2023-27
POWERLINK QUEENSLAND REVENUE PROPOSAL

Supporting Document – PUBLIC

IT04 Information, Analytics and Insights 2023-27

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EXECUTIVE SUMMARY

This Investment Case documents the justification for planned investment in Information, Analytics and Insights. It is based on the planning undertaken to date and the estimated costs of development, implementation, ongoing operations and maintenance, the anticipated business values to be gained and associated risks.

It is proposed to invest in Information, Analytics and Insights capability and process improvement over the period FY22/23 to FY26/27. The proposed investment is required to address the following drivers:

- **Requirement for renewal of IT systems capability for sustainability, supportability and security.**

  Several of the systems supporting Powerlink's Information, Analytics and Insights / Business Intelligence (BI) capability will be approaching end-of-life. This renewal investment is therefore needed to provide efficient, sustainable and secure systems capability to support BI. This renewal is consistent with established IT asset lifecycle management principles.

- **Enable Powerlink's requirement for data driven fact-based decision capability**

  It is anticipated that the combination of improved interoperability with a wider variety of data sources and new technology will provide more meaningful insights to the business.

- **Leverage the renewal opportunity to rationalise systems where prudent**

  New systems are typically more capable and as such may offer opportunities for rationalisation reducing complexity and enabling Powerlink to focus skills development and support on fewer systems.

- **Leverage the renewal opportunity for improved interoperability resulting in improved business insights**

  As Powerlink continues to develop its data driven fact-based decision capability, demand for systems integration is expected to continue to mature.

The risk benefits gained from investment in the recommended option will reduce likelihood of operational impact as a result of system downtime, ineffective business workarounds and toolsets providing limited data for decision making, and contribute to cybersecurity risk reduction through optimised, modern capability.

The following options are considered:

- **Option 1: Base Case (Counterfactual) – Retain existing systems, limiting use to current capabilities and defer replacement**
- **Option 2: Cyclic renewal of Business Intelligence (BI) applications leveraging the opportunity to rationalise the BI application portfolio (Recommended)**
- **Option 3: Replace the BI Application Portfolio and move to contemporary platforms**

The initiative value assessment results reflect on or exceeding 75% across three assessment parameters and one parameter at the 63rd percentile.

It is recommended that Option 2 be implemented as the least cost solution to meet the identified need. Total forecast non-network (IT) expenditure for the recommended option is [redacted] capex and [redacted] opex (FY21/22 real terms) with an NPV benefit of $0.19 million relative to the base case counterfactual.

1. INVESTMENT NEED

1.1. Problem / Opportunity

In all large organisations, the scale of captured data is continuing to grow. Such large data volumes can become a burden to manage, maintain and share. This information can however serve the business, providing knowledge on an as-needed basis which informs efficient decision making and consistent, credible operational and statutory reporting. Powerlink has already taken strides in harnessing our information holdings through our corporate data warehouse and analytical tooling. We are now continuing that process of improvement with our data strategy which focuses on:

- Creating a data culture to deliver higher stakeholder and customer value
- Developing a cohesive view of data and information across the organisation
- Effective data governance and data lifecycle management
- Data accessibility and trust to drive innovation
- Fact-based decisions driving better business and customer outcomes

Powerlink has also increased its maturity in data management through a business initiative to deliver tangible data management and governance measures based on an agreed Data Strategy. This ongoing work is seeking to improve overall data quality and timeliness leading to improved decision making.

The current solutions face increasing challenges in driving more effective and efficient business decisions in the longer term. These challenges necessitate a continued evolution of the Powerlink's BI capability.

Specifically, Powerlink will face challenges in meeting this need due to the following factors:

- Increasing volumes of data
- Increasing needs for analysis
- Expectations for answers to be provided in a shorter timeframe
- Increasing number of staff who need the ability to undertake data mining and analytics to support planning, maintenance and regulatory information.
- The need for agility in the sourcing and provision of data for analytics

Addressing these challenges requires the renewal of IT systems capability for sustainability, supportability and security. As part of the renewal Powerlink will seek to rationalise systems where prudent.

Responding to the need to drive decisions through fact-based data, increasing the level of interoperability will improve the trust in data, timeliness of its delivery and highlight improvements in the management of source data across the business.

1.2. Investment Objectives

This investment in Information, Analytics and Insights will deliver on the following objectives:

- Ensure the information management and analytical tools environment meets Powerlink's analytical needs.
- Ensure supported and sustainable core systems enabling Powerlink's BI suite to meet current and future needs.
- Support efficiencies and information accuracy / integrity through:
  - Automation of data collection from information sources and network assets
  - Implementation of automated data quality checks
  - Further maturing and support for data governance across the enterprise

- Support for managing and rectifying data issues in a timely manner.

1.3. Alignment with IT Application Management Guidelines

Powerlink's applications are maintained for supportability, sustainability and security consistent with application asset lifecycle management (ALM) principles aligned with the "PACE" model developed by global research and advisory firm Gartner.

Under the Gartner PACE model, applications are classified as either Systems of Record, Systems of Differentiation or Systems of Innovation with considerations of:

- The nature of business processes supported by the application;
- The pace of change in both the business areas and technology domain;
- The strategic focus for the business area;
- The nature of stakeholder ownership; and
- Risk and funding models.

Consistent with these various considerations, the PACE model identifies typical expected application service lives and the corresponding prudent planning horizons. The guidelines provide forecast upgrade and renewal timeframes based on these classifications to maintain effective, sustainable and supportable business solutions across an asset's lifecycle.

Figure 1 (below) depicts the Gartner PACE model's expected application service lives and planning horizons for each application category, as well as Powerlink's corresponding asset lifecycle management guideline applicable to each category.

