

UPDATE – MODELLING OF ASSET REINVESTMENT SCENARIOS

Asset Reinvestment Review

26 October 2022



Acknowledgement

Powerlink acknowledges the Traditional Owners and their custodianship of the lands and waters of Queensland and in particular, the lands on which we operate. We pay our respect to their Ancestors, Elders and knowledge holders and recognise their deep history and ongoing connection to Country.

Recap / background

- Current approach consists of refit work that is expected to achieve a life extension of 15 years across an entire built section bundled in single upfront intervention
 - combination of condition driven works and compliance driven works
 - adopts a hybrid risk/deterministic approach
- Review concerned with considering whether there is an alternative approach to defining assets and/or bundling works that drives a materially better outcome for customers
- The working group was keen to consider the outcome (NPV and capex/opex trade-offs) of alternative asset definitions and bundling approaches
 - disaggregate built section into components
 - unbundle works, such that works only undertaken in year that condition trigger expected.

Case study assumptions

Refit of Ross to Chalumbin 275kV transmission line selected as case study

- The Ross to Chalumbin refit project is representative of wider network (& extensive condition data available)
- The refit work is proposed to be undertaken from 2026 and extend the useful life of the asset for 15 years
- Costs that extends the useful life of an asset are capitalised
- Returns calculated over 30 years – based on current regulatory life for ‘refit assets’
- No allowance included for update of business systems and processes to implement change in asset definition
- Options compared based on the net present cost (NPC) of the total return – both capex and opex.

Asset definition

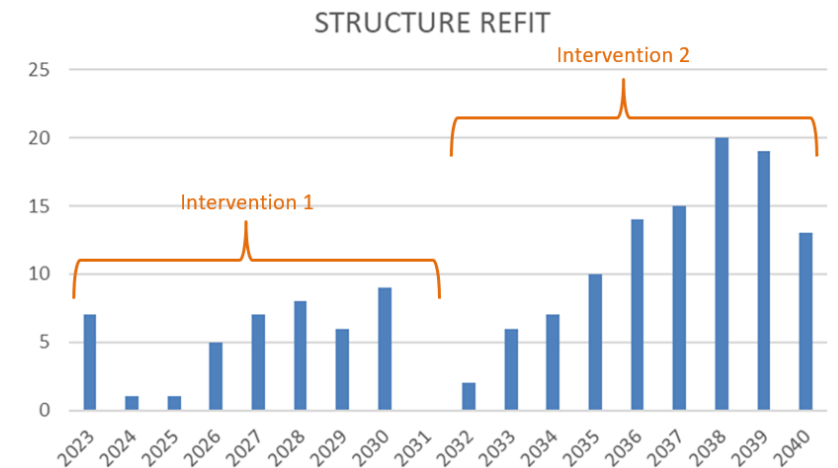
Two alternative approaches considered for definition of assets

- Current approach
 - asset defined as an entire built section, i.e. all structures, conductors, insulators and overhead earthwire (OHEW) elements within a built section defined as a single asset
- Alternative approaches to disaggregate asset definitions
 - each asset type within a built section is one asset, i.e. structures, conductors, insulators and OHEW elements within a built section defined as a separate asset (4 assets in a built section)
 - each individual asset component within a built section is one asset, i.e. every structure, conductor span, insulator string and OHEW span defined as a separate asset (around 3,000 assets in our case study).

Definition of intervention scenarios

Asset Class	Total for Built Section	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
STRUCTURE REFIT	528	7	1	1	5	7	8	6	9	0	2	6	7	10	14	15	20	19	13
CONDUCTOR	1050																		
CONDUCTOR HARDWARE	1050		1050																
OHEW CONDUCTOR	1031	0	0	0	0	326	0	0	0	0	0	0	0	0	0	0	0	0	0
OHEW HARDWARE	1160	0	0	0	0	352	1	0	0	0	0	10	0	0	0	0	0	0	0
INSULATOR STRINGS	3612	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	145	212	607

- Consider four intervention scenarios over 15 year period
 - Scenario 1: single upfront bundled intervention
 - Scenario 2: two bundled interventions (observed structure condition)
 - Scenario 3: three bundled interventions (nominal 5 years)
 - Scenario 4: annual interventions based upon expected condition.



Derivation of fixed cost / unit rates

- Estimated costs broken down and assessed
 - allocated between fixed costs (establishment / flag fall) and variable costs (unit rates)
 - allocated between components of asset (disaggregated assets)
- Collated to derive unit rates for model input.

Results of modelling

Net present cost (NPC) by asset class

	Built section (BS) [base case]	Asset type (4 assets in BS)	Variance to base case	Asset component (3000 assets in BS)	Variance to base case
Single bundled intervention	\$24.8m	\$24.8m	-	\$24.8m	-
Two bundled interventions		\$23.4m	(\$1.4m)	\$23.4m	(\$1.4m)
Quinquennial bundled interventions		\$23.0m	(\$1.8m)	\$23.0m	(\$1.8m)
Annual interventions		\$34.6m	\$9.8m	\$31.7m	\$6.9m

Observations / preliminary outcomes

- There appears no material benefit to customers with the alternative options modelled
 - positive NPC outcomes under two scenarios, but (unmodelled) cost to implement may reduce and possibly exceed the benefit
 - alternative bundling approaches will have additional (unmodelled) impacts upon resource and outage requirements
 - on a portfolio wide basis, there would be an increase in capex and a reduction in opex due to the accounting treatment of insulators (outside of refit projects)
- Assumed need for compliance works (climbing bolts, etc.) on structures not requiring condition intervention under review – expected to reduce costs across portfolio of refit works.

Next steps

- Review alternative intervention approaches across portfolio – impacts on resources, outages and capex/opex trade-offs
- Independent review into hybrid risk/deterministic approach, and alignment with AER guidelines
- Anticipated timeframes (for discussion):
 - independent review December 2022
 - complete modelling January 2023
 - draft report February 2023 – what should this look like?
 - final report April 2023.



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