MURRAYLINK: TRANSMISSION DETERMINATION - REVISED PROPOSAL

Murraylink Transmission Co Pty Ltd 580 George Street, Sydney

Executive Summary

We are proud to provide this transmission determination revised proposal for the period 1 July 2023 to 30 June 2028.

Consistent with the concerns that we have received from stakeholders that cost management is important, we are forecasting a reduction in overall expenditure across the next determination period. The revenue forecast outlined in this proposal reflects the cost management that we have exercised across the period, resulting in lower forecast capital expenditure and operating expenditure compared to the current transmission determination period.

Stakeholder Engagement

This proposal and the supporting materials incorporates input and feedback received during stakeholder engagement we undertook.

We have undertaken extensive stakeholder engagement prior to the revised proposal. Our stakeholder engagement programme commenced on 30 August 2021. Stakeholder engagement involved seven workshops.

Our engagement program covered:

- Stakeholder engagement
- Obsolete IGBTs
- Forecast capital expenditure
- Forecast operating expenditure
- A copy of proposal overview
- Insurance
- Commercial Services Fee
- Revenue split between SA and Victoria

Attendees at the workshops represented small residential customers, large customers, rural customers and Government and Industry representatives.

Obsolete IGBTs

A key challenge that we worked together with stakeholders on is the response to the obsolescence of generation 2 insulated Gate Bi-polar Transistors (IGBTs). Together with stakeholders we have used the analysis provided by Oakley Greenwood and Amplitude to identify the preferred solution. The preferred solution is to replace the current generation 2 IGBTs with generation 3 IGBTs in a single phase at one of the converter stations.

The timing of the replacement project is determined by the future failure rate of existing IGBTs - this is uncertain. However, the anticipated cost of the preferred solution at $20.5 million is less than the $30 million minimum threshold for a contingent project under the National Electricity Rules so this option is not available to us.

As discussed with Stakeholders, this proposal does not include a forecast for the replacement of Obsolete IGBTs. Instead we are proposing that should this expenditure become necessary

between financial year 2024 and 2028 that it will be, subject to AER review, included in the Regulatory Asset Base at the start of the subsequent revenue reset period. In addition, if the replacement of Obsolete IGBTs is necessary it is not appropriate to treat this expenditure as if it was a cost overrun or inefficiency, so the project expenditure should be excluded from the incentive schemes.

Summary of Revised Proposal

We are proposing a total revenue for the financial year 2024 to 2028 period of $81.2m

We have limited the changes since the draft determination. The matters contained in this revised proposal, that we discussed with or informed our stakeholders of, are:

- Insurance premiums
- Security of critical infrastructure capital expenditure and operating expenditure

The revised revenue proposal is proposing forecast revenue that is only 0.7% above that which the AER determined in its draft determination.

We welcome any feedback stakeholders have in response to this revised proposal. Submissions can be sent to Murraylink2024@apa.com.au

Tables

Attachments

Attachment 1: Oakley Greenwood Report

Attachment 2: Amplitude Report

Attachment 3: Business case (SOCI)

Attachment 4: Marsh Insurance Forecast

Attachment 5: PTRM

Attachment 6: RFM

Attachment 7: Operating expenditure model

Attachment 8: Capital expenditure model

Attachment 9: Claims for confidential information

Attachment 10: AEMO Letter

Attachment 11: EBSS

Attachment 12: CESS

1. Key Outcomes

This section sets out the key elements of the Murraylink Revised Proposal.

The revenue proposal for Murraylink proposes a revenue for the first year of the transmission determination period of $16.1m which is a reduction of revenue of $1.1m compared to the current financial year.

This reduction reflects an emphasis on cost control within Energy Infrastructure Investments (EII) and APA and a reduction in the rate of return as determined under the AER's rate of return instrument.

1.1. Revenue

The revised proposal contains a smoothed revenue forecast for the transmission determination period as set out in Table 1.

Table 1: Forecast Revenue

Forecast Revenue ($m Real FY23)	2023-24	2024-25	2025-26	2026-27	2027-28	Total
Revenue	16.1	16.1	16.1	16.1	16.1	**80.6**

This represents a decrease of 0.9% compared to the current transmission determination period. The revenue from both periods is set out below.

The revenue is calculated using the AER's Post Tax Revenue Model (PTRM) in attachment 14.

Table 2: Forecast and current period allowed revenue

Revenue comparison ($m Real FY23)	Revenue
Current	81.6
Forecast	80.6
Difference	-1.0

1.1.1. X Factors

We accepted the AER's draft determination with regards to X factors. The AER have made, and Murraylink supports, the price path flat in real terms for years 2-5, or more technically making the X factors 0 for the reset period.

This is consistent with feedback stakeholders have provided to APA on other network consultations.

1.1.2. Building Block Revenue

The building block revenue for the revised proposal and the draft determination are set out below.

Table 3: Forecast Period Building Block Revenue

Building Block Revised Proposal ($m Real FY23)	2023-24	2024-25	2025-26	2026-27	2027-28	Total
Return on Capital	7.2	7.2	7.1	6.9	6.6	**35.0**
Regulatory Depreciation	2.6	3.2	4.4	5.2	5.7	**21.0**
Operating Expenditure	5.0	5.0	5.0	5.0	5.0	**25.1**
Revenue Adjustments	-0.6	-0.1	0.0	0.1	-0.8	**-1.4**
Net Tax Allowance	0.2	0.2	0.1	0.2	0.4	**1.2**
Total	**14.4**	**15.4**	**16.7**	**17.4**	**16.9**	**80.8**

The building block revenue for the current period is set out below.