Classification	Systems of Record	Systems of Differentiation	Systems of Innovation
Lifetime *How long it usually stays in layer*	5 to 10 years or longer	2 to 5 years	3 to 12 months
Planning Horizon *How long you describe the plan in application strategy*	More than 7 years	1 to 2 years	As long as 6 months
Powerlink Asset Lifecycle Management Planning Guidelines	Structured minor releases Upgrade each 3 to 5 years Replace at 10 to 15 years	Upgrade each 2 to 3 years Replace at 6 to 8 years	Typically not upgraded unless provided as evergreen or cloud

Figure 1: Gartner PACE model and Powerlink ALM planning guidelines

An assessment of the systems within scope of the proposed investment are listed below with the relevant PACE model classification.

System / Repository	Implemented (Year)	Last Major Upgrade (Year)	Classification
Wherescape	2018	2018	System of Differentiation
Alteryx	2016	2016	System of Differentiation
Collibra	2018	2016	System of Differentiation
EDW	2012	2012	System of Record
BIDW	2016	2016	System of Record
Tableau	2016	2016	System of Differentiation
Microsoft SQL Server Integration Services	1990s	2012	System of Differentiation
Data Services SAP	2016	2016	System of Differentiation

Table 1: Existing systems in scope for renewal

1.4. Compliance Requirements

BI systems play an important role in enabling Powerlink to meet its statutory, regulatory and legal obligations as a transmission network service provider (TNSP). The table below details the obligations supported through the proposed investment.

Obligation	Description of Requirement
Workplace Health & Safety Compliance	Powerlink's BI landscape provides visibility of key aspects of the business operations, particularly in the form of reporting against agreed KPIs and highlighting growth in risk factors. A lack of visible data and trends can impact WH&S compliance and result in adverse impacts relating to: • Trend analysis highlighting risk factors for OH&S • KPI reporting This investment will ensure that Powerlink maintains compliance with Workplace Health and Safety requirements.
Regulatory Reporting	Ability to generate accurate regulatory and reliability reporting, which is heavily dependent on BI systems, could be compromised by system failures or limited support mechanism for aged systems.
Security	The management of data governance and permitted access is paramount to ensure the security of sensitive data and the integrity of all data.

Table 2: Compliance Requirements

1.5. Investment Overview

We have a number of systems we are responsible for maintaining. Powerlink has a responsibility for maintaining those in line with the application lifecycle process. Powerlink's BI systems and processes are core to the provision of data to support decision making for all key business areas and functions. The proposed investment in rationalisation of the BI capability is essential for ongoing efficient and sustainable business operations. The proposed target state will result in a reduction of the number of Data Warehouses and the tools to build, monitor and interrogate those data warehouses. The use of near real time reporting offered by S/4 Hana along with further expansion of the use of SAP Analytics Cloud will be two opportunities to reduce the data warehouse footprint within Powerlink.

1.5.1. Current State (2020)

The current suite of applications providing the BI capability in Powerlink is summarised in Table 3 - BI Application Suite below:

The systems were implemented with the objective of supporting the construction, ongoing maintenance of data warehouses and presentation of data as well as enabling the emerging data governance processes though data stewardship with control through workflow review and approval processes.

System / Repository	Purpose	Type	Vendor
WhereScape RED and 3D	Designing, developing and configuring the Data Warehouses	COTS	WhereScape
Alteryx	Workflow based data modelling, segmentation analysis and data wrangling.	COTS	Alteryx
Collibra	Data Governance, security and workflow, Business Glossary, Metadata Management, Data Lineage	COTS	Collibra NV
EDW	Asset centric Data Warehouse	In House / Oracle	Powerlink Queensland
BIDW	Corporate Data Warehouse	In House / Microsoft SQL Server	Powerlink Queensland
ACMS	Asset Condition Monitoring System	In House / Oracle	Powerlink Queensland
Tableau	Data Presentation	COTS	Tableau Software
Microsoft SQL Server Integration Services	Extract, Transform Load Services	COTS	Microsoft
Data Services SAP	Extract, Transform Load Services	COTS	SAP
SAP Analytics Cloud	Finance Centric Data Warehouse	COTS / In House	SAP

Table 3 - BI Application Suite

2. INVESTMENT OPTIONS

The following options have been considered to address the investment needs identified in Section 1.

Option	Description
Option 1 - Base Case (Counterfactual) – Retain existing systems, limiting use to current capabilities and defer replacement	No significant investments in Powerlink's current suite of BI and warehouse tools will be undertaken in the 2023-27 regulatory period, with renewal deferred until the next period (2028-32).
Option 2: (Recommended) Cyclic Renewal of BI Applications leveraging the opportunity to Rationalise the BI Application Portfolio	It is proposed to invest in cyclic renewals of Information, Analytics and Insights platforms consistent with Powerlink's application asset lifecycle management (ALM) principles over the period FY22/23 to FY26/27. The rationalisation is expected to deliver improved insights as a result of newer, more capable, contemporary technologies as well as an opportunity to rationalise the portfolio of systems. Specific activities will include: • Improving data collection automation capability. • Improving interoperability with key systems. For example, Next Generation Network Operations initiative (e.g. Energy Management System) to provide richer asset performance and condition data. • Rationalise BI and warehouse toolsets where the capabilities can be consolidated in S/4 Hana, SAP Analytics Cloud or other tools • Continued improvement in SAP Analytics Cloud capability
Option 3: Replace the BI Application Portfolio and move to contemporary platforms	Industry advances in the BI and Artificial Intelligence space may offer significant innovation options to Powerlink, particularly in the area of Cloud based solutions. In line with this context, option 3 proposes to test the market for contemporary solutions with a view to replace the suite of BI systems that favour and leverage emerging trends such as Augmented Analytics (AA), Machine Learning (ML), Artificial Intelligence (AI) and self-service.

Table 2: Investment Options

Each of these options is evaluated in the sections which follow.

2.1. Option 1: Base Case (Counterfactual) Retain existing systems, limiting use to current capabilities and defer replacement

The base case (counterfactual) is an assessment of the forecast expenditure and implications if the proposed option(s) do not proceed.

