Capital Expenditure

Energy Infrastructure

Contents

1 Introduction

The Directlink interconnector is an electricity transmission asset that transfers electricity between NSW and Queensland. It provides 180MW of capacity for AEMO to dispatch in a manner that minimises cost differentials between Queensland and New South Wales and provides power quality support in the northeast of NSW and Southeast Queensland.

The Directlink interconnector is over 20 years old and is expected to continue to operate until 2041-42. However, it is made up of a range of equipment that have different life expectancies, therefore requiring replacement or repair.

This attachment outlines Directlink' proposed capital expenditure forecast for the 2025-30 regulatory period and is focused on the long-term efficient operation of Directlink.

Consistent with the nature of the asset, Directlink has forecast several discrete capital expenditure items of the "stay in business" nature. Forecast costs for these projects are individually estimated, based on the best estimates of relevant materials costs and labour rates based on recent experience.

This approach is consistent with the AER's *Framework and Approach for Directlink*[1] and Directlink's *Expenditure Forecast Methodology*[2].

1.1 Current period

Directlink have been delivering a number of capital projects in the current revenue period (financial years 2020-21 to 2024-25) that have helped ensure the ongoing operation of Directlink for customers.

The most significant of these projects is the work being undertaken to replace obsolete Insulated Gate Bipolar Transistors (IGBTs) to ensure the ongoing operation of the converter stations.

1.2 Forecast period

The forecast period covers capital expenditure expected to be undertaken in the financial years from 2025-26 to 2029-30. It reflects best practice investment in the interconnector to minimise the possibility of greater cost increases as the result of major asset replacement.

Directlink have grouped the forecast capital expenditure projects into broader themes which are detailed in section 3.2, specifically:

- Asset Monitoring
- Major maintenance
- Safety and protection; and
- Spares management.

[1] Directlink, *Framework and Approach for Directlink*, July 2023
2 Directlink, *Proposed Forecasting Methodology*, July 2023

Under these themes, three major projects make up over 65 percent of the total forecast capital expenditure for the 2025-30 regulatory period, namely the:

- Spares Management project;
- completion of the IGBT replacement program; and
- Physical site security and public protection.

These major projects are explained in further detail in section 3.5.

1.3 Regulatory requirements

The forecast and historic capital expenditure is demonstrated to be consistent with the National Electricity Rules (Rules).

This document describes the capital expenditure categories used and the methodology adopted to forecast the capital expenditure. The major inputs and assumptions underpinning the forecasts are also explained.

The information and matters relating to capital expenditure that must be provided in Directlink's Proposal are set out in sections 6A.6.7 and schedule S6A of the Rules. The proposed capital expenditure must:

- Meet the capital expenditure objectives;
- Be allocated to prescribed transmission services in a manner consistent with the Cost Allocation Methodology;
- Include both total and year-by-year forecasts; and
- Be a reliability augmentation or have satisfied the AER's Regulatory Investment Test (RIT), if required.

Directlink's forecast capital expenditure is capital expenditure that is required to meet the capital expenditure objectives under section 6A.6.7(a):

- meet or manage the expected demand for prescribed transmission services over that period;
- comply with all applicable regulatory obligations or requirements associated with the provision of prescribed transmission services;
- maintain the quality, reliability, and security of supply of prescribed transmission services; and
- maintain the reliability and security of the transmission system through the supply of prescribed transmission services; and
- maintain the safety of the transmission system through the supply of prescribed transmission services.

Directlink's capital expenditure forecasts are presented for each year of the transmission determination from 2025 to 2030 and the total for the period. This document also compares the total capital expenditure for the current regulatory period 2020 to 2025 with the AER allowance from its last determination.

The resulting forecast capital expenditures are set out in the response to the AER's Regulatory Information Notice, which forms Attachment 7 to this proposal.

Directlink considers that the capital expenditures proposed in this document achieve the objectives set out in Rule 6A.6.7. Directlink also believes that the forecast of required capital expenditure reflects the efficient costs that would be incurred by a prudent network operator in meeting capital expenditure objectives consistent with 6A.6.7(c) as shown in this document or the accompanying attachments.

