Meeting Date	Location
7 February 202	Hybrid – Powerlink Offices/Teams meeting

Attendees

Name	Organisation
Bev Hughson	Darach Energy Consulting Services
Andrew Broadbent	CS Energy
Albert Tong	AER
Mark Grenning	Energy Users Association Australia
Mark Henning	Energy Consumer Advocate
Chris Hazzard (absent)	St Vincent de Paul
Jenny Harris	Powerlink
Gerard Reilly	Powerlink
David Gibbs	Powerlink
Nathaniel Dunnett (absent)	Powerlink
Lutfiye Manli (absent)	Powerlink
Roger Smith	Powerlink
Paul Ascione	Powerlink
Jules Taylor	Powerlink

Meeting Minutes & Actions

Comments (C), questions (Q) and response (R)

Meeting commenced with acknowledgement of country and traditional owners Jagera and Turrbul people, followed by a recap of how we arrived at this point.

Working group activity to date:

- March 2022 – discussed review scope
- April – Glossary of terms, current approach overview, deep dive into Ross to Chalumbin
- May – Confirmed scope, built section definition, review focus areas
- June – Site visit to Rocklea Tower Farm and Goodna tower site
- July – Strawman outline of five options for the breakdown of built sections:
    1. Powerlink current approach
    2. Environment
    3. Fixed length
    4. Assets defined based on function (structure, insulator, conductor etc)
    5. Accessibility

- October – Use of Ross to Chalumbin case study to compare three approaches:
    1. Current approach
    2. Each asset type with a built section is one asset – i.e. four assets per built section
    3. Each individual asset component is one asset – every structure, conductor span, insulator etc. (more than 3,000 assets in case study built section)

Q. Can you refresh our memories about where the current thinking is around accessibility criteria?

R. This was defining a built section through common accessibility. When we went through that in analysis is just wasn't a feasible way of grouping work together. We acknowledged that accessibility is a significant contributing factor, and definitely something that needs to be considered but there wasn't a practical way to subdivide a built section using that criterion. This is primarily due to the effects of erosion over time, leading to the need to redefine access along a transmission line.

Alternative Building Approach

Overview of our current approach – which involves works on built section to lift the expected life of that built section an additional fifteen years. This approach is cost effective and provides benefits in terms of resources and practicality of delivery. But it can give the perception that we're doing work earlier than we need to. We've attempted to create a graphic that explains the current process and the alternative approach more clearly.

