

TD-0003456 - HWPS 220 kV Switchyard Redevelopment, Stage 4 BCR

TD-0003456 HWPS 220 kV Switchyard Redevelopment, Stage 4 Business Case (BC) Revision



Portfolio Business Line:		Work Category:	Work Code / Name:
Transmission		Asset Replacement	2002 TCAPEX Station Rebuilds
Change in Scope: <input checked="" type="checkbox"/>		Change in Time: <input checked="" type="checkbox"/>	Change in Cost: <input checked="" type="checkbox"/>
Key Scope Change:		The project scope has been changed to reflect the future network requirement for this 220 kV switching station following the closure of Hazelwood Power Station. Key changes include removing planned generator switchgear replacements from the scope and making switching changes to minimise further investment whilst avoiding affecting the security of the 220 kV transmission network in the Latrobe Valley.	
Original Commissioning Readiness Date:	New Commissioning Readiness Date:	Original Project Completion Date:	New Project Completion Date:
30/10/18	31/05/22	31/01/19	31/08/22
Original Delivery Budget (\$):		Original Management Reserve (\$):	Original Total Estimated Expenditure (\$):
Capex (\$)	\$23.57 M	\$1.11 M	\$24.68M
New Delivery Budget (\$):		New Management Reserve (\$):	New Total Estimated Expenditure for Approval (\$):
Capex (\$)	\$28.53 M	\$1.31M	\$29.84 M
Change in Ongoing Opex: <input type="checkbox"/>		Negligible	
Change in Benefits: <input type="checkbox"/>		Negligible	
Rationale for Business Case Revision:			
<p>Extra funding of \$3.81M (including CFC's, overheads and management reserve) is sought to complete Stage 4 of the 220kV switchyard redevelopment at Hazelwood Power Station (HWPS). The increase in project cost is partially due to the fact that the project has been on hold since 2017, which has resulted in extra finance charges being incurred and an increase in labour and procurement cost compared with the estimate that was prepared for the business case in 2014.</p> <p>The closure of Hazelwood Power Station in April 2017 triggered a review of the scope of work of the last stage (Stage 4) of the redevelopment of Hazelwood 220 kV switchyard (HWPS) as some of the planned switchgear replacements were no longer needed. Redevelopment Stages 1 to 3 have been completed and whilst most of the procurement of plant for Stage 4 has been completed, some meaningful scope changes were still possible given the new and changed requirement for HWPS. Following a re-tender of the new scope, there have been significant increases in design costs, estimated labour costs and procurement of new materials.</p> <p>Further project delays will result in increased finance charges and will require the installation service contract, which constitutes most of the remaining project cost, to be renegotiated. The project scope has changed to include the following to reflect the new network requirements for HWPS:</p> <ul style="list-style-type: none"> • Retirement of all remaining bulk oil circuit breakers • Continuing with the planned circuit breaker replacements for line connections • Installation of connections between Busses 1 and 2, and Busses 1 and 5 <p>HWPS now serves as a 220 kV hub in the Latrobe Valley and forms part of the 500 kV and 220 kV transmission network ties in the Latrobe Valley. HWPS no longer has direct connected generators, but could be used for this purpose if required. HWPS will continue to play a major role in the transmission of electricity generated from the Latrobe Valley to the major load centre in Melbourne in the short to medium term as the power system transitions from power generation dominated by coal fired power stations to increased renewable generation. HWPS may, however, be subjected to future changes as network reconfiguration becomes feasible after further major generation retirements in the Latrobe Valley.</p> <p>A review of the future need for the HWPS 220 kV switchyard confirmed that HWPS is still an important node in the Latrobe Valley and no credible alternative has been identified, which would have avoided the new proposed Stage 4 scope of work. Not completing Stage 4 is not a feasible option given Victoria's reliance on Latrobe Valley power generation. It is also financially beneficial to continue, as all plant has been procured with the only outstanding activity remaining being the installation and commissioning of the plant.</p>			
Project Initiator & Dept.		BC Revision prepared by:	Date BC Revision submitted:
[C-I-C] Transmission Network Development		[C-I-C]	9/12/2019

TD-0003456 - HWPS 220 kV Switchyard Redevelopment, Stage 4 BCR

Business Case Revision e-sign-off

Key Project Details

Project # / Title / Version	XC28 - HWPS 220 kV Switchyard Redevelopment, Stage 4
Revision (Y/N)	Y

