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Seed Advisory

Deep Dive Workshop Two – Summary Report

AusNet Services Transmission Revenue Reset 2023 –
2027

6 October 2020

Network Capital Expenditure



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Disclaimer

This report is only a summary of key items discussed at the deep dive workshop held on 11 August 2020.

The information in this report is not necessarily reflective of the views of each attendee at the workshop, AusNet Services or Seed Advisory.



1. Introduction

1.1. Background

AusNet Services owns and operates the regulated Victorian electricity transmission network that transports electricity from where it is generated, through terminal stations and high-voltage transmission powerlines across the state, to Victoria's five lower-voltage distribution networks. The transmission network covers an area of approximately 227,600 square kilometres, serving a population of over 5.9 million people, or more than 2.1 million households and businesses.

Regulated electricity transmission network businesses must periodically (typically every five years) submit a Revenue Proposal which outlines their plans and proposed expenditure to the Australian Energy Regulator (AER) for assessment. AusNet Services is currently developing its Revenue Proposal for the five-year period from 1 April 2022 to 31 March 2027. AusNet Services will be submitting its Revenue Proposal to the AER by 31 October 2020.

As part of developing its Regulatory Proposal, AusNet Services is undertaking an extensive customer engagement program. One component of this engagement program is a series of 'deep dive' workshops with attendees including customer representatives, consumer advocates, AER representatives, consumer challenge panel representatives and other stakeholders. Many of these stakeholders are members of AusNet Services' Transmission Revenue Reset Customer Advisory Panel, which has been meeting regularly during the last 18 months.

The deep dive workshops are designed to:

- share information on AusNet Services' Revenue Proposal;
- consult on and enable open and frank discussion of key elements of AusNet Services' plans, with a focus on issues where customer feedback may inform the positions taken in AusNet Services' Revenue Proposal; and
- enable AusNet Services to consider the feedback and views of attendees while developing its Revenue Proposal and plans.

AusNet Services engaged Seed Advisory to assist in the preparation and facilitation of these workshops and to develop a summary report for each workshop.

At the time of publishing this report, AusNet Services aims to hold or have held the following workshops:

- Workshop One: Operating Expenditure (*held 30 June 2020*);
- Workshop Two: Network Capital Expenditure (*held 11 August 2020 and the focus of this report*); and
- Workshop Three: Information Technology and Lines Programs Capital Expenditure (*scheduled 14 September 2020*).

In addition to its deep dive program, AusNet Services has held or will hold the following briefing sessions that are aimed at informing stakeholders:

- Briefing Session One: Overview of AusNet Services' transmission plans and the outlook for transmission charges during the 2023-27 regulatory period, to provide stakeholders with context for the deep dive workshops (*held 26 June 2020*); and



- Briefing Session Two: Overview of AEMO’s Final 2020 ISP, including its implications for transmission costs and AusNet Services plans during the next regulatory period (*joint AusNet Services-AEMO session, held 26 August 2020*).

There will be further workshops, briefing sessions, Customer Advisory Panel meetings and one-on-one consultations held after the Revenue Proposal is submitted on 31 October 2020.

1.2. Purpose of this report

This report summarises the key items of discussion from Workshop Two on Network Capital Expenditure held on 11 August 2020 via video conference using Microsoft Teams. The workshop attendees and the organisations they represent are included in Appendix A and the complete agenda for the workshop is included in Appendix B.

In brief, the workshop agenda covered five broad areas:

- A recap of the key outcomes from Deep Dive Workshop One;
- An overview and discussion of the capital expenditure forecasts and proposed major station projects;
- An overview and discussion on the economic assessment framework for major station projects;
- A discussion on two case studies of proposed major station projects; and
- A discussion on the forecast capital expenditure profile and deliverability considerations.

The workshop was held under “Chatham House” rules, so no comments from attendees have been attributed to any one attendee. AusNet Services’ responses or comments have been noted in relation to matters raised by attendees.

1.3. Other related documents

This report should be read in conjunction with two key documents which are co-located on the same page of the AusNet Services’ website that contains this report. The documents will provide important information and context when reading this report and are listed as follows:

- Pre-reading materials developed by AusNet Services for the relevant workshop – this document contains background and other information provided to workshop attendees to prepare them for their workshop attendance; and
- Presentation materials developed by AusNet Services for the relevant workshop – this document contains the material presented at the workshop.



2. Key discussion items

This section contains the key items discussed at the workshop. AusNet Services' responses or perspectives provided either during or post the workshop are included where relevant and required in the shaded text boxes.