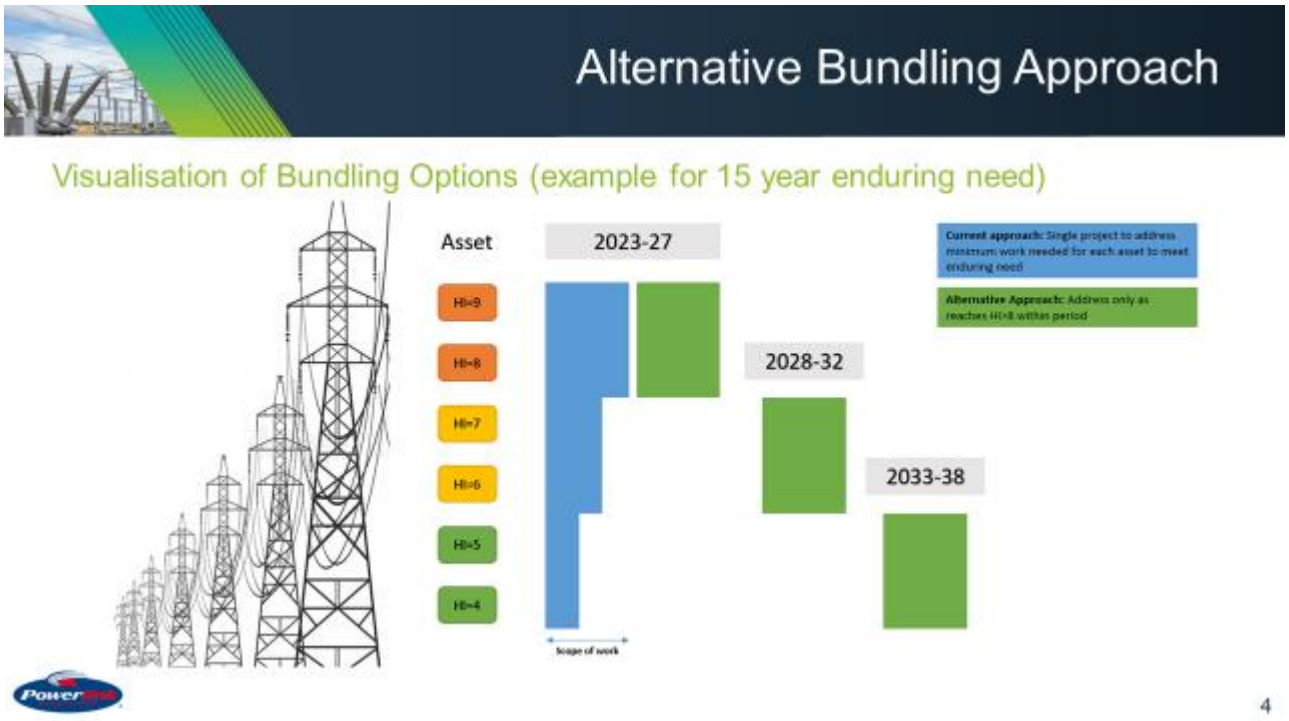
When considering our assets, HI-8 is where condition is getting to a stage where we need to intervene and do some work on that asset. When we have identified that a built section is forecast to reach an HI-8, we commence estimating based upon a range of assumptions (number of towers requiring member or bolt replacement, insulator replacement, etc) to obtain an initial estimate of the refit works for forward planning purposes. As an investment decision approaches, we undertake a full condition assessment to understand what the actual condition is of all the individual structures and components, that are part of that built section. From this, we create a more realistic picture of what is required and a more accurate estimate.

The blue shading on the graphic illustrates the current approach and illustrates that whilst the built section is at HI-8, the individual components are at various condition levels due to the nature of the way things age. Those components with the HI rating of 8 and 9, need to be addressed first to bring them back to serviceable condition. Those structures assessed as HI-6 and 7 would typically be expected to reach HI-8 within the nominal 15-year life extension based on aging curves. So ultimately you will do quite a bit less work, for example you might replace a few bolts or a couple of structural members, which means you won't need to come back in a few years' time to replace them. Then you have HI-4 and 5 which will require minimal work such as touch up painting. The actual scope of work is very much tailored to the individual components. The width of the blue shaded area represents the 'scope of work', which is intended to show you do more work on the HI-8 and 9 components, less on the HI-6 and 7s and minimal work on the HI-4 and 5s.

However, the alternative approach (represented by the green blocks) involves just doing work on the HI 8 and 9s upfront. That will probably provide 5-7 more years until we need to intervene again. However, when you do return it is likely that the condition has deteriorated to HI-8, based on aging curves, and you will probably have the same amount of work to complete that was done for the HI-8 and 9s previously (represented by the deferred blocks of works being same width as the original bocks of work). By not doing a smaller amount of work upfront, you have to go back a little later and do more work to address the condition at that time. This is similar with the HI-4 and 5s.

However, the timing is going to move in terms of where that intervention takes place, based on the actual age and condition of the equipment.

This is a graphic representation of what we've been talking about. It illustrates that there is work being undertaken, strictly speaking, before it was due from a condition driver. However, the reason was to address the built section to ensure you had a 15-year timeframe before elements came to an unacceptable condition, and you had to intervene again. The alternative is deferring that work. The benefit of deferring the work is that it does offer flexibility. Because it's all about modelling, and modelling is inherently an approximation of outcomes, you may get some condition triggers earlier or you may get some a little later, so by deferring the work you can go back at a later stage and be confident that you are doing only the work that is needed. That could be more or less than what you're anticipating.



C: Thank you that graphic and explanation was really helpful.

Q: How do you address the risk that a built structure that is HI-6 and 7, gets to HI-8 before 2028? If you assess today and it is not HI-5 or 6, you're not going to do an inspection for a long time are you?

