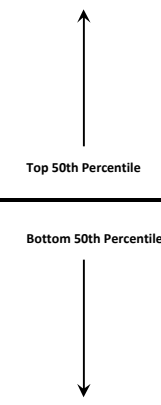


Proposed Priority Projects for NCIPAP (\$'000s, real 2013-14)

Project priority	Project number	Project circuit / Injection point	Project description	2014/15	2015/16	2016/17	2017/18	2018/19	Total cost (\$'000)	Cost type	Comments	Annualised market benefit
1	6	Whole network	Continued operation & maintenance of existing transmission line dynamic rating systems	160	160	160	160	160	800	Opex	Increased power transfer capability.	\$ 15,200,000
2	7	Various circuits and connection sites across the network	Maintenance of prescribed special protection schemes (SPS)	30	30	30	30	30	150	Opex		
3	24	All transmission lines that are currently controlled through AEMO's generation dispatch	Fifteen minute transient ratings for transmission lines	40					40	Capex	Increased power transfer capability.	\$6000 - \$84,000 per line
4	26	Knights Road Substation	Dynamic rating of Knights Road supply transformers	150					150	Capex	Increased power transfer capability.	\$ 456,077
5	18	Boyer Substation	Dynamic rating of Boyer Substation supply transformers	180					180	Capex	Increased power transfer capability.	\$ 507,000
6	12	Farrell-Que-Savage River-Hampshire, Farrell-Rosebery-Queenstown, Norwood-Scottsdale-Derby and Lindisfarne-Sorell-Triabunna 110 kV transmission circuits	Installation of new line fault indicators	30	100	100			230	Capex	Reduced unplanned outage duration.	\$ 588,000
7	14	All transmission circuits whose flow is controlled by AEMO constraint equations	Review and optimisation of Operational Margins for Transend limit equations	35					35	Opex	Increased power transfer capability.	\$79,200 - \$396,000
8	2	Palmerston-Avoca and Knights Road-Huon River-Kermantie 110kV transmission circuits	Line fault indicator (LFI) remote communications	60					60	Capex	Reduced unplanned outage duration.	\$ 88,000
9	31	Basslink Tasmania-Victoria interconnector	George Town automatic voltage control scheme (GTAVCS) 2.0	480					480	Capex	Improved power quality and efficiency gains.	\$ 424,000
10	19	All 220/110kV network transformers	Dynamic rating of all 220/110 kV network transformers		350	350	200		900	Capex	Increased power transfer capability.	\$ 750,000
11	28	Waddamana-Palmerston No 2 110kV transmission circuit	Restricting P1 bay conductor at Palmerston Substation	50					50	Capex	Increased power transfer capability.	\$ 24,986
12	34	Sheffield-George Town 220 kV transmission line	Replace disconnectors, CT and bay conductor to achieve line rating increase and reduce market constraints	350	770				1,120	Capex	Increased power transfer capability.	\$ 493,000
13	32	Weather stations at Creek Road, Chapel Street, Devonport, Trevallyn, Hadspen, Sheffield, and Farrell substations	Weather station telemetry renewal	150	300	150	150	300	1,050	Capex	Increased power transfer capability.	\$ 223,259
14	11	Liapootah-Waddamana-Palmerston No 1, Liapootah-Cluny-Repulse-Chapel Street No 1, Liapootah-Chapel Street No 2 and George Town-Comalco No 4 & 5 220 kV transmission circuits.  Hadspen-Norwood No 1 & 2 110 kV transmission circuits	Upgrade of dead end fittings on selected transmission lines.	200	340	300			840	Capex	Increased power transfer capability.	\$ 175,454
15	16	Farrell Substation	Installation of second 220 kV bus coupler circuit breaker at Farrell Substation	665					665	Capex	Reduced customer impact in the event of a circuit breaker failure.	\$ 94,000
16	1	Castle Forbes Bay Tee Switching Station	Castle Forbes Bay Tee Switching Station disconnector upgrade		30	30	30	30	120	Opex	Reduced planned and unplanned outage duration.	\$ 31,000
17	3	Sheffield-Farrell 1 & 2, Farrell-Reece 1 & 2, Farrell-John Butters 220kV and Farrell-Rosebery-Queenstown 110 kV transmission circuits	Transmission line surge diverter installation and tower footing earthing improvements	150	350	50			550	Capex	Reduced unplanned outage frequency and market constraints in the event of lightning storms.	\$ 68,000
18	33	Multiple	Substandard spans verification and rectification	824	724	724	724	724	3,720	Capex	Maintain compliance and increase line ratings.	\$ 287,000
19	21	Palmerston-Hadspen No 1 & 2, Palmerston-Sheffield and Sheffield-Burnie No 1 220 kV transmission circuits	Installation of modern fault location functionality for more accurate fault location on the identified circuits	60	60				120	Capex	Reduced unplanned outage duration.	\$ 8,500
20	17	Chapel Street Substation	Install a second 110 kV bus coupler dead tank circuit breaker in series with the existing bus coupler circuit breaker					450	450	Capex	Reduced customer impact in the event of a circuit breaker failure.	\$ 25,000
21	9	George Town Substation	George Town Substation replacement of 220 kV disconnectors with remotely operable disconnectors			1,100	2,200		3,300	Capex	Reduced planned and unplanned outage durations.	\$ 80,000
<b>Total Expenditure</b>				<b>3,614</b>	<b>3,226</b>	<b>3,271</b>	<b>3,535</b>	<b>1,741</b>	<b>15,387</b>			
Capex				3,389	2,994	3,024	3,274	1,474	14,155			
Opex				225	232	247	261	267	1,232			



Note: The above total expenditure represents approximately 1.5% of Transends projected MAR

**Weather Station Renewal**

Max demand (MW)	
Load factor	
Outage duration reduction (hr)	
Total MWhr reduction per year	6.02
Value of customer reliability	54,528
Expected unserved energy saving per year (MWh)	\$ 328,259
Total Value of EUSE saved per year	\$ 328,259
Total project cost	\$ 1,050,000
Annualised project cost	\$ 105,000
Net benefit per year	\$ 223,259

Average system load (incl. Basslink) = 1400 MW  
 Dynamic ratings provide an increase in network capability of approximately 20%.

6 sites identified for renewal out of 14 = 43%  
 Assume that if those sites were not renewed, that data quaity would ultimately become unuseable 5% of the time.