1.4 Key Assumptions

Directlink's forecast capital expenditure over the next period is based on the following basic assumptions:

- there is no change being made to the maximum capacity of the Interconnector in the period 1 July 2025 to 30 June 2030;
- the forecasts are based on current legislative and regulatory obligations and these obligations will not materially change prior to 30 June 2030;
- there is no change in the outputs delivered by the Directlink interconnector; and
- the forecast capital expenditure is designed to maintain the quality, reliability and security of supply for the Directlink interconnector and non-network options are not appropriate.

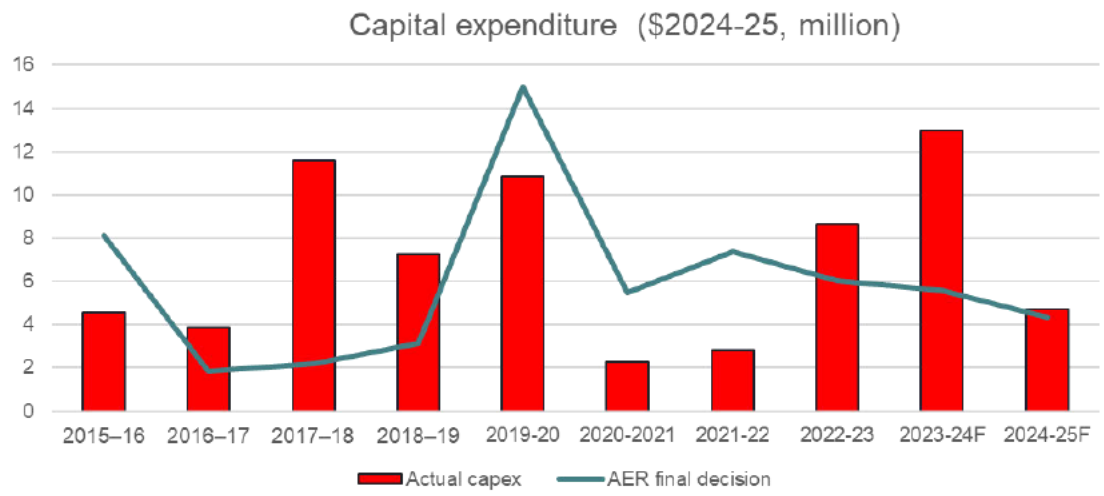
2 Historic capital expenditure

This section outlines Directlink's actual capital expenditure incurred in the current regulatory period and how it compares to the regulated capital expenditure allowances set by the AER.

Figure 2-1 shows both the actual capital expenditure during the current and previous regulatory control period in real terms and the AER's annual regulatory allowances over these periods. It demonstrates that annual variances are commonplace.

In the current determination period, Directlink has overspent the AER's capital allowance markedly in recent years, but this was balanced by significantly lower capital spending in 2020-21 and 2021-22.

Figure 2-1: Historic capital expenditure



This variance in annual capital spending is also shown in Table 2-1 in nominal terms.

The total capital expenditure by Directlink over the period is forecast to exceed the AER's allowance for capital expenditure by less than $1m, or around 2 per cent, with the lower expenditure in the first two years of the period being balanced by greater capital expenditure in 2022-23 and 2023-24.

Table 2-1: Historic capital expenditure vs AER allowance, nominal $m

Categories	2020-21	2021-22	2022-23	2023-24F	2024-25F	Total
AER allowance	4.9	6.9	6.1	5.8	4.7	**28.4**
Actual expenditure	2.0	2.6	7.6	12.1	4.8	**29.1**
Variation	*-2.9*	*-4.3*	*+1.4*	*+6.3*	*+0.1*	***+0.6***

This variation, both annually and in total, has largely been driven by the amount and timing of Directlink's capital expenditure on IGBTs.

IGBTs are semiconductor switching devices, part of the converter stations that are central to the operation of Directlink. IGBTs assist with switching power from AC to DC and the Directlink interconnector cannot operate without them.

