentive mechanism.

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[25]   TransGrid, *Revenue Proposal 2018/19 – 2022/23*, January 2917, pp. 221–222.

[26]   TransGrid, *Revenue Proposal 2018/19 – 2022/23*, January 2017, p. 222.

[27]   Consumer Challenge Panel Sub-Panel 9*, Submission to the AER; Response to proposals from TransGrid for a revenue reset for 2018-19 to 2022-23*, 12 May 2017, p. 86.

11.5.3 Network capability component

11.5.3.1 Approved Network capability priority projects

We accept the following projects in TransGrid's Network Capability Incentive Parameter Action Plan (NCIPAP) because they meet the objectives of the STPIS. Table 11-3 above, outlined the values of these projects.

North Western transfer tripping scheme

The transfer tripping scheme is to address a current issue of having to disconnect the Maree solar farm following a 330kV line outage (line 85 or 86). With the transfer tripping scheme, the Maree solar farm can continue to generate after line 85 or 86 outages.[28]

AEMO considered that it would deliver market benefits based on improved access to low cost solar generation after an outage.[29]

We agree with AEMO's assessment and consider this project will meet the STPIS requirement to facilitate improvements in the capability of transmission assets.[30]

Replace limiting high voltage plant at Wagga 132 kV substation

This project involves replacing wave traps on line 99X so that the current line limit can be lifted, resulting in increase of power transfer limits between Wagga330 and Wagga132 substations from 137MVA to 184 MVA.[31]

AEMO considered that it would improve access to the low cost generation near Tumut.[32]

We accept this priority project because it met the STPIS requirement to facilitate improvements in the capability of transmission assets.[33]

SMART wires on Upper Tumut-Yass 330 kV line

This project involves installing a proprietary product from Smart Wires to reduce the impedance of the Upper Tumut–Yass line to increase the capacity of this line.[34]

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[28]   TransGrid, *Revenue Proposal 2018/19 – 2022/23 Appendix Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 6.

[29]   TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 20.

[30]   AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(l).

[31]   TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 7.

[32]   TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 20.

[33]   AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(n).

AEMO considered this an exploratory type project and the real-time operation is yet to be proven in Australia, and has the potential to improve access to low cost generation.[35]

Smart Wires products are designed to regulate power line flows. It increases network transfer capacity and avoids network constraints binding. For example, in transmission networks, there are situations where the load on one power line reaches the operational limit and imposes a power transfer constraint while other lines operating in parallel are underutilised. In these situations, Smart Wire devices maybe used to transfer load from the fully loaded power line to other underutilised lines, avoiding a pending network constraint.

If this trial is successful, it should present a potentially low cost solution for TNSPs to manage network constraints, and avoid or defer major capital expenditure that would otherwise be required to address the constraint. We consider that this trial has a potential to reduce capital expenditure in the long term.

Hence, we accept this priority project because, despite some level of uncertainty that it will meet the STPIS requirement to facilitate improvements in the capability of transmission assets, this project has significant costs saving potential for all users.[36]

Dynamic line rating monitoring

This project involves installing dynamic line rating monitoring systems (DLR) to determine line rating in real-time. The system would increase line thermal capacity by 4 per cent to 20 per cent under favourable weather conditions.[37]

AEMO considers this project will deliver market benefits by improving access to low cost generation.[38]

We accept this priority project because it met the STPIS requirement to facilitate improvements in the capability of transmission assets.[39]

Implementation of transfer tripping scheme at Cooma

This project involves installing a transfer tripping scheme in Cooma substation. The scheme would allow Boco Rock wind farm to operate at full output following an outage of 978 or 97D between Williamsdale and Cooma.[40]

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34   TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 10.

35   TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 22.

36   AER, *Final – Service Target Performance Incentive Scheme, October 2015*, cl. 5.2(l).

37   TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, pp. 10-11.

38   TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 22.

39   AER, *Final – Service Target Performance Incentive Scheme, October 2015*, cl. 5.2(l).

AEMO considered that the project would provide market benefit by improving access to low cost generators.[41]

We accept this priority project because it met the STPIS requirement to facilitate improvements in the capability of transmission assets.[42]

Transfer tripping scheme at Gadara, Tumut and Burrinjuck

This project involves installing a transfer tripping scheme at Burrinjuck, Blowering and Gadara substations. The scheme would allow generators at these locations to operate at full output under a single line outage of line 993, 99P, 992 or 970.[43]

AEMO considered that this would improve access to low cost hydro generation after a single line outage.[44]

We accept this priority project because it met the STPIS requirement to facilitate improvements in the capability of transmission assets.[45]

Capacitor bank to increase NSW-QLD transfer limit

This project involves installing a 120 MVAr shunt capacitor bank at Armidale substation. The capacitor bank would increase voltage stability limits on the Queensland and New South Wales interconnector.[46]

AEMO considered that it would deliver market benefits based on improved access to interstate low cost generation.[47]

We accept this priority project because it met the STPIS requirement to facilitate improvements in the capability of transmission assets.[48]

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[40] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 11.