Table 4: Draft Determination Building Block Revenue

Building Block Revenue Draft Determination ($m Real FY23)	2023-24	2024-25	2025-26	2026-27	2027-28	Total
Return on Capital	7.1	7.1	7.0	6.8	6.5	34.4
Regulatory Depreciation	3.2	3.7	4.9	5.3	5.6	22.7
Operating Expenditure	4.6	4.6	4.6	4.6	4.5	22.8
Revenue Adjustments	-0.6	-0.1	0.0	0.1	-0.8	-1.4
Net Tax Allowance	0.3	0.3	0.2	0.3	0.5	1.6
Total	14.5	15.4	16.7	17.1	16.3	80.1

The major differences are in regulatory depreciation (down $1.7m) and operating expenditure (up $2.3m). The building blocks are discussed in more detail below.

1.2. Return on capital

The dollar value of the return on capital is calculated by multiplying the regulatory asset base by the rate of return.

The rate of return is calculated using the AER's rate of return instrument. We have also used the value of imputation credits set by the AER. We accept the AER's draft determination with regard to the averaging period.

The draft determination's value and the revised proposal value are set out in the table below.

Table 5: Rate of return

Rate of return	Draft Determination	Revised Proposal	Difference
Return on Capital	5.6%	5.7%	0.1%

The rate of return multiplied by the regulatory asset base. There is a minor increase in the forecast asset base in the revised proposal compared to the draft determination. This reflects

changes in depreciation, indexation and a minor change in forecast capital expenditure for physical security. The revised proposal compared to the draft determination is set out below.

Table 6: Forecast Opening Regulatory Asset Base

Forecast Opening Asset Base ($m Real FY23)	2023-24	2024-25	2025-26	2026-27	2027-28
Revised Proposal	128.1	125.1	120.1	112.7	104.1
Draft Determination	128.1	125.0	119.0	110.9	102.9
Difference	-0.0	0.1	1.2	1.8	1.2

The declining asset base is being driven by the declining level of new capex associated with the asset.

This results in an increase in forecast return on asset as compared to the draft determination as set out in the table below.

Table 7: Return on Capital

Forecast Return ($m nominal)	2023-24	2024-25	2025-26	2026-27	2027-28	Total
Revised Proposal	7.4	7.7	7.9	7.9	7.8	**38.7**
Draft Determination	7.3	7.5	7.7	7.7	7.5	**37.6**
Difference	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**1.1**

1.3. Forecast Capex

The forecast capital expenditure program is discussed in more detail in Chapter 3. The total for forecast capital expenditure is set out in section 3.4.

Table 8: Forecast Capital Expenditure

The forecast capital expenditure is higher in the revised proposal than in the draft determination. This is due to more detailed information being available for inclusion in the forecast for physical security work necessary to meet the SOCI obligations. Further details on this project are set out in section 3.

Table 9: Revised Proposal and Draft Determination Forecast Capital Expenditure

Forecast Capital Expenditure ($m Real FY23)	2023-24	2024-25	2025-26	2026-27	2027-28	Total
Revised Proposal	4.3	4.5	3.7	1.8	0.8	**15.0**
Draft Determination	4.3	4.3	2.5	0.7	0.8	**12.6**
Difference	**0.0**	**0.1**	**1.2**	**1.1**	**0.0**	**2.5**

The forecast capital expenditure is substantially below the capital expenditure proposed, and being incurred, in the current regulatory period. The comparison is set out in the table below.

Table 10: Forecast Capex vs Current Period Allowance

Forecast Capital Expenditure ($m Real FY23)	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Forecast Capital Expenditure	4.3	4.5	3.7	1.8	0.8	15.0
Current Period Allowance	11.0	7.1	5.9	2.5	3.6	30.1
Difference	-6.7	-2.7	-2.2	-0.7	-2.8	-15.1

1.4. Historic Capex

We accept the AER's draft determination as it relates to historic capital expenditure. This is reflected in Table 11 below.

Table 11: Capital expenditure in current transmission determination period

($m nominal)	2018/19	2019/20	2020/21	2021/22	2022/23	Total
AER Draft Determination	10.3	6.8	5.7	2.5	3.6	10.3

1.5. Opening Regulatory Asset Base

We accept the AER's draft determination of the opening asset base. We have attached the Roll Forward Model in attachment 6.

1.6. Future Asset Classes

We are not proposing any changes to future asset classes from the AER's draft determination.

1.7. Forecast taxation

The tax allowance is calculated in the AER's Post Tax Revenue Model. The AER has modified the way in which the tax allowance is calculated. This revised calculation reduces the forecast taxation by $1.2m.

The total of these calculations is set out below:

Table 12: Tax

Tax ($m nominal)	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Revised Proposal	0.2	0.2	0.1	0.2	0.4	**1.2**
Draft Determination	0.3	0.5	0.5	0.5	0.6	**2.4**
Total	**-0.1**	**-0.3**	**-0.4**	**-0.3**	**-0.2**	**-1.2**

1.8. Forecast operating expenditure

Murraylink has based its forecast operating expenditure on the operating expenditure incurred in financial year 2021. Financial year 2021 was selected as it was the most recent year and represented the best basis for the forecast.

We have proposed changes to the forecast operating expenditure for SOCI cyber costs and insurance premiums.

Table 13: Forecast Operating expenditure

Forecast Opex ($m Real FY23)	2023-24	2024-25	2025-26	2026-27	2027-28	Total
Revised Proposal	5.0	5.0	5.0	5.0	5.0	25.1
Draft Determination	4.6	4.6	4.6	4.6	4.5	22.8
Difference	0.4	0.4	0.5	0.5	0.5	2.3

1.9. Incentive arrangements

We have accepted the AER's draft determination for CESS and EBSS.