Endorsement:			
Name & Title	Signature:	Date:	Comments
[C-I-C] GM Network Engineering		Mar 2, 2020	Supported to ensure the necessary reliability for this important Latrobe Valley switc
[C-I-C] Manager Major Projects Delivery		Mar 3, 2020	
[C-I-C] Head of PM&R (Acting)		Mar 3, 2020	
[C-I-C] GM Finance - RES		Apr 2, 2020	Noting the first table under 4.0 Cost Impact has an error included but all other tables
[C-I-C] Acting GM – Transmission		Apr 4, 2020	
Approvals:			
[C-I-C] Chief Financial Officer		Apr 4, 2020	
[C-I-C] EGM – Regulated Energy Services		Apr 5, 2020	
[C-I-C] Managing Director		May 15, 2020	

TABLE OF CONTENTS

1. RATIONALE FOR BC REVISION	4
2. BC REVISION IMPACT ASSESSMENT	5
3. SCOPE IMPACT	6
4. COST IMPACT	6
5. OPTIONS.....	8
6. SCHEDULE AND DELIVERABLES IMPACT	9
7. BENEFITS IMPACT.....	10
8. RISKS IMPACT	11
9. OTHER IMPACTS.....	11
10. FINANCIAL ASSESSMENT.....	12
APPENDIX A	14

1. RATIONALE FOR BC REVISION

The closure of Hazelwood Power Station in April 2017 triggered a review of the scope of work of the last stage (Stage 4) of the redevelopment of Hazelwood 220 kV switchyard (HWPS) as some of the planned switchgear replacements were no longer needed. Redevelopment Stages 1 to 3 have been completed and whilst most of the procurement for Stage 4 has been completed, some meaningful scope changes were still possible given the new and changed requirement for HWPS.

HWPS now serves as a 220 kV hub in the Latrobe Valley and forms part of the 500 kV and 220 kV transmission network ties in the Latrobe Valley. HWPS no longer has direct connected generators, but could be used for this purpose if required. HWPS will continue to play a major role in the transmission of electricity generated from the Latrobe Valley to the major load centre in Melbourne in the short to medium term as the power system transitions from power generation dominated by coal fired power stations to increased renewable generation. HWPS may, however, be subjected to future changes as network reconfiguration becomes feasible after further major generation retirements in the Latrobe Valley.

A review of the future need for the HWPS 220 kV switchyard confirmed that HWPS is still an important node in the Latrobe Valley and no credible alternative has been identified, which would have avoided the new proposed Stage 4 scope of work. Not continuing with Stage 4 does not present a feasible option given Victoria's reliance on Latrobe Valley power generation. It is also not a good financial option as all plant has been procured and the only outstanding project component is to install and commission the plant so that these assets can be included in our Regulated Asset Base (RAB).

The increase in project cost is due to the fact that the project has been put on hold until 2019 (business case approved in February 2015), which resulted in increased finance charges, labour cost and procurement cost compared with the estimate that has been prepared for the business case in 2014. Further project delays will result in increased finance charges and will require the installation service contract, which constitutes most of the remaining project cost to be renegotiated.

The project scope change includes the following to reflect the new network requirements for HWPS:

- Retirement of all remaining bulk oil circuit breakers
- Continuing with the planned circuit breaker replacements for line connections
- Installation of connections between Busses 1 and 2, and Busses 1 and 5

2. BC REVISION IMPACT ASSESSMENT

Table 2.1: BC Revision Impact Assessment Summary

Impact	Extreme	High	Medium	Low
Scope Impact	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Budget/Cost Impact	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Schedule/ Time Impact	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Deliverable Impact	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Expected Benefits Impact	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Risks	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Regulatory Impact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Safety Impact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Customer (external) Impact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Resource Impact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Commercial Impact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Business Impact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Scope Impact	Budget/Cost Impact	Schedule/ Time Impact	Deliverable Impact	Expected Benefits Impact	Risks
Extreme	Impacts PORTFOLIO and MORE than TWO other projects Scope	Impacts PORTFOLIO funding/Total costs (Approved Budget expenditure incl. Management Reserve)	Impacts schedule and/or Agreed in Service dates by more than THREE MONTHS.	Impacts PROGRAM deliverables AND adds new/delete planned deliverables	Impacts PORTFOLIO benefits	Impacts and increases current PORTFOLIO risk assessment and introduces NEW risks
High	Impacts the Project and another project	Impacts PROJECT Approved funding (Budget incl. Management Reserve)	Impacts PROJECT schedule and Agreed In Service dates by MORE than ONE MONTH but LESS than THREE MONTHS.	Impacts PROJECTS deliverables MAY add or remove planned deliverables.	Impacts ALL PROJECT benefits as outlined in Business Case(s)	Impacts PROJECT and other RELATED PROJECT risk assessments and has NEW risks
Medium	Increases or Decreases Projects Scope.	Impacts PROJECT Approved funding (within Budget excl. Management Reserve)	Impacts PROJECT schedule LESS than ONE month.	Impacts PROJECTs planned deliverables	Impacts ONE or TWO benefits outlined in Business Case	Impacts current PROJECT risk assessment and MAY have new risks
Low	NO Impact to Project Scope	NO change in PROJECT funding required	Impacts PROJECT schedule LESS THAN ONE week.	Impacts SOME deliverables but NO change in no. of planned deliverables	NO Impact to benefits in Business Case	NO impact to current PROJECT risk assessment AND no new risks