Under this option, renewal of BI systems capability would be deferred until the 2028-32 regulatory period. Investment in the BI warehouses and toolsets during the coming period would be limited to maintenance upgrades to ensure the products remain supportable (where feasible) with no new major releases being implemented.

2.1.1. Base Case assumptions

This base case has been estimated based on the following assumptions.

2.1.1.1. Construction Cost and Scope Assumptions

- Annual investment over the coming regulatory period will be limited to supporting maintenance and minor upgrades to maintain support.
- Necessary lifecycle renewal of existing hardware, operating system and database management systems will occur as part of other funded initiatives.
- While a replacement investment will not be undertaken in the 2023-27 period, it would be required in the 2028-32 period. At that point, the costs of the renewal are based on the assumptions detailed in Option 2, escalated by 15% in recognition of the increased complexity of the deferred systems replacement as the existing application versions fall further out-of-date.
- Given the pace at which this field is evolving, no replacement in the 2023-27 regulatory period presents two key challenges.
    - Powerlink will be unable to benefit from improved insights over the coming 2023-27 regulatory period.
    - The 2028-32 regulatory period replacement will involve more complex migrations as a result of upgrading or replacing ‘legacy’ systems.

2.1.1.2. Operating Cost Assumptions

- Given the addition of the BI toolsets to the application portfolio, pursuing minor upgrades to maintain supportability will mean no extended vendor support will be required. Costs to operate will be in line with current support costs with some investment in order to deliver upgrades. If more substantial upgrades are required and not pursued there is a risk that BI tool sets may not be supported and access to essential data for BI supported decisions may not be available. Annual L&M costs will be escalated in line with standard escalation rules.

2.1.1.3. Other Assumptions (Non Financial)

- Investment in underlying technologies will continue to provide stable and reliable platforms that meet any performance requirements, including those resulting from increased data volumes.
- Business demand for contemporary BI capabilities will not be met during the reset period.

2.1.2.Base Case Benefits

The following benefits may be achieved with selection of this base case option.

Benefit Description	Financial Value ($M Real 2021/22 p.a.)
B1. Minimise Business Disruption Minimises businesses change disruption through continuation of existing work practices.	N/A (Non-Financial)

Table 5 - Option 1 - Base Case Benefits

2.1.3.Risk Mitigation

Table 4 - Option 1 - Base Case Risk Mitigation (below) summarises the inherent risks which would be experienced by the end of the coming regulatory period (2023-27) if the base case (counterfactual) option is selected.

The equivalent risk analyses provided with the recommended option (Option 2) and the alternative option (Option 3) have been conducted with respect to their effectiveness in mitigating the below base case risks. This assessment has been undertaken in alignment with the Powerlink risk management framework.

Risk Description	Inherent risk 2027	Risk Level
R1 – Business operational impact Loss of access to BI data and toolsets due to system failure or data corruption, coupled with ineffective business workarounds and limited ability to progress any major updates/upgrades. **Risk categories – (Workplace Health and Safety Compliance, Market Obligations, Regulatory reporting, Security)**	While the systems are generally stable, by 2027 there is potential for failure if major upgrades are not pursued. Outages will result in the inability meet statutory and financial reporting requirements (e.g. End of Month) and to report on KPIs and trend analysis without the need for workarounds and manual data analysis. **(Possible, Minor)**	**Moderate**
R2 - Business operational impact Ineffective BI toolsets leads to business units not being able to support decisions with data. **Risk categories – Business Operations**	While access to source data will remain, the inability to consume this in a manner will hamper the effectiveness of business decisions. To facilitate decision making manual data curation would need to be undertaken which will impact the timeliness of data. **(Possible, Minor)**	**Moderate**
R3 – Cybersecurity With the inability to progress major systems updates/upgrades, including access control/security updates, and the growing sophistication of cybersecurity attacks, there is increasing potential for: • undetected data corruption or manipulation • disclosure of stakeholder information or sensitive documents to unauthorised users.	The energy sector is considered a high threat area for cyber-attacks. Up-to-date systems are considered a base level defence against a range of these threats. An aging system profile increases the threat opportunity. **(Possible, Moderate)** A successful cyber-attack resulting in a system outage, data corruption and undetected data manipulation or information disclosure may lead to disruption of normal business operations, project delays, safety issues and	**Significant**

Risk Description	Inherent risk 2027	Risk Level
Risk categories – Security	external stakeholder concerns. (**Possible**, **Moderate**) There are no further mitigations within the current solution beyond manual measures	

Table 6 - Option 1 - Base Case Risk Mitigation

Figure 2 - Option 1 - Base Case - Summarised Risk Profile below summarises the risk position of adopting the base case (assessment of each risk tabled above).