1.10. Obsolete IGBTs

On December 13, 2021 Murraylink was advised by Hitachi that there are only 115 Gen 2 IGBTs left available to buy. This means that at some time, possibly in the revenue reset period, Murraylink will run out of IGBTs. In order to remain in operation Murraylink will have to find a solution to this problem.

Obsolete IGBTs are discussed in more detail in section 4.

2. Stakeholder Engagement

Murraylink is proud of its stakeholder engagement and grateful to those that have given their time, knowledge and efforts to the process.

The objective of our stakeholder engagement as stated in our engagement plan is:

"We want to understand our stakeholders' priorities and reflect these in our transmission determination proposal"

2.1. Key conclusions from Engagement

There were a number of key takeaways from the stakeholder engagement that Murraylink undertook. These are set out in more detail below.

2.1.1. Importance of stakeholder engagement

A theme that strongly came through our stakeholder engagement was the support that our stakeholders had for the open and transparent engagement process that Murraylink was seeking to implement.

2.1.2. Support for consideration of IGBT purchases

At the original stakeholder engagement on forecast capital expenditure projects there was broad support for the approach that Murraylink was taking to consideration of the potential obsolescence of Generation 2 IGBTs used in the Murraylink converter stations. However, this was overtaken by notification from Hitachi of the limited number of available spares discussed further in section 4.

2.1.3. Support for the analysis that Murraylink was undertaking to identify the solution to the obsolete IGBT problem

There was support amongst stakeholders for the analysis that Murraylink was undertaking to identify the correct solution to the obsolete IGBTs issue.

2.1.4. Consideration of pricing options

There was no support for undertaking a review of the current approach to allocating revenue recovery between ElectraNet and AusNet Services.

2.1.5. Importance of understanding of Murraylink's value to the NEM

Stakeholders were interested in understanding the value of Murraylink to the NEM. AEMO was very helpful and wrote how they use Murraylink and how they see its role going forward. See attachment 10.

Murraylink has also engaged HoustonKemp to attempt to put a numerical value to the benefits that Murraylink provides to NEM customers. This material will be circulated to stakeholders when it is available.

2.2. Process

Murraylink's stakeholder engagement to date had five stages. The Stakeholder Engagement Plan is attachment 18 of the original proposal.

2.2.1. Co-design Workshop

This workshop was held on 30 August and focused on developing a stakeholder engagement process that met the needs of both the stakeholders and Murraylink.

This session successfully identified the format and topics for future engagement by Murraylink prior to the submission of our transmission determination proposal.

There was strong support from Stakeholders for an engagement that is proportionate to the significance of the asset to the National Electricity Market and consumers.

2.2.2. Workshop 1

Workshop 1 focused on the nature of Murraylink and its role in the NEM, in particular how this would be expected to affect the nature and contents of our transmission determination proposal.

2.2.3. Workshop 2

Workshop 2 was focused on the building block elements of the transmission determination proposal and specific consultation on the proposal with respect to IGBTs and potential alternative approaches to the division of revenue recovery between Victoria and South Australia.

2.2.4. Circulation of draft proposal

A draft copy of this proposal was circulated to the stakeholder engagement group. We received feedback from the Australian Energy Regulator which has been incorporated into this revised proposal.

2.2.5. Workshop 3

Workshop 3 was focused on the notification from Hitachi that there were only 115 IGBTs available to Murraylink. The workshop focused on next steps and material for inclusion in the proposal. Stakeholders were clear that they desired a clear engagement process to discuss solutions to the IGBT issue on Murraylink.

2.2.6. Economic Consulting RFP

Murraylink produced a draft Request for Proposal relating to the economic modelling to support analysis of the different options for the replacement of obsolete IGBTs.

Feedback from stakeholders led to transparency of method being added to the list of criteria against which proposals were being assessed.

2.2.7. "AER public forum" presentation

This presentation focused on the approach that Murraylink was proposing to take resolving the obsolete IGBT issue raised late in the process by Hitachi.

This document was prepared for the AER public forum which was cancelled due to lack of interest from stakeholders.

The document outlined the timeline and process for engaging consultants to support the analysis for resolving the obsolete IGBT issue.

2.2.8. Revised Proposal Workshop 1

The presentation identified the changes Murraylink was contemplating for the revised proposal. These included a forecast for insurance premium rises, additional SOCI expenditure identified and the results of Oakley Greenwood's analysis of the options.

Murraylink noted the difficulty of consulting with or informing stakeholders around SOCI given restrictions on the information that can be provided for asset security reasons.

Stakeholders expressed interest in Murraylink exploring alternative means of managing insurance premiums, like some other networks.

Insurance is covered in more detail in section 5.1.

2.2.9. Revised Proposal Workshop 2

In revised proposal workshop 2 APA provided additional material in relation to insurance arrangements in response to the questions raised in the previous stakeholder session. This is discussed further in section 5.1.

We also informed stakeholders of changes in the EII portfolio resulting in additional allocation of commercial services fees to Murraylink in the next revenue reset period. However, this was not progressed to the revised proposal.

We also discussed further the obsolete IGBTs project. That discussion identified that it was not possible to apply for a contingent project for the replacement of the obsolete IGBTs. The discussion then moved to alternative approaches to resolving the obsolete IGBTs.