	Regulatory Impact	Safety Impact	Customer (external) Impact	Resource Impact	Commercial Impact	Business Impact
Extreme	Impacts regulatory requirements	Impacts Safety and Mission Zero objectives	Impacts ALL customer(s)s	Change of planned resources and will impact RELATED PROJECTS.	Impacts ALL contract/ vendor commercial arrangements	Impacts ALL AusNet Services business areas
High	SOME IMPACT t to regulatory requirements	Impacts to safety requirements	Impacts MOST customer(s)s and REQUIRES MITIGATION	Change in planned PROJECT resources and additional resources required.	Impacts TWO OR MORE contract/vendor commercial arrangements	Impacts MOST AusNet Services business areas
Medium	MAY IMPACT regulatory requirements	Some impact to safety requirements but CAN BE MANAGED	Impacts SOME customer(s)s but CAN BE MANAGED	Some change in PROJECT resources MAY be required	Impacts ONE or TWO contract/vendor commercial arrangements	Impacts TWO AusNet Services business areas
Low	NO IMPACT to regulatory requirements	NO impact to safety requirements	Impacts NO customer(s)s	NO change in PROJECT resources required	NO impact to commercial arrangements	Impacts ONE AusNet Services business area

TD-0003456 - HWPS 220 kV Switchyard Redevelopment, Stage 4 BCR

3. SCOPE IMPACT

The original scope included replacement of the remaining bulk oil 220 kV circuit breakers, and a number of instrument transformers and surge arrestors.

The retirement of Hazelwood Power Station means that the circuit breakers that previously connected the six generators at HWPS are no longer required.

HWPS is still required as a 220 kV node in the Latrobe Valley and the revision in the project scope provides for retirement rather than replacement of the remaining bulk oil circuit breakers and for changes to the bus ties that couple the six bus bars at HWPS¹.

The Primary works for the current scope can be summarised to include:

- Four (4) existing 220 kV CBs are replaced in situ. Two of the four existing 220 kV CBs is to be replaced with existing CBs from other bays. Other two are to be replaced with new CBs.
- Fourteen (14) 220 kV line side DISCONNECTORS are replaced and relocated closer to the line entry where necessary
- Nine (9) 220 kV bus side DISCONNECTORS are replaced and relocated closer to the CB
- Ten (10) new 3-phase sets of 220 kV surge arrestors are installed
- One (1) existing 3-phase set of 220 kV surge arrestors relocated
- Nine (9) 220 kV single phase capacitor voltage transformers (CVTs) are to be replaced and relocated where necessary
- Three (3) existing 220 kV single phase capacitor voltage transformers (CVTs) are to be relocated

The majority of the above installation work is still to be completed except for two circuit breakers that have already been commissioned.

3.1 Changes to standards that were included in the Approved Business Case

None

4. COST IMPACT

Project XC28 (now TD-3456) Business Case was submitted in December 2014 for completion by 31/10/2018 (Roughly 4 years). After this, Engie announced the closure of HWPS. This resulted in all projects associated with HWPS being put on hold while the implications of the closure were assessed.

Following re-design, scoping and tender functions (which are now completed) AusNet Services now has an offer from Zinfra, which we propose to accept. The Zinfra offer is for \$12.8 million, which will require an increase of \$3.57 million to the current budget of \$24.68 million.