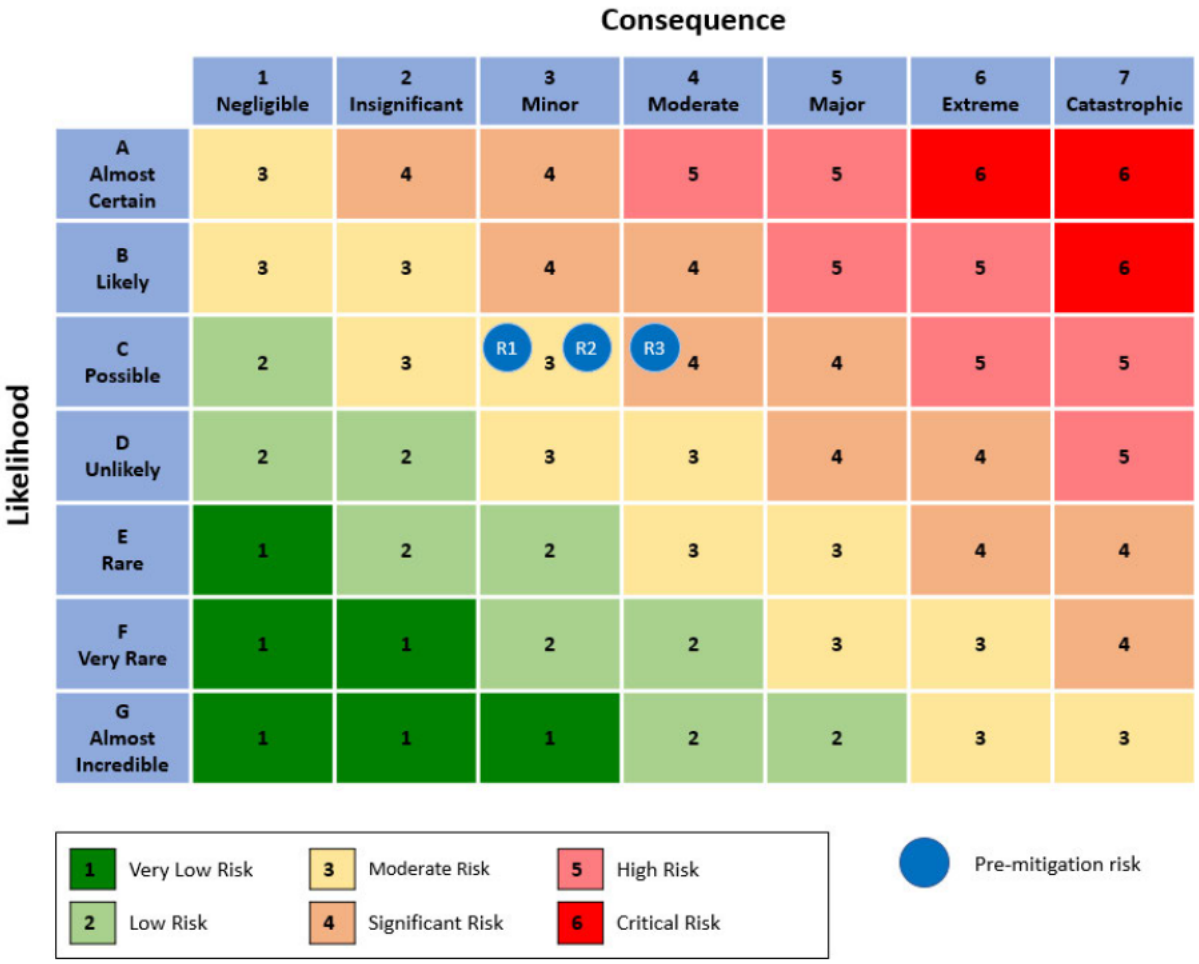

Figure 2 - Option 1 - Base Case - Summarised Risk Profile

2.2. Option 2: (Recommended) Cyclic Renewal of BI Applications leveraging the opportunity to Rationalise the BI Application Portfolio

In line with Powerlink's Asset Lifecycle Management approach, existing BI tools will be subject to cyclic review to ensure they meet current and planned future capabilities as part of any investment decision. New systems are typically more capable and as such may offer opportunities for rationalisation. Where the capabilities of a tool can be provided by an existing tool, the intention will be to rationalise the toolset.

Powerlink's Data Strategy will play a key role in upholding the quality of data sources that are critical to BI delivery.

2.2.1. Option 2 Assumptions

Option 2 has been estimated based on the following assumptions.

Construction Cost and Scope Assumptions

- The project costs are based on a build-up of forecast resourcing, vendor & specialist services, as well as software licensing costs as detailed in the table below.

[redacted]

Table 3: Option 2 Cost Build-Up (2021/22 $ real)

- This estimate is based on standard unit rates with estimates based on previous projects of similar size and complexity.
- The project is planned to run across a 24 month timeframe, inclusive of 9 month combined procurement and design phases. The delivery phase is forecast at 12 months, concluding with 3 months of hypercare.
- Available solutions will be available to meet Powerlink's payroll system scope.
- Ongoing IT Operating costs are expected to be similar to current costs, therefore current costs have been used in estimating future costs
- Lifecycle maintenance of existing hardware, operating system and database management systems will occur as part of other funded initiatives
- The final business case development process will be used to refine the scope, costs and impacts for this investment. A procurement activity will be undertaken to inform costs and solution options

Operating Cost Assumptions

- IT operating costs are forecast to remain constant with rationalisation gains offsetting the license and support increases.

Other Assumptions (Non Financial)

- The Data Strategy initiative will define the capabilities required in managing Information, Analytics and Insights.

2.2.2.Option 2 Benefits

The following benefits may be achieved with selection of this Option 2.

Benefit Description	Financial Value ($M Real 2021/22 p.a.)
B1. Improved Systems interoperability As Powerlink continues to develop its data driven fact-based decision capability, demand for systems integration is expected to continue to grow. Increased levels of interoperability will be required as data quality and completeness related to assets and their performance improves. Benefits of improving interoperability include: • Building trust in our datasets by leveraging the appropriate single source of truth that is reliable and secure. • Improving the timing and accuracy of our data. • Creating feedback loops that improve quality, context and the depth of data over time.	N/A (Non-Financial)
B2. Application rationalisation New systems are typically more capable and as such may offer opportunities for rationalisation reducing complexity and enabling Powerlink to focus skills development and support on fewer systems. Reducing the number of data warehouses will simplify the BI functions related to building, maintaining and interrogating data. Examining the capability of all tools when reviews occur may expose opportunities to leverage new features in one tool that enable an existing tool providing those services to be decommissioned.	N/A (Non-Financial)
B3. More meaningful insights It is anticipated that the combination of improved interoperability with a wider variety of data sources and new technology will provide more meaningful insights to the business. With regard to assets, more meaningful or even new insights may deliver benefits in the way Powerlink manages its maintenance schedules. This may lead to a possible reduction in the amount and frequency of maintenance necessary to maintain equipment and plant at safe levels. Better insights into feeder corridor maintenance may also lead to reduced levels of vegetation management. Any reductions in maintenance costs contribute to Powerlink's productivity targets. The insights also lead to benefits for the maintenance of the data warehouses though: • Improving the timing and accuracy of our data. • Establishing consistency and improving interpretability. • Creating feedback loops that improve quality, context and the depth of data over time.	Contributes to Powerlink's productivity improvement