[41] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 23.

[42] AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(l).

[43] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, pp. 12–13.

[44] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 23.

[45] AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(l).

[46] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 14.

[47] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 24.

[48] AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(l).

Implement dynamic rating system for Darlington Point 330/220 tie transformers

This project involves developing and implementing dynamic rating systems for the Darlington Point 330/220 kV transformers. The system would increase transformer capacity by 1 per cent (2MVA) during favourable conditions.[49]

AEMO considered that it would deliver market benefit based on improved access to low cost generation.[50]

We accept this priority project because it met the STPIS requirement to facilitate improvements in the capability of transmission assets.[51]

Replace limiting high voltage plant on Mt Piper-Wallerawang 330 kV lines

This project involves replacing limiting high voltage plant and upgrade secondary plant on the Mt Piper-Wallerawang line at both ends. This should improve line summer rating by 19 per cent.[52]

AEMO considered that it should deliver market benefit based on improved access to low cost generation.[53]

We accept this priority project because it met the STPIS requirement to facilitate improvements in the capability of transmission assets.[54]

Armidale capacitor transfer tripping scheme

This project involves implementing a transfer tripping scheme for the Armidale 132kV capacitor bank to allow the capacitor bank to remain in service following an outage of a 330/132 kV transformer. TransGrid stated that it should improve the Queensland and New South Wales Interconnector transfer capacity.[55]

AEMO considered that it should deliver market benefit based on improved access to low cost generation.[56]

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[49]   TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 15.

[50]   TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 24.

[51]   AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(l).

[52]   TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 15.

[53]   TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 24.

[54]   AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(l).

[55]   TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 16.

[56]   TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 25.

We accept this priority project because it met the STPIS requirement to facilitate improvements in the capability of transmission assets.[57]

Increase ratings of Wagga-lower Tumut 330 kV line

This project involves replacing wave traps at the Lower Tumut substation and increasing the Current Transformer ratio at Wagga Substation. TransGrid stated that it should increase the Wagga- lower Tumut substation line thermal rating by 20 per cent.

AEMO considered that it should deliver market benefit based on improved access to low cost generation.

We accept this priority project because it met the STPIS requirement to facilitate improvements in the capability of transmission assets.[58]

Capacitor bank to improve NSW-VIC transfer limit

This project involves the installation of a 330 kV 100 MVAr shunt capacitor bank at Stockdill Substation. The capacitor bank would relieve voltage stability limits that cause constraints on NSW export to Victoria and therefore increases the transfer capability of the New South Wales to Victoria interconnector.[59]

AEMO considered this project would improve access to low cost generation.[60]

We accept this priority project because it met the STPIS requirement to facilitate improvements in the capability of transmission assets.[61]

11.5.3.2 Not approved network capability priority projects

We have not approved the following TransGrid network capability priority projects for the next regulatory control period.

Deniliquin full SCADA augmentation

This project involves installing full supervisory control and data acquisition connectivity on the Deniliquin substation. It is aimed at reducing supply restoration times from 3 hours to 0.5 hours.[62]

AEMO considered that the benefit should be reduced unserved energy (USE).[63]

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[57]   AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(l).

[58]   AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(l).

[59]   TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, pp. 17–18.

[60]   TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 24.

[61]   AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(l).

[62]   TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 6.

Since this project mainly improves reliability rather than increasing network capacity, we consider this project has not met the STPIS requirement to facilitate improvements in the capability of transmission assets.

Over voltage control after automatic under-frequency load shedding event

This project involves implementing over-voltage control schemes to reduce the risk of overvoltage after an under-frequency load shedding event.[64]

AEMO considered that this project is in the category of safe operation of assets.[65]

Since this project mainly improves the voltage quality rather than increasing network capacity level, we consider this project has not met the STPIS requirement to facilitate improvements in the capability of transmission assets.