2.3. AER stakeholder engagement expectations

Nature of engagement	
AER expectation	**Murraylink Action**
Sincerity of engagement	
Genuine commitment from network businesses extending down from their Boards and Executives to giving effect to consumer preferences.	We report to the EII Board and APA Management about progress with stakeholder engagement and the concerns that are raised with us by stakeholders.

Openness to new ideas and a willingness to change.	We engaged with stakeholders to identify topics of concern and adjusted work we were undertaking. Examples are in relation to the RFP for economic analysis and sought further exploration of insurance issues to provide feedback to stakeholders.
Ongoing engagement with consumers about outcomes that matter to them, which allows consumers to 'set the agenda'.	We returned to stakeholders with feedback on the concerns they have raised. Examples include the work Murraylink is seeking on the net value of Murraylink and the IGBT analysis and insurance arrangements.
Ensuring consumer confidence in the engagement process and alleviating concerns consumers may have.	Stakeholders have praised the approach Murraylink has taken to the transparency of its engagement approach. Murraylink will seek further feedback from stakeholders on the engagement process when it is complete.
Equipping consumers/ maintains the independence and integrity of consumer engagement process	
Consumer representatives should clearly declare any interests that may be perceived to conflict with those of the consumers they're representing and provide details on how they're managing any conflicts of interest	One consumer representative withdrew from the engagement on the basis of a perceived conflict of interest with their involvement on the VTS consumer challenge panel.
Networks and consumer representatives should transparently set out all governance arrangements covering their interactions in the development of a regulatory proposal, including arrangements in place to ensure the independence of consumer representatives	Not applicable. Consumer representatives were employed by consumer advocate organisations.
Networks should publicly declare all remuneration arrangements, benefits and financial support provided to consumer representatives.	Not applicable in our case. Consumer representatives were employed by consumer advocate organisations.
Accountability. Transparent reporting and consultation on the delivery of commitments will improve relationships and understanding between networks and consumers and increase faith in regulatory processes. It will also allow for ex-post evaluation of consumer engagement, regulatory proposals and our determinations.	We do not have a formal structure for feedback on the delivery of commitments.
Breadth and Depth	
Accessible, clear and transparent	
Expect network businesses to transparently set out their engagement plans including outlining objectives, engagement issues/topics and the level of participation and influence consumers can expect on the regulatory proposal.	For Murraylink we produced an engagement plan reflecting a co-design approach to the engagement strategy. The engagement plan set out our objectives, principles, and indicative timetable. The purpose of engagement

	was to receive insights and input from the community of customers, consumers and stakeholders in developing the proposals.
Consultation on desired outcomes and then inputs	
Consumers should guide, and be seen to guide, the development of proposals. This means that consumers should be consulted on the outcomes that they want from the proposal and how they would like network businesses to engage with them in the development of a proposal to give effect to those outcomes. This may then guide later consultation on the individual components of a proposal. AER commits to giving effect to customers' desired outcomes to the extent that we are able to under our regulatory framework. Consultation on a regulatory proposal should not end with the submission of that proposal. If circumstances change and it is necessary to update a proposal, we expect networks to engage with consumers on those changes.	Murraylink consulted on the approach to engagement that stakeholders would like to see. We were open to topics that stakeholders wished to discuss but, as also experienced by the AER, while there was some feedback from stakeholders on individual topics mostly stakeholders left the Agenda setting to Murraylink. Noting no concerns were raised with Murraylink on this approach. Engagement continued through the revenue determination process with the last workshop being in late November. A copy of the outcomes of the revised proposal were circulated to stakeholders.
Multiple channels of engagement	
AER recognises that no single avenue of engagement is perfect. Consumer panels, surveys, forums, direct meetings. To gain a comprehensive understanding of consumer preferences multiple complementary channels are necessary. Some channels mentioned are workshops, focus groups and 'deep dives' which are suited to certain types of issues and have their downsides. AER expects networks to directly engage with their consumers as well as engaging with consumer representatives. A network business should aim to understand, represent and balance the interests of all its consumer cohorts. Where network businesses identify competing interests, they should seek to develop agreed positions with consumers. If this isn't possible, then network businesses should set out the competing interests in relation to elements of their proposals.	Murraylink's approach has been to engage with a broad range of stakeholders - rather than 'consumers' directly. The broad stakeholder engagement group has worked well and received good feedback from participants. APA's approach of a broad group allows different stakeholders to hear concerns of different groups. Feedback we received from stakeholders was our engagement should be proportionate with the nature of the Murraylink asset and its revenue requirements. We sought to engage with consumer advocates instead. St Vincent de Paul, Brotherhood of St Laurence, Council of the Ageing. Note that we sought engagement from Energy Consumers Australia who were, unfortunately, not able to participate due to other priorities. We have undertaken workshops consistent with the feedback that we received from our stakeholders. We offered to have one-on-one meetings with stakeholders. All the engagement material was available on the APA website.