B4. Prudent leverage of industry advances New systems are typically more capable, and this is particularly true in the BI space that has seen renewed interest as a result of global growth in emerging technologies. As a result, Powerlink considers this cyclic renewal as an opportunity to maintain accessibility and supportability while advancing BI capability by leveraging progress from the wider industry leading to innovative ways to interrogate data and drive more informed decisions for the management of assets.	N/A (Non-Financial)
B5. Process improvement efficiencies New systems will apply a unique lens to process improvement and optimisation efforts and are therefore expected to uncover new optimisation opportunities.	Contributes to Powerlink's productivity improvement

Table 8 - Option 2 Benefits

2.2.3. Risk Mitigation

Listed below is a summary of how this option addresses risks identified through the base case. The opening risk position represents the risk level at the end of the coming 2023-27 regulatory period should the base case have been selected. .

Risk Description	Inherent risk 2027	Nature of Mitigation	Mitigation through this Option
R1 – Business operational impact Loss of access to BI data and toolsets due to system failure or data corruption, coupled with ineffective business workarounds and limited ability to progress any major updates/upgrades. **Risk categories – (Workplace Health and Safety Compliance, Market Obligations, Regulatory reporting, Security)**	**Moderate**	Cyclic renewal and rationalisation of the BI tools will ensure the tools remain supported and outages avoided. A reduction in the number of tools and data warehouses simplifies the overall BI solution removing several pits of failure. **(Very Rare, Minor)**	**Low**
R2 - Business operational impact Ineffective BI toolsets leads to business units not being able to support decisions with data. **Risk categories – Business Operations**	**Moderate**	Cyclic renewal of tools will ensure contemporary features of the tools are available for use. Coupled with extensions to interoperability Powerlink will be better placed to meet BI requirements across the business. **(Very Rare, Minor)**	**Low**
R3 – Cybersecurity With the inability to progress major systems updates/upgrades, including access control/security updates, and the growing sophistication of cybersecurity attacks, there is increasing potential for: • undetected data corruption or manipulation • disclosure of stakeholder information or sensitive documents to unauthorised users. **Risk categories – Security**	**Significant**	Cyclic renewal and rationalisation of the BI tools will ensure the tools remain supported and the cyber security posture meets Powerlink's requirements. **(Rare, Moderate)**	**Moderate**

Table 9 – Risk Mitigation

Figure 3 - Option 2 - Summarised Risk Profile below summarises the risk position of adopting the base case (assessment of each risk tabled above).

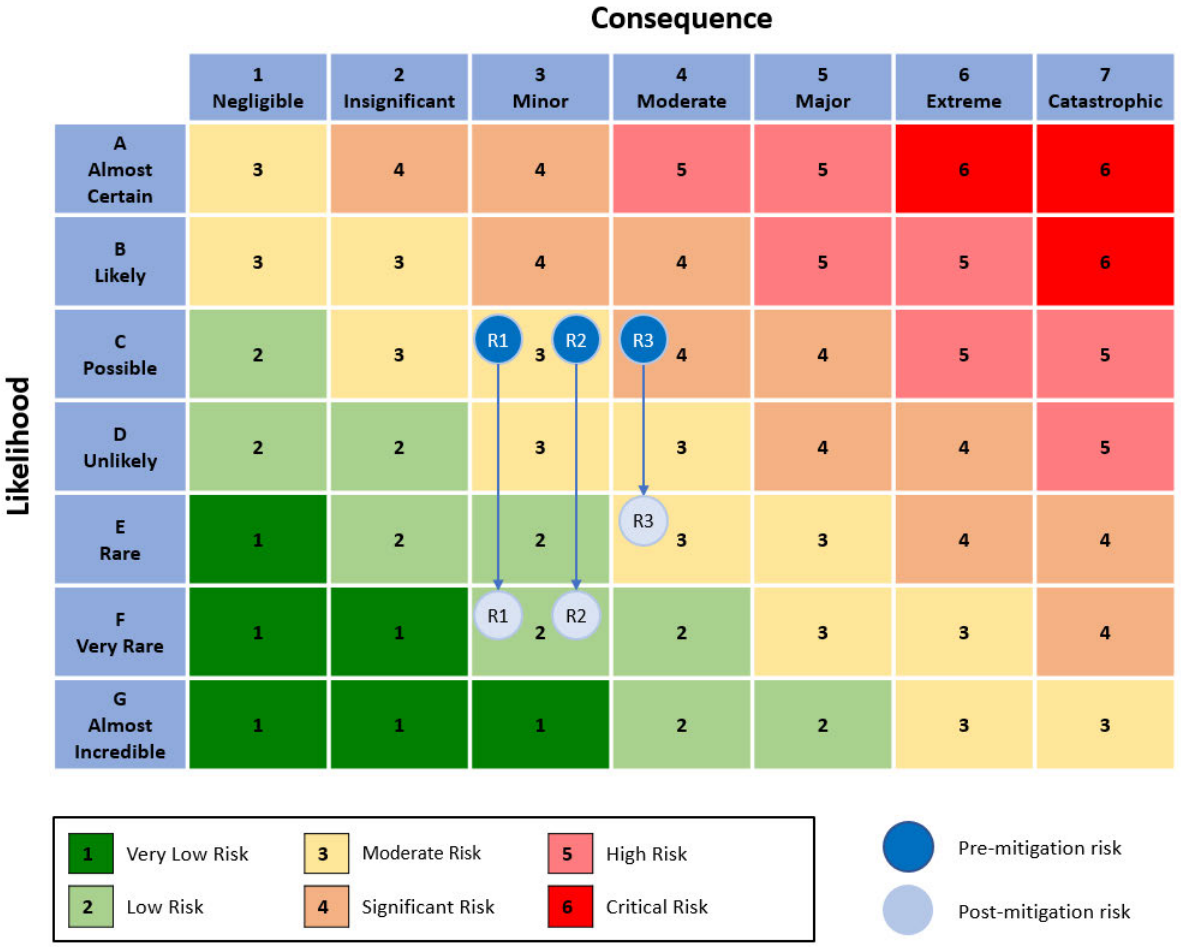

Figure 3 - Option 2 - Summarised Risk Profile

2.3. Option 3: Replace the BI Application Portfolio and move to contemporary platforms

Industry advances in the BI, AA, AI and ML arenas potentially offer significant innovation options to Powerlink, especially in terms of next-generation insights and decision support. Industry developments also point to the likelihood of cloud offerings playing an increasing role in the provisioning of BI capabilities. Emerging Cloud BI solutions may offer the opportunity to leverage de-identified data from other industry participants, in particular asset performance data for assets classes used by other participants and Powerlink.