Expenditure on IGBTs was a large component (over 60 per cent) of the AER's capital expenditure allowance for the current regulatory period but there have been several major factors that have delayed Directlink's planned expenditure in the current period. These have included:

- the initial impact of Covid on the supply of IGBTs early in the period;
- extended limited supplies driven by both the Covid interruptions and subsequent general supply chain shortages;
- increased demand given the global trends towards decarbonisation and electrification driving a greater need for high voltage transmission projects; and
- the impact of these factors on Hitachi, Directlink's contracted supplier and single source of IGBTs.

The consequences for the IGBT Project are detailed below.

2.1 IGBT Project

There are approximately 4,440 existing IGBTs ('Generation One IGBTs') that were installed as part of the initial design of Directlink (commissioned in 1999). The equipment that houses and operates them is the intellectual property of Hitachi ABB Power Grids and there is no alternative economic provider for these IGBTs.

The IGBT project, replacing a proportion of the Generation One IGBTs, is necessary to maintain the reliability of Directlink and was accepted by the AER at the last determination.

The AER noted that the progression of the replacement investment would be subject to the successful completion of a RIT-T[3] which has progressed to the Project Assessment Draft Report (PADR) in February 2022.

Table 2-2 shows the regulatory allowance on IGBTs allowed by the AER and the actual expenditure on IGBT's in the current regulatory period. The divergence in spending on IGBTs largely explains the divergence in capital expenditure over the current regulatory period.

Contractual terms with Hitachi, the supplier of IGBT's, meant the delivery of the project has not taken place as assumed by Directlink and as reflected in the capital expenditure forecasts for the current regulatory period. Hitachi was contracted for a one-off project rather than a long-term service agreement but the delivery of the replacement IGBTs has not occurred under this assumed model but instead, on an individual project by project replacement basis.

The changes in the nature of the solution for IGBT replacement and the difficulties with fulfilling these contractual terms has resulted in some of the IGBT expenditure planned for the current regulatory period having to be included in the first year of the forecast regulatory period 2025-30.

Total expenditure on the IGBT project to 2026 will be $25.3 million with $19.0 million in the current regulatory period from 2020 to 2025 and $6.3 million in the following

[3] AER, Directlink *Transmission Determination 2020 to 2025. Final Decision, Attachment 5 -Capital expenditure*, June 2020, p. 11.

regulatory period from 2025 to 2030. Noting, the AER allowance for the project was $17.5 million in the current regulatory period from 2020 to 2025.

Table 2-2 : Historic IGBT capital expenditure vs AER allowance, nominal $m

IGBT Capex	2020-21	2021-22	2022-23	2023-24F	2024-25F	Total
AER allowance	1.7	3.6	3.9	4.1	4.2	**17.5**
Actual expenditure	0.0	1.2	6.1	10.3	1.4	**19.0**
Variation	*-1.7*	*-2.5*	*+2.2*	*+6.2*	*-2.8*	***+1.5***

Directlink has therefore undertaken the IGBT project in two phases as the most prudent and efficient means of resolving the issue with the analysis supporting the RIT-T for the project demonstrating:

- that the project used the best available forecast consistent with the Rules;
- the external nature of the change in circumstances;
- the materiality of this expenditure to Directlink; and
- that the actual capital expenditure meets the requirements of the Rules

The fulfilment of the IGBT project will have an impact on Directlink's proposal for the application of the CESS incentive scheme and this is discussed in further detail in section 7 of Directlink's Revenue Proposal[4].

[4] Directlink, *Attachment 03 - Directlink Revenue Proposal,* January 2024

3 Capital expenditure forecast methodology

The chapter describes Directlink's capital expenditure themes, capital cost categories and the methodology adopted to forecast capital expenditure.

The capital expenditure described in this Proposal is not growth related but instead directed at maintaining the capability and reliability of the network, whilst ensuring that all regulatory, statutory and legislative requirements are met.

The major projects that contribute to the capital expenditure forecast are described including how they are consistent with APA's project management policies and procurement standard (see Attachment 4c).

The forecast capital expenditure is then demonstrated to be efficient.