Consumers' influence on the proposal	
Engagement should consider the IAP2 Spectrum of Public Participation, in particular the different levels of participation and range of influence (ranging from inform to empower) consumers have on the regulatory proposal. We consider that network businesses and consumers should consult with each other on the range of issues consumers can have influence over. Issues over which consumers will have more influence should be at the upper (empower) end of the IAP2 spectrum. Network businesses should encourage consumers to test assumptions and processes that underpin the proposal. Where consumers aren't well equipped to do so, this may entail providing them with additional resources and supporting them to commission independent analysis.	For Murraylink, one of the engagement principles was to 'provide for influence'. We made clear that: • We aim to be open about what is and what isn't open to stakeholder influence. We will let you know about these in advance. For example, our operating and capital expenditure plans are open to influence, however, rates of return have essentially been predetermined and will be presented for information only. We made the experts' IGBT analysis available to stakeholders to enable them to understand the nature of the analysis and its limitations rather than provide them with independent analysis. All analysis provided to Murraylink was also provided to stakeholders. We identified the response to IGBT obsolescence as an area for collaboration with stakeholders. The broader forecast capital expenditure was in the consult range. Noting that the commercial service fee forecast was on the inform spectrum.
Clearly evidenced impact	
Proposals linked to consumer preferences	
Clear link between consumer research and engagement, a network business's representation of the outcomes desired by consumers, and how the proposal gives effect to those outcomes. Networks need to provide evidence of consumer preferences – for example through independent surveys, research or focus groups. Where consumer views on an issue are diverse, network businesses need to set out those views and how they were balanced in developing their regulatory proposal. Network businesses should seek to find mutually acceptable solutions where there are divergent consumer views. To allow an opportunity for all stakeholders to comment, a network business should release a comprehensive draft regulatory proposal for stakeholder comment. The regulatory proposal submitted to the AER should set out how it has responded to the submissions received on the draft regulatory proposal. In testing customer perspectives on a draft regulatory proposal, we expect networks to engage with consumers beyond those they consulted with in preparing their draft proposal.	As noted above we engaged with the Stakeholder Engagement Group to maintain a level of stakeholder engagement consistent with the size of Murraylink. Murraylink continues to design proposals and revised proposals to minimise the cost of the network to consumers consistent with stakeholder feedback. Murraylink circulated a comprehensive version of its draft proposal to stakeholders for comment.

Independent consumer support for the proposal	
We want consumers to express support for proposals developed by network businesses. This support may be demonstrated through submissions on a draft regulatory proposal or an independent report setting out consumer perspectives on a proposal as lodged to the AER. An independent report is mandatory if a network business is seeking the early signal pathway (see section 2). The purpose of the report is to help us assess the quality of the engagement process and the extent to which a proposal reflects consumer preferences and desired outcomes.	Stakeholders supported the approach Murraylink was proposing to take on the Obsolete IGBTs. No material concerns were reported in relation to our proposal.

3. Forecast Capital Expenditure

We identified an incremental project required by Murraylink that has become necessary since we put in our original proposal: physical security related obligations.

This unfortunately means we are unable to accept the AER's draft determination as we would be unable to manage our capital expenditure program within the allowance the AER has set.

This means there are two changes to the revised proposal forecast capital compared to the AER's draft determination: updated inflation forecast and physical security.

3.1. Updated inflation forecast

We have updated the inflation assumptions in the capital expenditure model for updates in actual inflation, and the RBA inflation forecasts in the statement of monetary policy. This is consistent with the AER's approach to the calculation of inflation.

3.2. SOCI

The proposal forecast of capital expenditure was based on the best available information at the time of the preparation of the forecast. The revised proposal is based on updated information unavailable to Murraylink at the time of the proposal.

The energy sector is particularly susceptible to security threats. These threats are increasing as demonstrated by recent events worldwide.

The Australian Government has proposed legislative measures to protect Critical Infrastructure. The existing Security of Critical Infrastructure Act 2018 (the Act) will be superceded by the Security Legislation Amendment (Critical Infrastructure) Bill (SoCI Amendment Bill) 2020, proposed to pass in two separate Bills to address urgent elements of the reform as soon as possible. These Bills include:

- **Security Legislation Amendment (Critical Infrastructure) Bill 2021**: passed on 22 November 2021 subject to Royal Assent. The reforms are expected to be passed in their entirety by mid-2022.
- **The Security of Critical Infrastructure Amendment Bill (SoCI 2020)**: it introduces an enhanced framework, significantly expanding the scope of the existing legislation and governance rules requiring formally defined responsibilities and activities that support good risk practice and a greater awareness of threats and vulnerabilities to critical infrastructure assets.

The SoCI 2020 bill increases the obligations and requirements APA must comply with.

APA engaged EY to conduct a gap analysis of APA's capabilities to meet the SOCI obligations. EY found that the scope of obligations under SoCI 2020 is greater than the existing legislative

mandate and that Murraylink requires a range of capabilities to meet new compliance requirements in the following domains:

- Physical security;
- Cyber security; and
- Supply chain.

A site specific investigation has been undertaken on the basis of these higher standards and has identified additional work that is required. The cost to meet such compliance in relation to Murraylink is forecast to be an additional $2.2m over the five-year period.

A business case outlining the basis for the incremental expenditure is set out in Attachment 3.

3.3. Forecast Capital Expenditure by Program

The table below sets out the forecast capital expenditure by program.

Table 14: Forecast capex by program

Program	2023/24	2024/25	2025/26	2026/27	2027/28	Total
Cable Protection/Modification	0.3	0.3	1.4	0.3	0.3	**2.4**
Essential Spares	0.2	0.2	0.2	0.2	0.2	**1.2**
IGBTs	-	-	-	-	-	**-**
Stay in business	1.1	1.1	0.9	0.2	0.2	**3.5**
Reliability	0.5	1.2	-	-	-	**1.8**
SOCI	0.5	-	1.1	1.1	-	**2.6**
Enhanced Cooling	1.6	1.6	-	-	-	**3.3**
Regulatory Reset	0.0	-	-	-	0.2	**0.2**
Total	**4.3**	**4.5**	**3.7**	**1.8**	**0.8**	**15.0**

3.4. Forecast Capital Expenditure by Asset Class

The table below sets out the forecast capital expenditure by asset class.