In line with this context, option 3 proposes to test the market for contemporary solutions with a view to replace the current suite of BI systems with systems that favour and leverage emerging technologies.

This option carries the potential for significant reward but also increases risk of business disruption and service delivery as a result of the scope and complexity associated with a wholesale replacement of systems. Powerlink's skill base and stakeholder engagement models would also need to be revised.

2.3.1. Option 3 Assumptions

This option has been estimated on the basis of the following assumptions.

Construction Cost and Scope Assumptions

- The project costs are based on the Option 2 build-up of forecast resourcing, vendor & specialist services, as well as software licensing costs (page 11), but with increased planning and design to reflect the additional effort associated with planning and implementing a new system that needs to be highly integrated.
- This preliminary estimate has been formulated using a combination of standard unit rates for Powerlink internal and external resourcing across the proposed timeline, leveraging current and previous analytics projects for vendor estimates.
- The program of system replacements is planned to run across an extended 24 month timeframe.
- The final business case development process will be used to refine the final scope, costs and impacts for this investment. One or more procurement activities will likely be undertaken to further inform costs and solution options.

Other Assumptions (Non-Financial)

- Business areas may be impacted multiple times through the progressive delivery of replacement systems.
- Powerlink's will need to update its internal skill base in order to effectively operate a range of new systems.

2.3.2. Option 3 Benefits

The following benefits may be achieved with selection of this option. Financial benefits are identified as "per annum" ongoing savings where relevant and will begin accruing following implementation of the option.

The potential range of benefits matches those of Option 2, along with benefits from the extra initiatives and system replacements. There is a risk to the delivery of the benefits due to the large business change across the enterprise limiting the ability to capitalise on all new capabilities in the short term.

Benefit Description	Financial Value ($M Real 2021/22 p.a.)
B1. Insights Powerlink's core corporate system functions and processes may receive powerful insights from AI driven expert systems and similar emerging technologies. Potential areas to benefit include demand and energy forecasting and asset management.	N/A (Non-Financial)
B2. Process improvement efficiencies New systems will apply a unique lens to process improvement and optimisation efforts and are therefore expected to uncover new optimisation opportunities.	Contributes to Powerlink's productivity improvement

Table 10 - Option 3 Benefits

2.3.3.Risk Mitigation

Listed below is a summary of how this option addresses risks identified through the base case. The opening risk position represents the risk level at the end of the coming 2023-27 period should the base case have been selected.

Risk Description	Inherent risk 2027	Nature of Mitigation	Mitigation through this Option
R1 – Business operational impact Loss of access to BI data and toolsets due to system failure or data corruption, coupled with ineffective business workarounds and limited ability to progress any major updates/upgrades. **Risk categories – (Workplace Health and Safety Compliance, Market Obligations, Regulatory reporting, Security)**	**Moderate**	Cyclic renewal and rationalisation of the BI tools will ensure the tools remain supported and outages avoided. A reduction in the number of tools and data warehouses simplifies the overall BI solution removing several pits of failure. **(Very Rare, Minor)**	**Low**
R2 - Business operational impact Ineffective BI toolsets leads to business units not being able to support decisions with data. **Risk categories – Business Operations**	**Moderate**	Cyclic renewal of tools will ensure contemporary features of the tools are available for use. Coupled with extensions to interoperability Powerlink will be better placed to meet BI requirements across the business. **(Very Rare, Minor)**	**Low**
R3 – Cybersecurity With the inability to progress major systems updates/upgrades, including access control/security updates, and the growing sophistication of cybersecurity attacks, there is increasing potential for: • undetected data corruption or manipulation • disclosure of stakeholder information or sensitive documents to unauthorised users. **Risk categories – Security**	**Significant**	Cyclic renewal and rationalisation of the BI tools will ensure the tools remain supported and the cyber security posture meets Powerlink's requirements. **(Rare, Moderate)**	**Moderate**

Table 11 - Option 3 - Summarised Risk Profile

Figure 4 - Option 3 - Summarised Risk Profile below summarises the risk position of adopting the base case (assessment of each risk tabled above).