2.1. Deep dive one workshop recap

There was a brief recap of the key discussion points and outcomes from the first Deep Dive Workshop held on 30 June 2020. Stakeholders provided positive feedback on the content and discussion from the workshop and there were no major concerns or gaps with the key points raised.

There was a question of clarification on the applicability of the productivity growth forecast measure used in the operating expenditure forecasts.

AusNet Services noted that the current draft proposal uses a value of 0.14%, which is an industry average trend consistent with the approach used by the AER. It was also noted that this value will be updated based on new information prior to lodgement.

2.2. Overview of the capital expenditure program

The discussion on the forecast capital expenditure noted that there is an increase over the current period's actual/expected capital expenditure. This increase is reflective of higher expenditure to replace terminal stations and other assets based on their condition as well as higher technology related expenditure including cyber security investments to comply with anticipated regulatory changes.

The main comments and questions from attendees included:

- With each substation rebuild, is AusNet Services focusing on critical replacements or entire rebuilds?
- What are the implications, if any, of the recent Australia Energy Market Operator (AEMO) Integrated System Plan (ISP) on major station projects? Noting also that the two presented case studies are integral to the ISP.
- In relation to the Western Victoria transmission network upgrade, to what extent does AusNet Services assess upgrade timing and any inter-relationships and delay risks?
- Given the rapid rate of change in the energy sector and lengthy asset life (40+ years), how does AusNet Services incorporate potential changes to the system in its plans?

AusNet Services noted the discussion and commented that:

- Ausnet Services undertakes a rigorous assessment to determine the most suitable option for all substation rebuilds. Very few (if any) projects have a proposed full station replacement, most are either staged or specific component replacement, only.
- There is a specific joint briefing session with AEMO on 26 August 2020 to discuss the implications of the ISP and interdependencies with the revenue proposal.



- There are some interactions between committed projects and proposed projects such as the Western Victoria upgrade. In this example, AusNet Services is considering the interaction between future replacement projects for switchgear at Sydenham Terminal Station and how to efficiently deliver both projects.
- Consistent with the ISP priority project implementation rules, AusNet Services is encouraging AEMO to assess key projects at an earlier stage to assist with understanding interdependencies and delay risks.
- In relation to changes in the energy sector, AusNet Services leverages the information and consulting outputs available from AEMO when considering potential system changes, demand outlooks and impacts on proposed projects. In addition, the joint planning process requires AEMO to review AusNet Services' plan and project scopes.

2.3. Economic assessment framework

The discussion on the economic assessment framework highlighted that there is a structured and detailed assessment framework and process that is used to determine the preferred option and economic timing for each project.

The general discussion and questions from attendees covered the following areas:

- Stakeholders noted that the AER is focusing on valuing Distributed Energy Resources (DER). A question was raised if this is also considered in the AusNet Services analysis?
- It was noted that the Value of Customer Reliability (VCR) is an input and consideration in the analysis. Some questioned if the updated reliability standard is also a consideration or input into AusNet Services analysis?
- Detail was requested in relation to supply risk. In particular, some queried if it is big or small?
- Further questions were asked regarding delivery risk and how AusNet Services quantifies and captures this risk in the current framework?
- As the ISP is implemented, some queried if the system would become more integrated and therefore would reduce some of the risks?
- It was acknowledged that setting the baseline risk is critical. Some queried if further detail could be provided such as an 'assumptions book' to understand AusNet Services' assessment of the financial implications around other areas such as collateral, environment, safety, fatalities?
- There were also further detailed questions regarding the baseline risk:
 - Does it include reputational and equity risks?
 - What confidence does the business have in using the UK methodology to quantify risk?

AusNet Services noted the discussion, acknowledging the need for further information and analysis in relation to baseline risk and provided the following comments:

- DER is an implicit input, as it is a key assumption in the demand forecast and ISP scenarios prepared by AEMO. It also interacts with AusNet Services' regulatory investment test for non-network solutions, the interaction between distribution and transmission level investments and requirements is a key consideration.