R. You won't do a detailed condition assessment, but you would continue with your routine inspection approach. If a defect is found during a routine inspection it would be addressed through maintenance (opex). There is a possibility that you will miss a component reaching HI-8, but you have done a full condition assessment at the initial intervention, so will minimise the risk of serious condition issues arising within the near term. It may be that it deteriorates quicker than what you anticipate, but if it's an element on a tower it should be an acceptable risk.

Economic Modelling – Case study Ross to Chalumbin 275kV refit

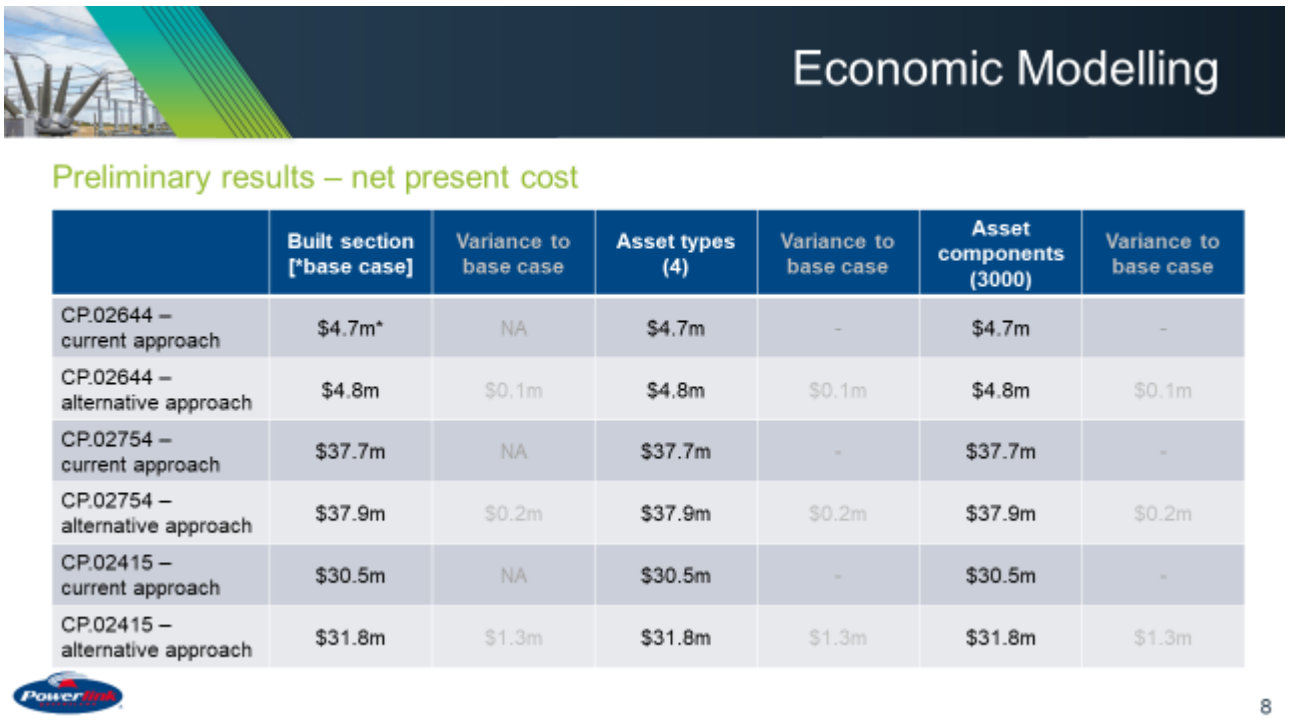
- Considered four intervention scenarios over 15 year period
  - Scenario 1: single upfront bundled intervention (base case)
  - Scenario 2: two bundled interventions (observed structure condition)

- Scenario 3: three bundled interventions (nominal 5 years)
- Scenario 4: annual interventions based upon expected condition

Our analysis showed there was no material difference in the majority of cases in terms of how you defined your asset. Applying this approach and these costs to the different types of asset meant that we allocated work as either Capex or Opex in line with our cost allocation methodology. What we found is that it made no material difference to the outcome overall. What did make a difference was the bundling of the work. There is some reduction when you look at the number of interventions. However, as expected annual interventions are the most expensive.