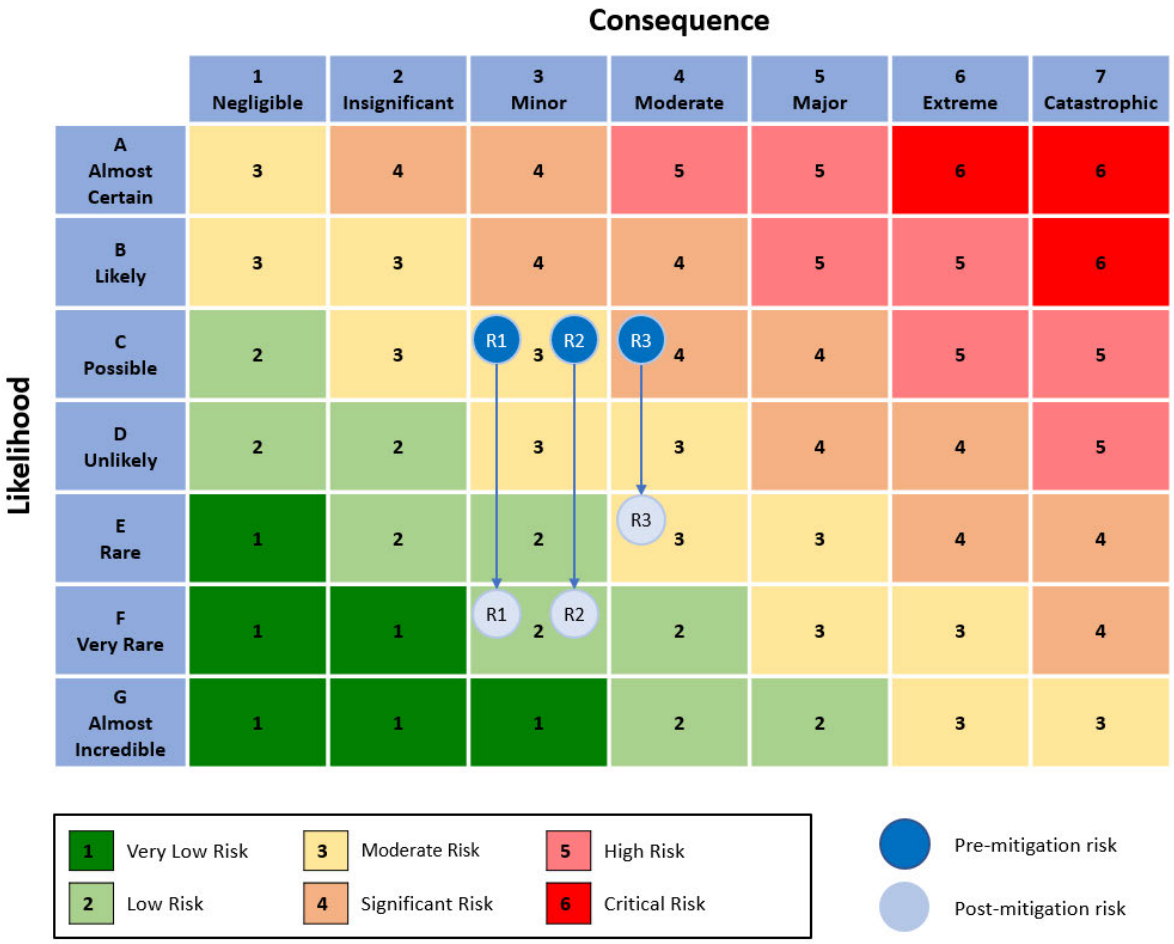

Figure 4 - Option 3 - Summarised Risk Profile

2.4. Option Financial Comparison

Table 12 - Option NPV Financial Comparison (below) provides a summary comparison of the identified options.

Option	Title	NPV	Counterfactual Difference	Result
Option 1	Base Case (Counterfactual) Retain existing systems and defer replacement	(3,176,340)	-	
Option 2	Leverage the cyclic renewal to rationalise the Application Portfolio(Recommended)	(2,982,435)	**193,905**	**Least Cost**
Option 3	Replace the BI Application Portfolio and move to contemporary platforms	(3,314,974)	(138,634)	

Table 12 - Option NPV Financial Comparison

Consistent with the above analysis, Option 2 "Leverage the cyclic renewal to rationalise the Application Portfolio" is recommended.

2.5. Cashflow Summary

Table 13 (below) provides a summary of forecast cashflow over the 10 year analysis period for the recommended option (i.e. Option 2).

[redacted]

Table 4: Cashflow Summary (Recommended Option)

3. RECOMMENDATION

3.1. Recommended Solution

"**Option 2 Cyclic Renewal of BI Applications leveraging the opportunity to Rationalise the BI Application Portfolio**". This option represents the prudent replacement of core systems capability, ensuring ongoing sustainability and support for broader improvement in business decision making, consistent with reducing risk and optimising costs.

Option 3 Replace the Application Portfolio and move to contemporary platforms would deliver new and better solutions for BI, AI, ML and self-service but due to the still emerging nature of these technologies (particularly cloud based solutions) it is difficult to determine what capabilities may be available and therefore quantify the benefits. For this reason Option 2 is considered more likely to deliver benefits and be successful in delivery.

Delivery of the recommended option will begin in FY23/24.

Total forecast non-network (IT) expenditure for the recommended option within the 2023-27 regulatory control period is [redacted] capex and [redacted] opex (FY21/22 real terms) with a 10 year NPV benefit of $0.15 million relative to the base case counterfactual.

3.2. High Level Timeline

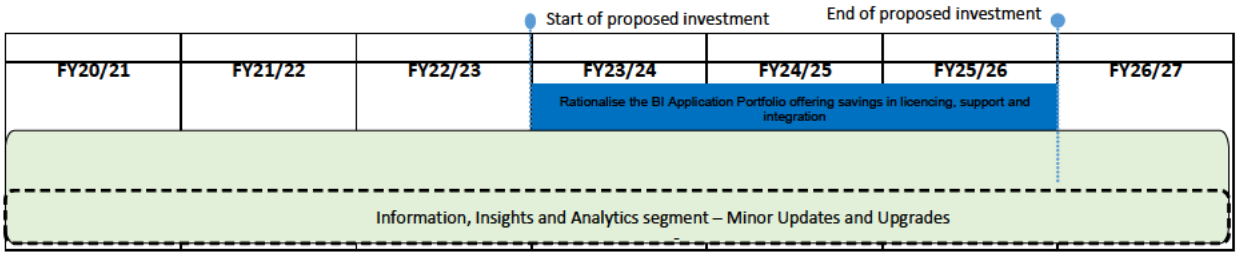

Figure 5 - High level Investment Timeline

3.3. Initiative Value Assessment

Figure 6 (below) summarises the planned initiative value across parameters of:

A: Strategic Alignment and Value
B: Ease of Business Change
C: Architecture Alignment
D: Ease of Delivery and Operation

As indicated in the figure, the planned investment is at or approaching the 75th percentile in assessment against parameters B, C and D. The investment scores lower against parameter A.