- Whilst AusNet Services uses VCR to value supply risk, it does not explicitly use the reliability standard because the approach is to maintain reliability on a 'like for like' basis, not to improve reliability.
- Supply risk is generally small for transmission. The N-1 risk is designed so that one asset can fail, yet there is minimal impact on customers and the market. It is N-2 that causes high risk; however, the probability is lower. We consider all options for our projects and assesses N-1, N-2 and even N-3 failures even though the probability reduces.
- As the ISP is implemented, then some risks should reduce. However, the risks may also need to be reassessed as they are contingent on other developments in the Victorian market and transmission network.
- The business acknowledges there is detail involved in the risk assessment and further information can be provided including at a subsequent workshop.
- In relation to the detailed queries:
 - A significant volume of work has been undertaken since the last TRR to enhance the risk assessment however it does not include risks such as reputation and equity.
 - AusNet Services noted there is a lot of detail behind the risk assessment and further information could be provided at an upcoming meeting. The Business highlighted the extensive work completed since the previous TRR, specifically for inputs to quantify safety risk / loss of life. There are limited references available and risks regarding reputation and equity have not been factored in. UK data is from distribution networks for voltages up to 132kV. Although, it is not a voltage generally used in Victoria, it is classified as a transmission voltage. Data on fatalities caused by network asset failure is scarce and this reflects the deliberate intent of NSPs to avoid catastrophic failure and associated risk of death and injury, hence the limited data reflects prudent management of failure risk.
 - As a further validation on the reasonableness of the approach and inputs, there has been regulatory oversight to this process with collaboration between Energy Safe Victoria and distribution businesses.

2.4. Case studies: major station projects

The presentation on the major station projects covered two case studies: Red Cliffs Terminal Station (RCTS) and Keilor Terminal Station (KTS). The discussion covered the options considered, details on the results of the economic assessment, sensitivity analysis and the optimal timing. The discussion and key questions from attendees covered the following areas:

- There was an overarching comment from stakeholders regarding the need for meaningful discussion on non-network options.
- The interdependency with the ISP was raised, and some specific questions including:
 - What are the sensitivities to the ISP regarding AusNet Services' replacement projects? Some noted that it was difficult to isolate the ISP from AusNet Services' proposal.



- Is it reasonable to expect additional generation volume, as per the ISP, would put greater pressure on AusNet Services' assets, and therefore, require additional upgrades in the future? For example, the next 5-7 years is likely to have a significant increase in volume flowing through KTS and RCTS.
- A question was raised on whether there was any impact to RCTS given that project 'Energy Connect' would connect to this terminal station?
- Some queried the trade-off between lowest cost overall and the extent to which costs can be spread out? For example, Option 1 and Option 2 for KTS, how does their timing feed into the optimisation strategy?
- A question was raised, if AusNet Services replaces the 220/22kV transformers with 220/66kV, has this been discussed with the relevant distributor? If so, are these costs reflective of the combined transmission and distribution costs?
- There were further detailed queries in relation to the analysis and assumptions:
 - Are the numbers presented in Net Present Value (NPV) terms? If yes, what is the discount rate? Are the total capex numbers in NPV terms?
 - Does the fact that the costs in some options are deferred in NPV terms make up for the bigger dollar amount because AusNet Services would complete this in two parts? If the NPV is higher, why would the Business even consider lesser value Options?
 - How does AusNet Services assess the failure rate for a given station/component?
 - What is the driver for the failure rate sensitivity at KTS? Are N-1, N-2 and N-3 scenarios correlated?

AusNet Services noted the discussion and acknowledged the need for further consideration of some issues in the Revenue Proposal and provided the following comments:

- At the time of final decision for options implementation, an assessment process takes place to ensure lowest cost option including non-network solutions is chosen that results in reduced costs for customers.
- AusNet Services highlighted most non-network related opportunities tend to be associated with augmentation expenditure rather than replacement expenditure. AusNet Services is currently working on these types of projects, for example United Energy and AusNet Services are investigating demand management solutions and whether it can defer significant upgrades of the Cranbourne Terminal Station. This is considered in detail as part of the augmentation expenditure in the electricity distribution price review.
- An example on an intersection of needs is the proposed replacement of the SVC at Horsham Terminal Station for voltage control. AusNet Services had commenced the RIT-T process. However, AEMO declared a system strength gap. To address both issues, AusNet Services is now considering a Synchronous Condenser (SC), a solution for voltage control and system strength. In addition, generator connections in the area require SC to achieve generator performance standards so there may be an opportunity for a third party to provide services to cover the voltage control, system strength and generator performance requirements.