Directlink considers that this revenue proposal achieves the capital expenditure objectives set out in section 6A.6.7 of the Rules. Directlink also considers that the forecast of required capital expenditure reasonably reflects the efficient costs that would be incurred by a prudent network operator in meeting the capital expenditure objectives consistent with 6A.6.7(c).

3.1 Asset Management System

Energy Infrastructure Investment (EII) has an Asset Management Plan (AMP) that identifies the necessary actions required to optimally manage its assets. A long-term consideration of the integrity of assets is necessary to ensure that they remain fit-for-purpose. The AMP is based on the best-known information at the time of writing.

The purpose of the AMP is to:

- provide a comprehensive understanding of the current management approach relating to the assets, their condition and their utilisation;
- identify strategic recommendations for future utilisation;
- provide a platform for approval of work programs by providing discussion of the options available and recommendations; and
- identify specific issues affecting the assets and the proposed remediation for budget consideration.

The objective of the AMP is to ensure that a strong focus on safety, reliability and efficiency is maintained in relation to the operation and management of the EII assets. In developing the operating and maintenance procedures incorporated within the AMP, the Operator (being APA Operations) has considered the approved policies and procedures of the APA Group.

Suitable safety management systems are in place and operating to ensure that the risks relating to the operation of all EII assets are effectively managed to keep risks as low as reasonably possible. The APA HSE Management System (Safeguard) provides a framework by which the processes relating to EII's HSE activities are written, approved, issued, communicated, implemented, and controlled. Additionally, the management system is also subject to review and improvement to ensure objectives and obligations are continually satisfied.

The AMP is reviewed each year to ensure that the content is current. Although changes to the assets will inevitably occur during the life of the AMP, it is only intended to amend

the AMP at each annual review unless there are significant issues identified that would impact its validity. The AMP will identify any material changes to budget items for the previous period.

The Asset Management Plan is reviewed and adjusted by the EII Board each year in accordance with their consideration of the requirements of Directlink.

A copy of the Directlink AMP is included in Attachment 04a.

3.2 Capital expenditure themes

As part of the AMP, a range of capital expenditure measures are identified and evaluated over the 2026-30 regulatory control period. The themes are focussed on improving asset integrity, reliability and the overall safe and effective operation of assets in conjunction with the need to protect electricity consumers from inefficient investments.

The program of forecast capital expenditure is outlined in the business cases included within attachment 4d. These business cases explain how each project meets the capital expenditure objectives and capital expenditure criteria set out in the Rules at clauses 6A.6.7(a) and 6A.6.7(c) and highlight the recommended approach and the cost estimates derived during this process.

3.2.1 *Asset monitoring*

This category of capital expenditure is focussed on improving the current capabilities to monitor and manage asset integrity, reliability and the overall safe and effective operation of assets. It includes uplift of:

- asset data acquisition monitoring capabilities;
- communications infrastructure; and
- remote access equipment.

An assessment of the following projects is included in the asset monitoring business case:

- Operations asset integration;
- Uplift of the Computerised Maintenance Management System;
- Asset information; and
- Master controller feasibility study.

3.2.2 *Major maintenance*

This program of forecast capital expenditure is for larger itemised preventative maintenance works and involves periodically replacing or refurbishing critical major equipment and plant components based on their condition and likelihood of failure.

Major maintenance is considered capital expenditure as it provides the economic benefit of extending the life of the asset to its full economic life.

A summary of the following projects is included in the business case in attachment 04d:

- Circuit breakers;
- Fire system updates;

- Reactor cooling reliability improvement;
- Land grading;
- Circulating cooling water (CCW) system preventative maintenance;
- Cable modification;
- Cable tray installation and cable relocation; and
- Major capital maintenance.

3.2.3 Safety and protection

This category of capital expenditure seeks to maintain Directlink's reliability by maintaining the integrity of the asset, including the site facilities, equipment storage and protection systems.

These activities take into consideration the criticality of the asset, employee and contractor health and safety, as well as protecting the public from risks associated with High Voltage Direct Current (HVDC) plant and ensuring ongoing operational reliability. This theme also includes a component for improving security of critical infrastructure (SOCI).