	Original	BCR	Variance	%
Design	\$ 1,400	\$ 1,350	-\$ 50	-3.7%
Internal Labour	\$ 1,427	\$ 2,961	\$ 1,534	51.8%
Materials	\$ 7,723	\$ 7,832	\$ 109	1.4%
P&E	\$ 920	\$ 1,279	\$ 359	28.1%
Contracts	\$ 9,048	\$ 10,290	\$ 1,242	12.1%
Other (Risk)	\$ 1,053	\$ 492	-\$ 561	-114.0%
CFC	\$ 493	\$ 640	\$ 147	23.0%
O/h	\$ 1,510	\$ 1,539	\$ 29	1.9%
Total	\$ 23,574	\$ 26,383	\$ 2,809	10.6%

¹ This cost saving has, however been offset by an increase in the finance charges and labour cost.

TD-0003456 - HWPS 220 kV Switchyard Redevelopment, Stage 4 BCR

The major project cost increases tabled above are a result of delays and stoppages that this project incurred over the past five years since the business case was submitted for approval. In this time, a number of reviews have been completed around the future need for the HWPS 220 kV switchyard following the closure of Hazelwood Power Station. The planning review considered network reconfiguration options, including whether we still require a 220 kV switching station at HWPS and significant engineering resources were used in these reviews. The original labour rates used the business case have also increased over the five years since the business case was approved.

Table 4.1: Original Approved Business Case Project Expenditure Forecast

Project Expenditure Forecasts (\$'000s)	2014 / 15	2015 / 16	2016 / 17	2017 / 18	2018 / 19	Total
Design	-	1,400	-	-	-	1,400
Internal Labour	126	211	473	396	221	1,427
Materials	-	-	3,795	2,596	1,332	7,723
Plant & Equipment	-	-	360	370	190	920
Contracts	-	-	2,570	4,533	1,945	9,048
Meter Costs	-	-	-	-	-	-
Other	-	-	412	423	217	1,053
Project P50 Direct Expenditure	126	1,611	7,611	8,318	3,905	21,570
Finance Charges	1	67	216	121	88	493
Project P50 Direct & CFC's	127	1,678	7,827	8,438	3,993	22,063
Delivery Risk Adjustment =(P90-P50)	6	83	391	427	200	1,107
Project P90 Direct (incl risk adj) & CFC's	133	1,761	8,218	8,865	4,193	23,170
Overheads	9	113	533	532	273	1,510
Total CAPEX for Approval	142	1,873	8,751	9,447	4,467	24,680
Operating Costs	-	-	-	-	-	-
WDV (Written Down Value) of Assets to be retired	-	-	-	-	-	-
Total Estimated Expenditure for Approval	142	1,873	8,751	9,447	4,467	24,680

Table 4.2: New Revised Business Case Project Expenditure Forecast

PROJECT EXPENDITURE FORECASTS	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	TOTAL
DESIGN	\$0	\$900,000	\$150,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$1,350,000
INTERNAL LABOUR	\$222,056	\$222,056	\$333,083	\$222,056	\$444,111	\$444,111	\$518,130	\$444,111	\$111,028	\$2,960,741
MATERIALS	\$0	\$979,045	\$0	\$0	\$0	\$0	\$1,958,090	\$2,937,135	\$1,958,090	\$7,832,361
PLANT & EQUIPMENT	\$0	\$54,849	\$219,396	\$219,396	\$219,396	\$219,396	\$210,255	\$109,698	\$27,425	\$1,279,810
CONTRACTS	\$0	\$220,068	\$880,273	\$880,273	\$1,613,835	\$1,760,547	\$2,640,820	\$1,980,615	\$293,424	\$10,269,856
METER COSTS	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
OTHER - RISK ALLOWANCE	\$0	\$21,096	\$84,383	\$84,383	\$84,383	\$84,383	\$84,383	\$49,223	\$0	\$492,232
PROJECT DIRECT EXPENDITURE P(50)	\$222,056	\$2,397,114	\$1,667,135	\$1,456,108	\$2,411,724	\$2,558,437	\$5,461,677	\$5,570,783	\$2,439,967	\$24,185,000
OVERHEADS	\$15,544	\$167,798	\$116,699	\$101,928	\$168,821	\$179,091	\$382,317	\$389,955	\$170,798	\$1,692,950
FINANCE CHARGES (IDC)	\$5,041	\$69,925	\$190,446	\$280,399	\$394,358	\$406,587	\$452,102	\$618,517	\$185,041	\$2,600,416
PROJECT DIRECT EXPENDITURE (SAP)	\$242,640	\$2,634,836	\$1,974,281	\$1,838,435	\$2,974,903	\$3,144,115	\$6,296,097	\$6,577,255	\$2,795,805	\$28,478,367
MANAGEMENT RESERVE [P(90)-P(50)]										\$1,209,250
TOTAL EXPENDITURE FOR APPROVAL (Including P(90) Risk)	\$242,640	\$2,634,836	\$1,974,281	\$1,838,435	\$2,974,903	\$3,144,115	\$6,296,097	\$6,577,255	\$2,795,805	\$29,687,617