Table 15: Forecast capex by asset class

Forecast Capital Expenditure by Asset Class ($m Real FY23)	2023 -24	2024 -25	2025 -26	2026 -27	2027 -28	Total
Switchyard	0.2	0.2	0.2	0.2	0.2	**1.2**
Transmission Cable	0.2	0.2	1.4	0.2	0.2	**2.4**
Easements	-	-	-	-	-	**-**
Control Systems	-	-	-	-	-	**-**
Ancillary asset- 30 Years	-	-	-	-	-	**-**
Ancillary asset - 7 Years	-	-	-	-	-	**-**
Other operating assets	3.3	3.9	0.9	0.2	0.2	**8.4**
Non ancillary asset	0.5	-	1.1	1.1	0.2	**2.8**
Buildings - capital works	-	-	-	-	-	**-**
In-house software	-	-	-	-	-	**-**
Total	**4.2**	**4.4**	**3.6**	**1.8**	**0.8**	**14.8**

4. Obsolete IGBTs

On 13 December 2021 Hitachi wrote to Murraylink informing us:

> *Currently the number of Gen2 IGBTs installed is about 21000, out of which 5832 are in Murraylink.*
>
> *Hitachi Energy has approximately 400 units of Gen2 IGBTs in stock, which are intended to be distributed among the installed base as equally as possible based on the share of the total installed units. This would mean that about 115 of these Gen2 IGBTs in stock could be available for APA.*
>
> *Based on the current global failure rate, the current Gen2 IGBTs stock might exhaust in upcoming 4-5 years.*

Murraylink has approximately 30 IGBTs in stock making for a total of 145 IGBTs available to keep Murraylink operating in its current configurations.

There are two broad options available to Murraylink consistent with the requirements of the National Electricity Rules. These options are:

1. Upgrade Generation 2 IGBTs with Generation 3 IGBTs and necessary incidental work; or
2. Replace Hitachi IGBTs and control and protection system through competitive procurement

There are also different replacement schedules that can be adopted. Hitachi IGBTs can be upgraded by phase. There are economies of scale and reduced outages that are produced by upgrading an entire converter station.

Hitachi IGBTs can be replaced in one or both converter stations. Again there are economies of scale that are realised by upgrading both converter stations together. This option also releases significant generation 2 IGBTs for resale.

4.1. Analysis undertaken

4.1.1. Amplitude Report

Murraylink engaged Amplitude to undertake a report ("Amplitude Report") into the potential for, and cost of, using a technology other than Hitachi's to provide for conversion to HVDC.

The Amplitude report found that this upgrade was possible and would not require major changes to physical infrastructure.

They also provided a cost estimate for this work of $42m for one converter station and $84m for both converter stations. The Amplitude report is attachment 2 to this revised proposal.

4.1.2. Oakley Greenwood Modelling

APA engaged Oakley Greenwood to analyse the short and long term options to determine the optimal economic approach to resolving the IGBT obsolescence issue.

A summary of our modelling approach is as follows:

- Oakley Greenwood engaged Partner, Endgame Economics, to undertake a "with" and "without" Murrarylink wholesale market model run using PLEXOS, with the difference in aggregated regional half hourly dispatch cost outcomes under each run transferred to an NPV (Excel) model;
- That NPV Model randomly combines one of 15 potential failure curves for IGBTs with one of three potential CAPEX solutions to create a "scenario", of which 40 (scenarios) are run at any given time in the model (with the model being run multiple times to generate the results that are presented in this report);
- For each scenario in the model, Oakley Greenwood have:
    - A starting stock of spares (which is the same across all scenarios - ~145 – based on Oakley Greenwood analysis of information provided by APA)
    - A forecast stock of spares for each year of the model, which is driven by:
        - the starting stock of spares (above),
        - *less* the number of assumed IGBT failures in that year (which depends on the randomly selected failure curve assigned to that scenario), and
        - *plus* the additional stock of spares that are created *if* a CAPEX solution is assumed to be built under that scenario.
- CAPEX solutions are automatically activated in the model in the year after the stock of spares reduces below 50.
- Different CAPEX solutions:
    - Create different amounts of spares;
    - Impose a different capital cost against that scenario; and
    - Impose a different outage cost against that scenario.

This report is contained in attachment 1.

4.1.3. Value of Murraylink to the NEM

AEMO has written a letter that outlines how it uses Murraylink to maximise benefit to consumers. This indicates that Murraylink is used during periods of high market divergence and as a means of maximising flows into and out of South Australia across Heywood. This is contained in attachment 10.

Murraylink has also engaged HosutonKemp to produce a report on the value of Murraylink to the NEM. This work is progressing and will be provided to stakeholders when it is available.

The analysis in this report will be looking at market dispatch and the "insurance" value provided by Murraylink.

4.2. Key Considerations for proposal

4.2.1. Preferred solution

Attached is a report from Oakley Greenwood that was presented to the Stakeholder Engagement Group (Attachment 1). It is not expected that a model will ever "give" the correct answer, modelling is helpful in that it can identify the relevant drivers of risk. In this respect the following conclusions can be taken from the work undertaken by Oakley Greenwood.