The evaluation of the major projects for safety and protection is included in the business case:

3.2.4 Spares management.

The objective of the strategic spares management project is to ensures the ongoing reliable operation of Directlink at the lowest long-term cost to customers. It involves the systematic identification, procurement, storage, and utilisation of spare parts to support equipment maintenance and address unforeseen breakdowns.

This spares management project addresses two risks to Directlink's ongoing reliable operation:

- the increasing lead times for procuring spares due to global supply issues; and
- obsolescence of key components.

A complete review of Directlink's spares strategy is being conducted and feedback from recent stakeholder engagement on the approach has been received.

Based on known improvements in sparing required, APA has estimated what is required to be spent on capital spares and storage over the next transmission determination period. This may be slightly adjusted based on stakeholder feedback, the outcome of the external review and supplier quotations that will inform lead times and spend phasing.

3.3 Non-Network alternatives

Given the nature of the forecast capital expenditure is on the replacement and maintenance of existing assets, Directlink has not identified any non-network alternatives to the proposed projects.

3.4 Forecasting methodology

Directlink's forecast of capital projects was developed in the context of its asset management practices and is categorised as Replacement and Refurbishment. These management practices and a description of the associated projects are discussed in the AMP[5] as approved by the EII Board in November 2023.

The AMP follows the strategic direction established in the Asset Management Strategy and details the asset management processes and lists individual maintenance and improvement projects. This document has been supplemented with documents outlining the business cases for the significant projects that are expected to be required during the regulatory control period (see Attachment 4d).

Projects to replace or refurbish equipment components are prepared when:

- service performance of the equipment deteriorates and jeopardises the reliability and availability performance of the link;
- maintenance costs escalate and it becomes economic to replace or refurbish the equipment; or
- equipment associated with auxiliary systems becomes obsolete and the unavailability of spares has the potential to jeopardise the availability of the interconnector.

The forecast capital expenditures are based on the cost estimates derived in the preparations of these projects. The only adjustments relate to conferring calendar year values into fiscal years and changes that relate to additional information available to Directlink post the AMP approval in November 2023. This relates to capital expenditure for obsolete IGBTs and the spares management strategy.

3.4.1 Project scope, cost, and timing estimates

Directlink's approach to estimating the scope, cost and timing of the projects that comprise the capital expenditure program is set out in Table 3-1.

Table 3-1: Project scope and costs estimates

Expenditure Category	Refurbishment	Compliance	Capability (Contingent)
Project Scope	All projects are small in scope and readily specified.		Not able to be fully determined at this stage
Project Timing	Based on equipment condition.	As soon as is reasonably practicable.	Pending detailed analysis, not able to be determined at this stage.
Project Cost Estimate	Based on similar minor works carried out for Directlink, or by obtaining a quotation for the work from existing service providers.		Not able to be accurately estimated at this stage, based on generic estimating procedures.

[5] Directlink, *Attachment 04a - Asset Management Plan*

3.5 Significant elements of capital expenditure program

The capital expenditure themes described in section 3.2 are further detailed in the business cases within attachment 04d. These business cases explain how each project within the capital expenditure theme meets the capital expenditure objectives and capital expenditure criteria set out in the Rules at clauses 6A.6.7(a) and 6A.6.7(c).

Several projects make up a significant proportion of the capital expenditure program and are set out in further detail below.

3.5.1 Spares Strategy

This project procures spare parts essential for the ongoing operation of the Directlink interconnector such as capacitors and cables and the expenditure in this category has increased.

The key functions of the converter system are manufactured by Hitachi, the major supplier of spares for Directlink, and it is not possible to source many spares from an alternative supplier. Due to factors beyond Hitachi's control, such as global supply chain constraints; there have been occasions where notification of the withdrawal of support has been issued with very limited notice.

There is currently a seven-year lead time on ordering and delivery of cable. A deposit is paid at the initial ordering of cable then payments are made on the delivery of cable. Storage for the spares is also a significant cost of the spares management strategy as certain spares require temperature-controlled storage. Directlink's preference for both security and reliability reasons are to maintain the spares storage on site.