Preliminary results – input to further analysis

- Significant disadvantage in unbundling works completely and implementing annual interventions
  - No further consideration of this option
- Economic outcomes for two interventions or 5 yearly intervention similar – likely same scenario impacted by practicality of timing
  - Model two interventions only; timing typically 5-7 years apart
- Repeat economic analysis for additional project scenarios
  - Calliope River to Wurdong Tee (CP.02644)
  - Davies Creek to Bayview Heights (CP.02754)
  - Greenbank to Mudgeeraba (CP.02415)



When we look at different asset definitions there is no change to the outcomes. Asset definition is confirmed through the modelling as not having a material impact on the outcome. What it does show is that when you go to the alternative approach of having two interventions instead of having one, there is actually a very slight increase in the net present cost across those.

Definition Net present cost (need to insert and update glossary doc)

Q. Two questions – what discount rate do you use (Is that the same as what was used when the Powerlink reset document was prepared)? Second what sensitivities have you used in this assessment because the solutions are so tight that change in economic conditions can swing it one way or another?

R. We can circulate our key assumptions subsequent to this meeting. My understanding is that the discount rate was updated, so it wasn't what was used in the reset proposal. In terms of sensitivities, we looked at the unit rates of each individual project - these were very different because of the practicalities (length of built section, access, locality). However, the estimates are still at a concept level. They were generated from a unit rate based on known factors about access and other issues but not on detailed condition assessment information. What we do have is detailed unit costs for the Ross to Chalumbin case study, so we applied these across the board. We also considered how far you need to delay the second intervention in order to get the net present cost to become zero (no change to the base case). We found that it was approx. two years - so if you delay the second intervention by two years it becomes NPC neutral. We will ensure we do a little bit more work on the discount rates to cover off on any impacts to the outcomes as well. We will close that loop and get back to you after the meeting.

Q. Was that the result you expected?

R. There is no single most efficient option for all cases – that's what we've found through the modelling. What it indicates is that there is a need to look at the alternatives. It is not just assumed the fifteen-year life extension is the correct way. It's more a case of how we should model the two and do a comparison when we come to the investment decision.

Results of Economic Modelling

- No single most efficient option for all cases – suggests need to compare single and potential multiple staged approach
- Asset definition made no difference to economic outcomes in almost all cases
- Highest observed variance in net present cost approx. 5%
    - No material difference between modelled approaches
    - Potential benefit to defer works for longer built sections
    - Improved view of trade-offs after initial condition assessment

Q. How does the dollar value of a risk (eg. outage) feed into the economic analysis?

R. That comes back to risk versus compliance. Let's take that one on notice and come back to you.

Preliminary Recommendations

- Only carry out compliance works on structures where condition-based work is to be performed
- Include alternative bundling approach (multiple interventions) in addition to the current approach for lines refit projects
    - No material change in risk providing projects target completion of HI8 structures in a timely fashion
    - Enables a more flexible delivery and resourcing model through staging of projects based on risk
- No change proposed to built section definition.

Q. Have you spoken to contractors about their preference in terms of bundling given the constraints around resourcing are likely to continue into the foreseeable future?

R. We have a panel of contractors in the transmission line space and we're engaging with all of them looking at this very issue.

Next Steps

- Apply to RIT-T assessments for future refit projects with immediate effect to trial approach
  - Revised approach to compliance actions within built section
  - Consideration of both current and alternative bundling approach in economic assessment based upon detailed condition assessment and estimates.
- Draft and publish ARR report
- Review outcomes one year after report published.

High Level Report Structure

- Executive Summary
- Background
- Engagement Process
- Existing Approach for Reinvestments
- Analysis of Options
- Findings/Discussion and working group insights
- Recommendations
- Future Review

Actions from meeting

Action	Responsible	Timing
Share assumptions/sensitivities used in the economic modelling with the working group, and outcomes	Powerlink	ASAP
Include additional sensitivities around discount rate used in modelling and share with the group	Powerlink	ASAP
Confirm how risk (cost) is incorporated into the refit decision making (timing/scope/cost of works).	Powerlink	ASAP
Draft report for working group review	Powerlink	April 2023