1. The reduction in losses from changing to an alternate technology doesn't significantly impact Murraylink's market benefits.
2. The key thing that switching to a different technology does is that it frees a significant number of IGBTs for resale. The value of which will only be revealed through negotiations with potential buyers. However, the price that would need to be achieved per IGBT is similar to what Murraylink has been paying for new IGBTs and the quantities are considerably higher than what Murraylink, and presumably any potential buyer, has bought in the past.
3. There are two drivers that determine the replacement schedule to replace Gen 2 IGBT with Gen 3 IGBT:
    a. the failure rate of existing IGBTs; and
    b. the recovery rate of Gen 2 IGBTs when a phase is upgraded.
4. The modelling shows that a substantial increase in failure rates is necessary before it makes converting an entire converter station as the first step the most efficient option in NPV terms.
5. The modelling shows that a low recovery rate is required prior to the economies of scale from upgrading a converter station becomes the preferred option.

The conclusion that modelling has enabled APA and stakeholders to reach is that, while there are risks, the most likely efficient solution to the long term replacement is the replacement of a single phase of Generation 2 IGBTs with Generation 3 IGBTs.

4.2.2. Timing

Stakeholders agreed with Murraylink that the timing of the replacement of the Generation 2 IGBTs is a subjective risk assessment. The risk is the fewer Generation 2 IGBT spares that are available when the process for replacement commences the more likely it is that Murraylink will run out of IGBTs, and have an unplanned outage, before the replacement is complete.

If Murraylink upgrades the Generation 2 to Generation 3 IGBTs in a planned manner this means that Murraylink will be offline for an anticipated 70 days. Importantly this outage can be co-ordinated with AEMO and other networks to minimise the consequence of Murraylink being unavailable. An unplanned outage would result in much greater outage time with timing

estimates up to 2 and ½ years[1]. This is likely to occur at a time when Murraylink would otherwise provide significant market benefits.

Murraylink provides the bulk of its market benefits in relatively short periods of time when there are significant price differentials between South Australia and Victoria or when Heywood is unavailable.

The Oakley Greenwood modelling indicated that 50 available spares on the commencement of the replacement would be sufficient, over most failure scenarios, to mean the replacement could be undertaken in a planned way.

4.3. Stakeholder engagement

Following the draft determination there were two workshops held where the primary focus of the workshop was the solution of Obsolete IGBTs.

Murraylink's take away from these workshops were:

- Stakeholders were comfortable with the nature of the analysis that Murraylink was doing to identify the best solution to the problem of obsolete IGBTs.
- Stakeholders were comfortable that Murraylink's take away from that analysis was that the choice for resolving the obsolete IGBT problem that had the lowest risk of not being the most prudent and efficient after the event was replacing a single phase of generation 2 IGBTs with generation 3 IGBTs.
- Stakeholders were part of the conversation that determined that an application for a contingent project is not available for this project due to the cost being below the minimum threshold for a contingent project.

4.4. Solution

For the reasons outlined above we are not proposing to include the replacement of obsolete IGBTs in the forecast capital expenditure for the next revenue reset period.

4.5. Application of the Capital Expenditure Sharing Scheme

Murraylink requires a replacement of a single phase of Gen 2 IGBTs with Gen 3 IGBTs in the future, and this may occur in the next regulatory control period (2023-2028), or the period after that (2028-2033). The cost of this project has not been included in our capital expenditure forecast due to uncertainty regarding the timing of the failure rate and depletion of reserves.

The Capital Expenditure Sharing Scheme is intended to, as stated by section 6A.6.5A(a) and section 6A.6.5A(c)(1) of the National Electricity Rules, to incentivise efficient capital expenditure during a regulatory control period. It is further reinforced in 5.1 of the AER's

[1] Murraylink has requested the advice of Hitachi, the provider of the IGBTs, as to the time period expected should we not have commenced.

capital expenditure incentive guideline that the CESS provides network service providers an incentive to spend only efficient and prudent capital expenditure.

The issue in question is not the expenditure on the project, as is demonstrated by the analysis above, it is the timing. Therefore, the CESS should not be applied in this case as it is not a matter of efficiency, but rather prudent timing.

Another factor in consideration is Murraylink's unique set of circumstances. It would be ideal for the inclusion of this project, due to its uncertainty, to be done through contingent project principles.

However, the size of Murraylink, and therefore its project costs, precludes this as a possibility, as they fall under the $30 million threshold required of contingent projects.

It is highly unlikely that for any other TNSP (other than Directlink or Murraylink), that a material project to the business (one that changes maximum allowed revenue by more than 5%), and therefore one that that application of the CESS would represent a strong penalty, could not apply for a contingent project.

Therefore, consideration of the need to exempt expenditure only arises in the circumstances where:

- An application for contingent project is unavailable because it fails only one of the limbs of rule 6A.8.1(b)(2)(iii);
- The project is identified and sufficiently defined to the AER's satisfaction before it is undertaken; and
- The reason that it is not included in the forecast capital expenditure is uncertainty as to timing, not scope.

If no action is taken, and the replacement of IGBTs is necessary, then Murraylink faces a significant financial penalty through the operation of the CESS. The possibility of penalisation would act as a disincentive.

The application of the CESS would be counterproductive in this case, as it materially punishes Murraylink for efficiently meeting its obligations under the National Electricity Law. This is contrary to the principles of the incentive scheme. EII believes that these set of circumstances are unlikely to be replicated by many other TNSPs, and an exemption would not then require further regulatory scrutiny in a large number of other revenue proposal determinations.

If the project must be undertaken in the next regulatory control period, then it should be carved out from the incentive regimes.

Comfort as to Murraylink meeting its obligations under the National Electricity Rules with regards to capital expenditure will occur because if the replacement goes ahead Murraylink will overspend its allowance, this will provide the AER the right to an ex-poste review as part of the subsequent revenue determination.

5. Forecast Operating Expenditure

Murraylink accepts the AER's draft determination to use FY 2021 as the base year.