Hitachi has also indicated they may cease manufacturing of certain spares such as dry-HED capacitors. This will require Directlink to purchase a significant proportion of spares in the next regulatory period 2025 to 2030 to align with the end of life of the asset in 2042. The use of spares during the remaining life of the asset is important to maintain reliability of the operation transmission asset. This forecast expenditure for the 2025-30 regulatory period includes all spares for critical equipment to support the asset until end of life in 2042.

Table 3-2: Forecast capital expenditure on spares ($m real 2024-25)

	2025-26	2026-27	2027-28	2028-29	2029-30	Total
Directlink Spares	1.8	1.2	1.7	1.6	6.2	12.5

The capital expenditure forecasts in Table 3-2 are the best available estimates based on the expected cost of some components that are expected to be incurred. The capital expenditure as outlined in this proposal is consistent with the National Electricity Objective and the requirements of the National Electricity Rules as it necessary to maintain the reliability of the network consistent with Rule 6.A.6.7(a)(3)(i).

3.5.2 Physical site security improvement

Directlink has identified increasing risks of site security breaches that could result in loss of spares/cable and major asset damage and extended outage. Break-ins have occurred at several electrical transmission and generation sites within APA and across Australia. These have been increasing in frequency in recent years.

Directlink's recommendation is to implement a site security improvement project that includes:

- Improved fencing;
- Improved 24/7 site monitoring through CCTV;
- Expanding electronic access control systems including door alarms; and
- [redacted]

Table 3-3: Forecast capital expenditure on physical site security ($m real 2024-25)

	2025-26	2026-27	2027-28	2028-29	2029-30	Total
Physical site security	[redacted]					

The benefits of the capital expenditure forecast in Table 3-3 include:

- Reduced risk of break-ins, asset damage and loss of parts;
- Reduced risk of outages due to major asset damage;
- Improved compliance with critical infrastructure asset requirements; and
- Avoids any increase in operational expenditure for the 2025 to 2030 regulatory period

3.5.3 Completion of IGBT Project

The IGBT project, described in section 2.1, was accepted by the AER at the last determination. Changes in the IGBT replacement program require expenditure to occur in the first year of the forecast regulatory period 2025-30 as shown below.

Table 3-4: Forecast capital expenditure on IGBTs ($m real 2024-25)

	2025-26	2026-27	2027-28	2028-29	2029-30	Total
IGBT expenditure	6.1	-	-	-	-	6.1

3.6 Regulatory Determination Costs

Directlink is proposing to capitalise external expenditure associated with the regulatory reset. This expenditure is directly for the purposes of putting together a regulatory submission that is compliant with the requirements of the Rules.

Consistent with the accounting treatment of Directlink, these are costs that are specifically identified for regulatory purposes and directly charged by APA. In this instance, it is costs from the use of consultants and experts external to APA. All other costs relating to regulatory staff, engineers, and accounting staff of APA are assumed to be covered by the commercial management charge under the MOMSCA.

The forecast costs are associated with establishing the stakeholder engagement over the next transmission determination period. These are advisory costs associated with the establishment and implementation of the program specific to the revenue determination and do not include the cost of APA staff executing the stakeholder engagement program. This cost is based on estimates provided to APA by Newgate Research. There are also costs associated with external engineer expertise used to prepare the submission documents and justifications.

Table 3-5: Forecast capital expenditure on regulatory determination ($m real 2024-25)

	2025-26	2026-27	2027-28	2028-29	2029-30	Total
Determination costs	0.0	0.0	0.0	0.1	0.1	0.3

4 Capital expenditure forecasts

This chapter contains Directlink's capital expenditure forecasts for each year of the 2025-30 transmission determination period, as well as the total expenditure for the period.

4.1 Forecast capital expenditure, by program

Table 4-1 below shows proposed capital expenditure for the regulatory period, 2025 to 2030, by program.