Project Expenditure for approval (nominal)	First 5 years					Lifecycle
	2019	2020	2021	2022	2023	Total
Direct Capital expenditure	8,276.9	2,609.6	5,682.3	5,911.8	2,641.1	25,121.7
Overheads	665.6	150.1	326.7	339.9	151.9	1,634.2
Capitalised Finance Charges	1,340.8	63.3	137.9	143.5	92.6	1,778.2
Project Delivery Budget (SAP Capex budget)	10,283.4	2,823.0	6,147.0	6,395.2	2,885.6	28,534.1
Management Reserve	-	-	-	-	1,308.9	1,308.9
Total CAPEX for Approval (incl risk, CFCs & OHs)	10,283.4	2,823.0	6,147.0	6,395.2	4,194.5	29,843.1
Operating Expenditure for approval (Project Opex)	-	-	-	-	-	-
Written down value of assets retired/sold	-	-	-	-	-	-
Total Estimated expenditure for approval (nominal)	10,283.4	2,823.0	6,147.0	6,395.2	4,194.5	29,843.1

TD-0003456 - HWPS 220 kV Switchyard Redevelopment, Stage 4 BCR

5. OPTIONS

Option	Description Summary
BAU	BAU: Complete current works, forego remaining scope.
1	Complete the project under the full scope of works.
2	N/A

Table 5.1: Analysis of investment options

Analysis of investment options (\$'000 - Present Value)	Capex	Opex	Total Financial Costs	Potential Costs	Other Economic Costs & (Benefits)	Total PV Cost	PV Cost Ratio (compared to BAU)
BAU	-	-	-	-	74,089.0	74,089.0	1.00
Option 1	25,250.5	-	25,250.5	-	17,957.9	43,208.5	0.58
Option 2	-	-	-	-	-	-	-

Net Present Value of Cashflows (Financial Analysis)

WACC Reference date

Mar-19

Investment Option	NPV of cashflows	IRR	Payback period (yrs)
BAU	-	-	-
Option 1	5,379.0	5.7%	32
Option 2	-	-	-

5.1 Business as usual

The business as usual option presents the asset failure risk if we do not proceed with the remaining part of the project. This may result in the business not being able to find another project to use the procured plant, in which case it will have to be used as spares or possibly not being able to capitalise the cost of the procured plant.

Capex and Opex	<p>All plant and equipment have been procured, are on site, and are ready to be installed. The installation cost (capex) of the project can be avoided if we do not proceed with the project. This however means that these new assets cannot be put into service and we may have to find another project that could use it.</p> <p>O&M challenges presented by the large bulk oil 220 kV CBs will remain with HWPS the only remaining station with this circuit breaker technology.</p> <p>Discontinuing the project will result in potentially \$10M being written off to Opex for costs incurred to date.</p>
Community Costs & Benefits	<p>The asset failure risk reduction that will be achieved by replacing the aging assets will not be achieved.</p>

TD-0003456 - HWPS 220 kV Switchyard Redevelopment, Stage 4 BCR

5.2 Preferred option – Complete HWPS Switchyard Redevelopment

This option completes the redevelopment of the HWPS Switchyard and addresses the identified asset failure risks.

Capex and Opex	Incremental capex is around \$13M for the installation of procured plant and equipment. Changes in Opex is negligible
Community Costs & Benefits (Regulated projects)	Asset failure risk reduction of around \$2.5M in the first year that grows to around \$11.7M in Year 17. Asset failure risk consists of market impact cost as a result of involuntary load shedding and generator constraints, safety risk, environmental risk and collateral risk.
Incentive Benefits (Electricity only)	Not applicable

6. SCHEDULE AND DELIVERABLES IMPACT

Project XC28 (Now TD-3456) Business Case was submitted in December 2014 for completion by 31/10/2018 (Roughly 4 years). After this, Engie announced the closure of HWPS, which resulted in all projects associated with HWPS being put on hold while the implications of the closure were assessed.