- In relation to the ISP, AusNet Services notes:
 - Some of these interdependencies will be discussed and considered in the joint AEMO / AusNet Services briefing on 26 August 2020.
 - AusNet Services is considering how many of these replacement projects interact with the ISP projects. There are some interactions that are evident such as, VNI and South Morang. However, notwithstanding the interactions noted, at this stage the business's view is that the identified replacement projects would still need to progress.
 - It is reasonable to assume additional volume is required due to the ISP, increasing pressure on certain assets. In addition to current projects, future proposals may be necessary to address additional volume.
- In relation to project Energy Connect, AusNet Services noted minimal impact to Red Cliffs replacement project given it is about the connection of the customers at the local level whilst project Energy Connect is an interconnector to enable transfer of energy between NEM jurisdictions. AusNet Services is preparing a RIT-T to meet the economic timing for RCTS. However, as part of this process, the Business will continue to consider all factors and the appropriateness of the project.
 - With respect to spreading of costs and optimization strategy, for many of the projects it is more economical to stage the project and complete it over a longer period even though the total cost is greater, provided there is no material risks with staging. Staging can also provide additional optionality for future market development; however this is not explicitly considered in the analysis.
- The replacement of the 220/22kV transformers with 220/66kV has been discussed with the relevant Distributor. AusNet Services is not converting any equipment, it is replacing two existing transformers with a transformer that has two windings. Therefore, it supplies 66kV and 22kV and some of the existing transformers are also capable of doing that – it should not affect the configuration for the Distributor.
- In relation to the detailed queries:
 - The options analysis is in NPV terms and it is using the base discount rate for the evaluation. The total capital cost values are not discounted.
 - The absolute cost is higher when the project is completed in two stages because there are costs associated with mobilising the site each time. In NPV terms however, it depends on project timing and the discount rate.
 - AusNet Services develops failure curves for the various asset types that are based on the condition score of the asset as assessed during an inspection, this information is fitted to the failure curve. Typically, asset failure risk increases over time.
 - In relation to the failure rate at KTS, this is a large station, therefore if the asset fails there is potentially a significant amount of load lost. Correspondingly, if the failure rate is lower then the risk is potentially much lower, and the range of outcomes is very sensitive to failure rates.



- As mentioned previously, the N-1 risk is designed so that one asset can fail, yet there is minimal impact on customers and the market. It is N-2 that causes high risk. We consider all options for our projects and assesses N-1, N-2 and even N-3 failures even though the probability reduces. However, analysis does not apply different failure curves for each of these risks, rather depending on the load at the terminal station and the asset conditions, the risks will vary. For example, if there are two transformers in a poor condition and one fails, the risk of failure is higher than if one transformer was in a poor condition and the second was in a good condition.

2.5. Capital expenditure profile

The presentation on the capital expenditure profile noted that there are potential deliverability considerations in determining the roll out and timing of the overall capital expenditure program and that some form of ‘smoothing’ may be required. Three indicative scenarios were presented and discussed to assist in highlighting the key considerations and trade-offs. The discussion and key questions from attendees covered the following areas:

- Stakeholders generally acknowledged that some smoothing may be required and the need to consider the trade-offs involved.
- Some comments were made in relation to the trade-offs and considerations including:
 - The connection versus switching option trade-offs are very perspective driven and highly dependent on what areas the projects will impact. It may be more a policy view, so it is difficult to assess who should bare risk and cost for network investment and any smoothing.
 - Analysing the distribution of “off supply” impacts are possibly more important than just the mean duration of “off supply”.
 - Some trade-offs have very location and customer specific impacts (for example individual businesses) that may also need to be considered, rather than general impacts.
 - As a large end-user, it is easier to respond to a high price signal than an unplanned outage that could trip lines and possibly cause damage. This may also need to be considered in assessing trade-offs between connection and switching options.
- Several questions on the indicative results, approach and assumptions were also raised:
 - What is the baseline risk used in this assessment to understand the quantum of change between options?
 - Are both the project and cost recovery smoothed? When will customers incur those costs?
 - Regarding smoothing projects, in terms of time per customer, how has this been factored in regions and specific outage times?
 - For deliverability risk, how did you arrive at the low, medium and high scenarios?
 - Does the analysis consider a combination of network wide and location specific risks?



- Is one risk (connection or switching) more likely to happen over the other when referencing the risk scores for these options?
- In relation to switching stations risk this appears to be around market benefits test and connection stations is around the value of lost load. When you complete a RIT-T analysis, would that clarify the best NPV?
- To what extent are supply and market risk discrete? Noting safety risk is not a variable that is compromised in any assessment.
- Is it also possible to categorise assets as primarily customer or generator related? This may be easier to assist in identifying and understanding the risks.