There are a two additional operating expenditure items that have been identified that will affect forecast operating expenditure for the period financial year 2024 to 2028. This means that Murraylink is unable to accept the AER's forecast operating expenditure allowance as set out in the draft determination. Murraylink will not be able to manage its operating expenditure within the allowance as set by the AER.

In both cases the cost increases are being driven by exogenous factors to Murraylink.

The AER and other stakeholders were made aware of these cost rises when Murraylink became aware of them.

One of these is an increase in forecast insurance premiums. The other is a step change in costs related to SOCI cyber that were not included in base year expenditure.

5.1. Insurance

The proposal forecast of operating expenditure was based on the best available information at the time of the preparation of the forecast. The revised proposal is based on updated information unavailable to Murraylink at the time of the proposal.

The international insurance market is experiencing increasing premiums for liability and property insurance. The increase in expected insurance premiums have been exacerbated by events that have occurred subsequent to Murraylink's regulatory proposal. These events include:

- East Coast Floods – February to May 2022; June to August 2022; and September to November 2022
    - Australia has seen historical flood events in 2022, which JP Morgan calculates as the costliest event that Australia has ever seen. These events are still impacting river systems including the Murray River with Mildura (location of Murraylink's Red Cliffs converter station) experiencing flooding in late November 2022.
- Florida USA Hurricane Ian – September 2022
    - Expected insured losses to be USD67bn. This is set to be the second-costliest natural disaster which will impact global reinsurers (displacing Hurricane Ida which struck Louisiana in 2021). It is of note that following Hurricane Katrina (the costliest single natural disaster) in 2005, reinsurance prices increased 37% on a global basis (and 76% for US domiciled business). The expected reinsurance cost impact will be felt in 2023 as most reinsurance treaties renew on 1 January each year.

These events took the insurance premium increases from being ones that may have been manageable within the existing forecast to being material enough that Murraylink can not

manage them within the allowance proposed in the original proposal and accepted in the draft determination.

Murraylink engaged Marsh, insurance experts, to forecast insurance premiums across the reset period.

The report is provided in attachment 4.

The table below sets out the incremental insurance costs that are projected across the period.

Table 16: Incremental Insurance Operating Expenditure

Insurance (FY23 000)	FY 24	FY 25	FY 26	FY 27	FY 28
Base year (FY 2021)	503	503	503	503	503
Forecast	744	786	829	834	833
Incremental Costs	**241**	**283**	**326**	**331**	**330**

In the workshop with stakeholders where we were discussing the increase, a stakeholder raised concerns with the increasing premiums and identified that other networks were exploring alternative ways to manage their insurance arrangements to reduce premium increases.

Murraylink went away and explored the insurance issues raised by stakeholders and responded to the concerns raised.

Murraylink is different from many other networks in that it is part of a wider investment portfolio, which is owned by EII. Insurance arrangements are undertaken on the portfolio basis. As a business in a competitive environment EII is always looking for ways to minimise the long term cost of its insurance arrangements.

Murraylink and Directlink have a higher risk profile than the rest of the EII insurance portfolio but benefit from the lower insurance cost that results from being part of a portfolio rather than being a standalone business.

This means that if Murraylink tries to change its risk profile separately from the EII insurance portfolio, the first affect will be to actually increase the insurance premiums it pays as this will mean that it is insured more reflecting its individual, standalone characteristics than as part of the portfolio.

The ultimate outcome of changing risk arrangements (deductibles, limits or scope) means that Murraylink would have to take on more risk to offset the reduction in the portfolio effect before it even begins to see reductions in the premiums. This is an inefficient insurance arrangement that does not balance risk and premiums appropriately.

The most efficient arrangement is to pay the increased premiums and maintain the current level of risk rather than have a modest reduction in premiums and a disproportionate increase in risk, that if they eventuate will be passed on to consumers, that reflects Murraylink being insured as a standalone business.

5.1.1. National Electricity Rules

The right insurance arrangements are consistent with the rule 6A.6.6(a)(3)(iii) as it is necessary to maintain the quality, reliability and security of supply of prescribed transmission services in the event of material damage to Murraylink. It is also benchmarked against competitive procured standalone insurance costs and therefore is consistent with rule 6A.6.6(c)SOCI Cyber

The proposal forecast of operating expenditure was based on the best available information at the time of the preparation of the forecast. The revised proposal is based on updated information unavailable to Murraylink at the time of the original proposal.

Since the proposal EII has been informed that the standard it is going to have to meet is higher than we knew at the time of the proposal.

This is an allocation of APA cyber costs to Murraylink. The costs are same as those which were allocated to the Victorian Transmission System (VTS) as part of the revised proposal for the VTS and are under consideration by the AER currently.

The allocation of the amount is under the Management Operations Maintenance Commercial Services Agreement (MOMCSA) was not foreseen at the time of the proposal. However, in November 2022 APA has informed EII that this expenditure is required under Schedule 2.2(b) and Schedule 2.3(a). These provisions relate to expenditure that is required to meet statutory and regulatory requirements.

A business case relating to both operating expenditure and capital expenditure associated with Security of Critical Infrastructure is attached (Attachment 3).

The additional operating expenditure associated with this is set out in the table below.

Table 17: SOCI (Cyber) operating expenditure

SOCI (Cyber) ($FY23 000)	2023-24	2024-25	2025-26	2026-27	2027-28
Base year (FY 2021)	-	-	-	-	-
Forecast	128	92	91	83	83
Incremental Costs	**128**	**92**	**91**	**83**	**83**