Current works are for Stage 4, confirming Stage 1 to 3 have been completed prior to HWPS closing. An interim CCR1 (Time only) was submitted 5/7/2018, recognising the Business Case completion of 31/10/2018 was not possible. This CCR was to allow enough time to complete re-design, scope & tender functions and makes provision for the change that network outages may not always be possible when needed given the tight supply demand situation in Victoria.

Table 6.1: Impact on Milestone Date

Key Milestone	Original Approved BC Date	New Revised BC Date
Control Estimate Complete	4/12/14	6/06/19
Commissioning Readiness Complete	31/10/18	31/05/2020
Penalty / Regulatory Commencement	N/A	N/A
Project Completion Date	31/01/19	31/08/22

TD-0003456 - HWPS 220 kV Switchyard Redevelopment, Stage 4 BCR

7. BENEFITS IMPACT

Benefits Realisation cost centre Adrian Hill - 13840

Item #	Benefit Category	Description of Benefit Change (include assumptions & dependencies)	New Benefit Target Outcome (Measurable outcomes, aligned to Strategic Objectives)	Metric Used to measure Benefit (calculation approach and data source):	Date of benefit realisation e.g. Stage Gate 4 / Milestone	Business Benefit Owner
1	Safety	Delay in full benefit realisation date, although benefits will be realised progressively through phase completion of the work. Reduced asset explosive failure risk and safer O&M work practices	All bulk oil 220 kV circuit breakers on the network will be replaced with modern circuit breakers following the completion of this project.	Maintain or improve RIFR at HWPS 220kV Switchyard	5/2022	[C-C]
2	Financial	Delay in full benefit realisation date, although benefits will be realised progressively through phase completion of the work.	Opex savings through replacement of bulk oil (aspro type) CBs with modern SF6 CBs. The opex saving is the incremental cost saving for replacement of these two types of CBs. Transmission Incentive Revenue. AEMO market studies have quantified the consequence of an asset (CB) failure. The market impact cost (MIC) includes generation and electricity consumer economic impacts.	Opex savings of \$165k Transmission Incentive Revenue of \$295k	5/2022	[C-C]
3	Risk Mitigation	No change. Remove asset failure risk progressively to 2022.	Replace all aging transmission assets at HWPS 220kV Switchyard which will reduce the likelihood of involuntary load shedding as defined in amount of expected unserved energy	Reduced MIC penalties for the Transmission Network (unmeasurable).	5/2022	[C-C]

TD-0003456 - HWPS 220 kV Switchyard Redevelopment, Stage 4 BCR

8. RISKS IMPACT

8.1 Project delivery risk (known)

Project Risk	What could occur?	Consequence Rating 1-5*	Likelihood Rating (Almost Certain ~ Rare)*	Current Risk Rating A-E	Actions and controls in place to manage/reduce risk	Target Risk Level A-E*
Inclement weather	Delays in installation	3	Likely	B	Works planning and scheduling of resources	C
Network outage restrictions	Project delays	3	Likely	B	Works planning and scheduling of outages	C
Resource shortages	Project delays	3	Likely	B	Works planning and scheduling of resources	C

* Refer to the Risk Assessment Criteria Summary document and the Risk Management Policy and Framework 2018 on [ECMLink](#)

8.2 Other risks

None

9. OTHER IMPACTS

Table 9.1: Further impact information

Regulatory Impact	None
Safety Impact	Reduced asset failure risk and removal of potentially unsafe maintenance work practice – working in confined spaces – associated with 220 kV bulk oil circuit breakers
Customer (external) Impact	Improved supply security and reduced generator constraints
Resource Impact	Contractors and internal crews have been engaged and are ready to proceed with the last stage of the project. Any delays will result in increased cost as a result of finance charges and the requirement to renegotiate the installation contract.
Commercial Impact	Allow assets to be commissioned and included in RAB and asset register
Business Impact	Positive outcome once assets are included in RAB and asset register
Change Impact (Tech only)	Not applicable