AusNet Services noted the discussion and acknowledged the need for further consideration of some issues in the analysis and Revenue Proposal and provided the following comments:

- When assessing the profile, it is important to include deliverability risk and factor this into any final assessment.
- AusNet Services will endeavour to meet with some customer representatives and consider the impact of smoothing the capital expenditure profile on individual businesses.
- In relation to the specific questions raised:
 - The baseline risk is very close to zero as supply interruptions are rare. The minutes off supply are designed to highlight the sense of magnitude of an event.
 - The project and cost recoveries are both smoothed, so the costs paid by customers aligns with the value realised in the project.
 - The outage times per customer are indicative only and an average across the 20 programs. AusNet Services can provide analysis that highlights the impacts to specific regions.
 - In relation to deliverability risk, this is a high level view of the risk associated with the three options. With a large number of projects completed over a specific time period, many of which are highly complex, there are greater resourcing, material and other requirements. These factors influence our assessment of deliverability risk.
 - Our analysis can and will consider a combination of network wide and location specific issues. These types of trade-offs are not mutually exclusive.
 - The assumed connection and switching station options has the same likelihood of the risk event occurring.
 - A RIT-T would help clarify the best NPV. The underlying economic timing and risk analysis takes into account the NPV and assist in identifying the best option. For projects with the same NPV we would select the least cost project. However, we note the issues raised in this workshop and will consider how these can be included in our analysis.
 - Market and supply risk are not necessarily discrete, rather for any one project there may be a stronger driver or higher risk consideration.
 - The categorisation of assets as consumer and generator can be helpful, however is broadly consistent with the classification of switching and connection.



A. Workshop attendees

Name	Organisation
Nick Eaton	Alcoa
David Monk	Australian Energy Regulator
James Brown	Australian Energy Regulator
Jane Kelly	Australian Energy Regulator
John Thompson	Australian Energy Regulator
Juris Kuznecovs	Australian Energy Regulator
Bridgette Carter	BlueScope Steel
Elizabeth Carlile	CitiPower & Powercor & United Energy
Bev Hughson	Consumer Challenge Panel
David Prins	Consumer Challenge Panel
Mark Henley	Consumer Challenge Panel
Raif Sarcich	Victorian Government (Department of Environment, Land, Water and Planning)
Andrew Richards	Energy Users Association of Australia
Rudi Strobel	Jemena
David Headberry	Major Energy Users
Gavin Dufty	St Vincent de Paul
Charlotte Eddy	AusNet Services
Danielle Erzetic-Graziani	AusNet Services
Danielle Johnstone	AusNet Services
Jacqueline Bridge	AusNet Services
John Dyer	AusNet Services
Robert Ball	AusNet Services
Stephanie Judd	AusNet Services
Tom Hallam	AusNet Services
Victoria Draudins	AusNet Services
Peter Eben	Seed Advisory



B. Workshop Agenda



2023-27 Transmission Revenue Reset - Deep Dive #2

Objective

Deep Dive #2 will focus on key elements of our proposed network capital expenditure (capex) forecast.

The objectives of the session are to:

- **Inform stakeholders** regarding the assessment framework used to determine economic timing for our proposed major station projects;
- **Seek stakeholder views** on:
 - Two major station projects included in our forecast, which are presented as case studies; and
 - Our network capex profile and options for managing deliverability risk.

Agenda

MEETING DETAILS	
Workshop:	AusNet Services Deep Dive #2
Date:	Tuesday 11 August
Time:	1:00-4:00pm
Location:	Microsoft Teams meeting
Security:	Public
Pre-Reading:	Attached
Facilitator:	Peter Eben, Seed Advisory
AusNet Services Presenters:	Rob Ball, Principal Economist John Dyer, Manager, Asset Management Strategy Jacqui Bridge, Transmission Development Manager

TIMING	ITEM	PRESENTER
1:00 (10 min)	Welcome and introductions	Peter Eben
1:10 (5 mins)	Deep Dive 1 outcomes	Rob Ball
1:15 (10 mins)	Open discussion on Deep Dive 1 outcomes	All
1:25 (5 mins)	Overview of the capex forecast and proposed major station projects	Rob Ball
1:30 (10 mins)	Initial feedback on the overall capex forecast	All
1:40 (10 mins)	Overview of economic assessment framework for major station projects	Jacqui Bridge
1:50 (20 mins)	Questions of clarification regarding the economic assessment framework	All



2:10 (10 mins)	Break	
2:20 (10 mins)	Case studies: Red Cliffs Terminal Station (RCTS) and Keilor Terminal Station (KTS) major station projects	John Dyer
2:30 (35 mins)	Open discussion on RCTS and KTS major station projects	All
3:05 (5 mins)	Break	
3:10 (10 mins)	Capex profile and deliverability considerations	John Dyer / Rob Ball
3:20 (30 mins)	Open discussion on capex profile and deliverability considerations	All
3:50 (10 mins)	Next steps and forward engagement plan	Peter Eben / Rob Ball
4:00 pm	Meeting close	

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