Table 4-1: Forecast capital expenditure by asset program ($m real 2024-25)

Program	2025-26	2026-27	2027-28	2028-29	2029-30	Total
Safety and Protection	3.7	1.1	0.2	0.0	0.0	5.0
Major Maintenance	1.4	2.0	2.2	2.1	0.9	8.6
Asset Monitoring	0.8	0.2	0.1	0.1	0.1	1.3
Spares Management	1.8	1.2	1.7	1.6	6.2	12.5
IGBTs	6.1	0.0	0.0	0.0	0.0	6.1
Determination costs	0.0	0.0	0.0	0.1	0.1	0.3
Total	**13.8**	**4.5**	**4.2**	**3.8**	**7.2**	**33.8**

There are no contingent projects proposed for Directlink.

4.2 Forecast capital expenditure, by asset class

The forecast capital expenditure required to maintain the prescribed transmission services by Directlink during the 2020-25 regulatory control period is set out in Table 4-2.

Table 4-2: Forecast capital expenditure by asset class ($m real 2024-25)

Asset	2025-26	2026-27	2027-28	2028-29	2029-30	Total
Transmission assets	11.0	3.4	4.1	2.8	7.2	28.4
Determination costs	0.0	0.0	0.0	0.1	0.1	0.3
Easements	0.2	0.0	0.0	0.0	0.0	0.2
Land	0.0	0.0	0.0	0.0	0.0	0.0
Buildings	2.6	1.1	0.1	1.0	0.0	4.9
Total	**13.8**	**4.5**	**4.2**	**3.9**	**7.4**	**33.8**

4.3 Forecast capital expenditure, by category

The demand for Directlink's service will remain equal to its maximum capability throughout the 2025-30 transmission determination period. The capital expenditure described in this proposal is therefore not growth related. Expenditure is directed at maintaining the capability and reliability of the network, whilst ensuring that all regulatory, statutory, and legislative requirements are met.

The major items of plant that comprise Directlink: the convertor equipment; transformers; harmonic filters; and cable, have to be maintained in serviceable condition in accordance with the manufacturer's recommendations.

The RIN requires Directlink to provide the capital expenditure by investment driver. The projects that can go to make up the proposed capital expenditure program are associated with the following investment drivers:

- Augmentation/Expansion: This is capital expenditure that is associated with the augmentation or expansion of the capacity of the Directlink network.
- Replacement/refurbishment: The refurbishment or replacement of items of auxiliary equipment, necessary for the continued reliable and secure operation of the link.
- Non-System: This is capital expenditure that is associated with the provision of network services but is not directly on the network itself.

However, Directlink did not have any expenditure in the Augmentation/Expansion in the current period and is not forecasting any in the next period.

To assist the AER's understanding of the capital expenditure program, capital expenditure projects have been subdivided into categories that reflect these principal drivers in the table below.

Table 4-3: Forecast capital expenditure by driver ($m real 2024-25)

	2025-26	2026-27	2027-28	2028-29	2029-30	Total
Augmentation/expansion	0.0	0.0	0.0	0.0	0.0	0.0
Replacement/refurbishment	13.8	4.5	4.2	3.9	7.4	33.8
Non-System	0.0	0.0	0.0	0.0	0.0	0.0
Total	**13.8**	**4.5**	**4.2**	**3.9**	**7.4**	**33.8**

5 Glossary

AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
Capex	Capital Expenditure
CESS	Capital Expenditure Sharing Scheme
DC	Direct Current
EBSS	Efficiency Benefits Sharing Scheme
GW	Gigawatt
GWh	Gigawatt hours
HVDC	High Voltage Direct Current
ISP	Integrated System Plan
MNSP	Market Network Service Provider
MW	Megawatt
MWh	Megawatt-hour
NEM	National Electricity Market
Rules	National Electricity Rules
NSP	Network Service Provider
NSW	New South Wales
Opex	Capital Expenditure
PTRM	Post Tax Revenue model
RAB	Regulatory Asset Base
Rules	National Electricity Rules
STPIS	Service Target Performance Incentive Scheme
TNSP	Transmission Network Service Provider
WACC	Weighted Average Cost of Capital