TD-0003456 - HWPS 220 kV Switchyard Redevelopment, Stage 4 BCR

10. FINANCIAL ASSESSMENT

10.1 New Capex Breakdown table

Capex Breakdown (incl mgmt reserve - nominal)	First 5 years					Lifecycle Total
	2019	2020	2021	2022	2023	
Design	167.5	51.0	52.0	53.1	54.1	377.7
Internal Labour	773.1	453.0	539.1	471.3	120.2	2,356.6
Materials	-	-	2,037.2	3,116.9	2,119.5	7,273.6
Plant & Equipment	7,202.0	223.8	218.7	116.4	29.7	7,790.6
Contracts	134.3	1,795.8	2,747.5	2,101.8	317.6	7,097.1
Meter Costs	-	-	-	-	-	-
Risk	-	86.1	87.8	52.2	-	226.1
Other	-	-	-	-	-	-
Management Reserve	-	-	-	-	1,308.9	1,308.9
Total Capex	8,276.9	2,609.6	5,682.3	5,911.8	3,950.0	26,430.7

10.2 New Opex Opex Breakdown table

N/A

10.3 Budget Impact

N/A

10.4 NPV Assessment

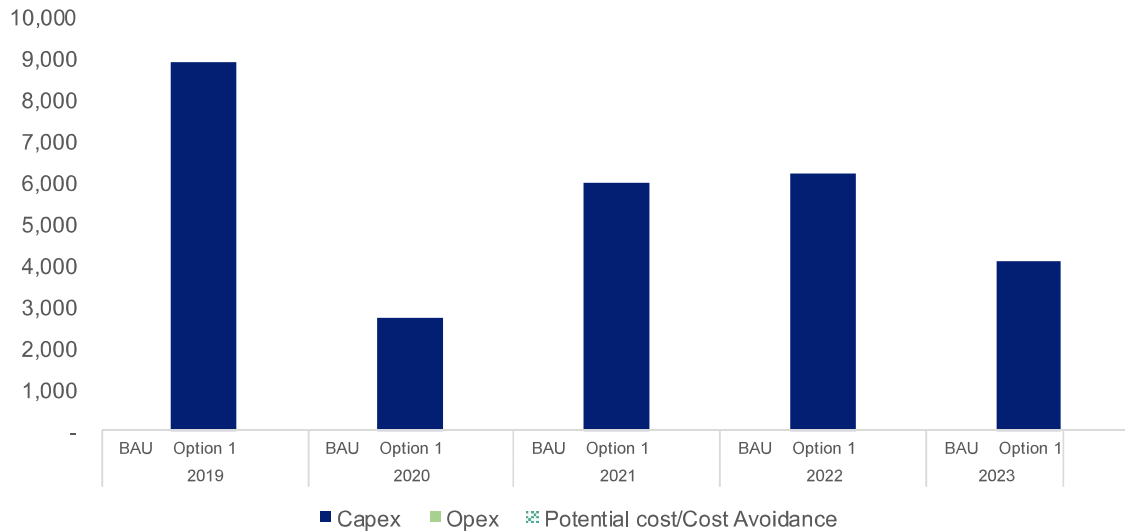
NPV buildup all options

	BAU	Option 1	Option 2
Regulated Revenue			
Return on assets	-	23,583.0	-
Regulatory Depreciation	-	7,455.5	-
Opex allowance	-	-	-
Efficiency Benefit	-	-	-
Tax Allowance	-	3,030.7	-
Imputation credits	-	(1,212.3)	-
Total Regulated Revenue	-	32,856.9	-
Proceeds from Sale of replaced assets	-	-	-
Unregulated Revenue	-	-	-
Opex	-	-	-
Capex	-	(25,179.8)	-
Tax Payable	-	(2,301.7)	-
NPV	-	5,375.6	-

TD-0003456 - HWPS 220 kV Switchyard Redevelopment, Stage 4 BCR

BAU vs Option 1 Least Cost Analysis - 5 year view

Nominal



10.5 Corporate accounting considerations

10.5.1 Changes to Asset Retirements

N/A (All assets that are being replaced have been written down and have a zero book value)

10.5.2 Changes to Contributed (Gifted) Assets

N/A

10.5.3 Changes to assets to be created

Asset	Qty.	Value	Regulatory Life
Circuit Breaker	7	\$9.7M	45
Current Transformer	9	\$3.5M	45
Voltage Transformer	9	\$2.9M	45
Disconnectors	39	\$11.1M	45
Total		\$28.5M	

10.6 Accounting Review

N/A

Appendix A

A.1 Original Business Case and NPV



XC28 Approved
Business Case.pdf



XC28 HWPS CB
Stage 4 NPV V010.xls

A.2 Scope of works



SOW ISP Mar
2019.pdf

A.3 Detailed Cost and Benefit Assumptions and NPV



XC28 Economic
Evaluations V0.16.xls



HWPS Stage 4
Business Case Revisio











TD-0003456 HWPS 220kV Redevelopment Stage 4 BCR - Final


Final Audit Report


2020-05-14


Created:	2020-02-25
By:	Portfolio Management & Review (portfoliomanagementandreview@ausnetservices.com.au)
Status:	Signed
Transaction ID:	CBJCHBCAABAAOwxq1eoqG9x6rbanY_-_bx4x-hw9AJZ