Remote or self-reset of bus protection

This project involves installing closed-circuit television at selected substations to facilitate busbar restoration work.[66]

AEMO estimated that it should halve the restoration time after an outage.[67]

Since this project mainly improves reliability rather than increasing network capacity level, we consider this project has not met the STPIS requirement to facilitate improvements in the capability of transmission assets.

Two way disconnector to replace line tee connection to Morven substation

This project involves installing two-way disconnectors on Wagga-ANM line to the tee connection to Morven. It should reduce restoration from 24 hours to 0.5 hour following a line outage.[68]

AEMO considered this project should reduce restoration time and unserved energy.[69]

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[63] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 20.

[64] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 7.

[65] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 21.

[66] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 8.

[67] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 21.

[68] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, pp. 8–9.

[69] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 21.

Since this project mainly improves reliability rather than increasing network capacity level, we consider this project has not met the STPIS requirement to facilitate improvements in the capability of transmission assets.

Finley full SCADA augmentation

This project involves installing full SCADA connectivity to Finley 66kV substation. It should reduce supply restoration time.[70]

AEMO considered this project should reduce restoration time and unserved energy.[71]

Since this project mainly improves reliability rather than increasing network capacity level, we consider this project has not met the STPIS requirement to facilitate improvements in the capability of transmission assets.

Installation of two ways disconnector to replace line 976 tee connection to Murrumbateman substation

This project involves installing a two way disconnector on line 976 at the tee connection to Murrumbateman substation. It should reduce Murrumbateman substation restoration time from 24 hours to 0.5 hours following an outage of line 976.[72]

AEMO considers that it should reduce restoration time and unserved energy.[73]

Since this project mainly improves reliability rather than increasing network capacity level, we consider this project has not met the STPIS requirement to facilitate improvements in the capability of transmission assets.

Albury area under voltage load shedding scheme

This project involves installing under-voltage load shedding scheme at Albury and ANM substations. The scheme should reduce the amount of load at risk during a single outage of Jendera transformers, line 99B, 99H, 99Z or 996.[74]

AEMO consider it should reduce unserved energy after an outage.[75]

[70] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 9.

[71] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 21.

[72] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, pp. 9–10.

[73] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 22.

[74] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 12.

[75] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 23.

Since this project mainly improves reliability rather than increasing network capacity level, we consider this project has not met the STPIS requirement to facilitate improvements in the capability of transmission assets.

Taree 132kV bus capacity augmentation

This project involves installing a new circuit breakers bay including a set of current transformers to establish two bus bar protection zones. Currently all busbars are in one protection zone, and a trip of any busbar section would result in total supply interruption.[76]

AEMO considered that this should reduce restoration time from 2 hours to zero.[77]

Since this project mainly improves reliability rather than increasing network capacity level, we consider this project has not met the STPIS requirement to facilitate improvements in the capability of transmission assets.

Remote relay interrogation

This project involves installing fault data interrogation system software (FDIS) at 73 TransGrid sites. The FDIS should enable remote access to fault data.[78]

AEMO considered that it should reduce operational cost.[79]

Since this project does not result in an increase in the network capacity level, we consider this project has not met the STPIS requirement to facilitate improvements in the capability of transmission assets.

Construction of Two-way Disconnector On Line 94M for Ilford Tee

This project will allow the installation of a two-way disconnector at line 94M tee connection for $2.8 million capex and $0.6 million opex.

TransGrid submitted that the two-way disconnector should provide operational flexibility in the event of a line fault on either of the connections to Mt Piper 132 or to Beryl, allow supply to be quickly restored to Ilford in the event of a fault on either of the two sections of line. It recommended the work be undertaken to increase reliability of

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[76] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 13.

[77] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 24.

[78] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, pp. 14–15.

[79] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 24.

supply and reduce the cost of unserved energy in the regulatory period 2018–2023.[80] AEMO considered that the benefit should be reduced unserved energy (USE).[81]

Since this project improves reliability rather than increasing network capacity, we consider this project has not met the STPIS requirement to facilitate improvements in the capability of transmission assets.

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[80] TransGrid, *Need/Opportunity Statement (NOS) Operational excellence – Construction of Two-way Disconnector On Line 94M for Ilford Tee NOS- 000000001632 revision 3.0*, p. 3.

[81] TransGrid, *Revenue Proposal 2018/19 – 2022/23, Y Network Capability Incentive Parameter Action Plan*, September 2016, p. 20.