"TD-0003456 HWPS 220kV Redevelopment Stage 4 BCR - Final" History


-  Document created by Portfolio Management & Review (portfoliomanagementandreview@ausnetservices.com.au)
2020-02-25 - 2:37:39 AM GMT- IP address: 203.14.70.52
-  Document emailed to [C-I-C] for signature
2020-02-25 - 2:55:40 AM GMT
-  Email viewed by [C-I-C]
2020-03-02 - 7:39:29 AM GMT- IP address: 203.14.70.52
-  Document e-signed by [C-I-C]
Signature Date: 2020-03-02 - 7:43:04 AM GMT - Time Source: server- IP address: 203.14.70.52
-  Document emailed to [C-I-C] for signature
2020-03-02 - 7:43:06 AM GMT
-  Email viewed by [C-I-C]
2020-03-02 - 9:16:40 PM GMT- IP address: 203.14.70.52
-  Document e-signed by [C-I-C]
Signature Date: 2020-03-02 - 9:24:20 PM GMT - Time Source: server- IP address: 203.14.70.52
-  Document emailed to [C-I-C] for signature
2020-03-02 - 9:24:24 PM GMT
-  Email viewed by [C-I-C]
2020-03-02 - 10:11:21 PM GMT- IP address: 203.14.70.38
-  Document e-signed by [C-I-C]
Signature Date: 2020-03-02 - 10:12:58 PM GMT - Time Source: server- IP address: 203.14.70.52


 Document emailed to [C--C] for signature
2020-03-02 - 10:13:00 PM GMT


 Email viewed by [C--C]
2020-03-03 - 0:27:32 AM GMT- IP address: 203.14.70.38


 Email viewed by [C--C]
2020-04-01 - 7:04:33 AM GMT- IP address: 49.185.8.255


 Document e-signed by [C--C]
Signature Date: 2020-04-02 - 2:10:50 AM GMT - Time Source: server- IP address: 49.185.8.118

 Document emailed to [C--C] for signature
2020-04-02 - 2:10:53 AM GMT


 Email viewed by [C--C]
2020-04-02 - 2:32:33 AM GMT- IP address: 144.136.214.79


 Document signing delegated to [C--C] by [C--C]
2020-04-02 - 3:38:06 AM GMT- IP address: 144.136.214.79

 Document emailed to [C--C] for signature
2020-04-02 - 3:38:06 AM GMT


 Email viewed by [C--C]
2020-04-04 - 6:35:12 AM GMT- IP address: 175.34.124.121


 Document e-signed by [C--C]
Signature Date: 2020-04-04 - 6:44:03 AM GMT - Time Source: server- IP address: 175.34.124.121

 Document emailed to [C--C] for signature
2020-04-04 - 6:44:04 AM GMT


 Email viewed by [C--C]
2020-04-04 - 6:48:29 AM GMT- IP address: 110.144.9.40

 Document e-signed by [C--C]
Signature Date: 2020-04-04 - 6:53:11 AM GMT - Time Source: server- IP address: 110.144.9.40

 Document emailed to [C--C] for signature
2020-04-04 - 6:53:13 AM GMT

 Email viewed by [C--C]
2020-04-04 - 10:58:39 AM GMT- IP address: 101.173.135.34

 Document e-signed by [C--C]
Signature Date: 2020-04-04 - 10:55:00 PM GMT - Time Source: server- IP address: 101.173.135.34

 Document emailed to [C-]C] for signature

2020-04-04 - 10:55:03 PM GMT

 Email viewed by [C-]C]


2020-04-04 - 11:54:19 PM GMT- IP address: 1.143.56.177

 Email viewed by [C-]C]

2020-05-05 - 7:31:19 AM GMT- IP address: 1.143.57.181

 Email viewed by [C-]C]

2020-05-14 - 11:06:13 PM GMT- IP address: 203.14.70.38

 Document e-signed by [C-]C]

Signature Date: 2020-05-14 - 11:35:13 PM GMT - Time Source: server- IP address: 203.14.70.38

 Signed document emailed to [C-]C]

2020-05-14 - 11:35:13 PM GMT