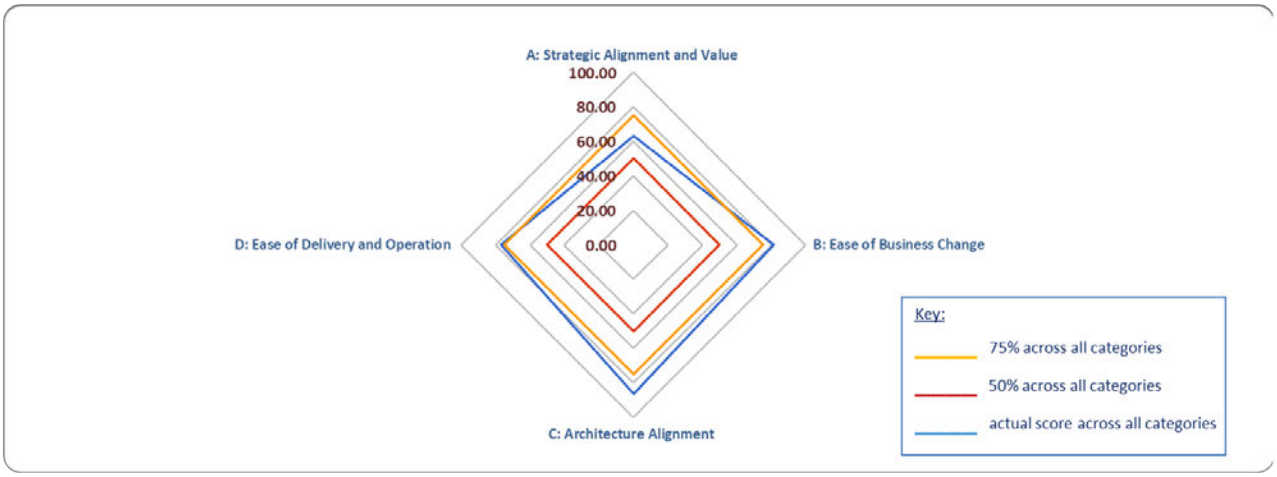

Figure 6 – Initiative Value Assessment

4. SUPPORTING DETAIL

4.1. Program Delivery Risks

Key risks associated with delivery of the program.

Risk #	Risk Category	Description	Inherent Risk Level	Mitigation Plan	Residual Risk Level
01	Key Resources	This initiative is dependent on the knowledge and expertise of Powerlink's personnel including (but not limited to): • Architects • Stakeholder Management and Engagement • IT specialists These resources also have business as usual (BAU) responsibilities.	Moderate	**Accept and Mitigate:** The project will be delivered through a combination of internal and external resourcing, with budgetary capacity to enable backfilling of key roles where required. The project and line-managers also have a responsibility to identify potential constrains and manage potential fatigue. This initiative is renewing Powerlink's BI systems, which are core to the decision making process for Powerlink. It is therefore important to allocate the company's most capable staff wherever practical and apply appropriate resource retention strategies.	Low
02	Environment	This initiative is key to improving Powerlink's drive for data driven fact-based decisions. Powerlink's data footprint is extensive and complex in a BI field that is growing and evolving rapidly. Scope creep is therefore a heightened risk due to the nature of the environment the program is operating in.	Moderate	**Accept and Mitigate:** The project will be delivered under Powerlink's project delivery and change management methodologies. Powerlink will also govern its data environment thorough Data Governance and Enterprise Architecture working groups.	Low

Table 54 – Information, Analytics and Insights Program Delivery Key Risks

4.2. Program Constraints

Key constraints associated with delivery of the program.

#	Type	Description
01	Schedule	The program is undertaking a rationalisation of the BI portfolio and planned for completed by June 2026 to ensure efficient, reliable and supportable systems capability underpinning Powerlink's production IT environment.
02	Financial	The financial estimate for this initiative has been based on historic expenditure, standard unit rates, market interactions and the knowledge of internal subject matter experts. Endorsement of this investment case does not constitute approval for expenditure. A more detailed investment case will be developed consistent with Powerlink's investment governance processes to confirm the final initiative scope and budget. The investment case will require endorsement by the Powerlink Executive Committee - Digital Technology.
03	Workforce Impact and Change Management	Information, analytics and Insights services are used throughout the organisation, and as such, the program incorporates close involvement of the BAU teams and business leaders. The program will consult on required work practice changes and employ contemporary training methods and change management techniques to minimise the impact of the workforce.

Table 65 - Information, Analytics and Insights Program Constraints

4.3. Program Assumptions

The following assumptions are relevant to all investment options.

#	Type	Description
01	Resourcing	Powerlink internal resources allocated to the program will remain available to the program as planned. The program will supplement internal resourcing with external service provision, including services provided by solution vendor(s), non-vendor specialist service providers and experienced contract resourcing.
02	Commitment	Program resources (internal and external) have the commitment, drive and capability to deliver agreed work products to agreed plans.
03	Priority	Through the life of the program, Powerlink and our stakeholders will continue to prioritise the need for investment in technology applications consistent with the "Investment Need" described in section **Error! Reference source not found.** of this document.
04	Scope	This program seeks to undertake a rationalisation Powerlink's BI platforms in line with Powerlink's objective for data driven fact-based decisions. Through targeted renewal this program will provide efficient, sustainable and secure systems capability to support BI. This renewal is consistent with established IT asset lifecycle management principles. The scope covers the systems support this capability as outlined in section **Error! Reference source not found.**.

Table 76 - Information, Analytics and Insights Program Assumptions

4.4. Business Area Impacts

Key business area impacts.

#	Impacted Group	Description
01	Powerlink Executive Leadership Team	• Require awareness of the planned investment goals and to provide ongoing oversight of the program, with direct governance duly delegated to the Program Board. • Provide leadership and serve as role models in the rollout of new BI initiatives championing the newly implemented capabilities and subsequent trust in the data.
02	BI users	• Will be the subject of requirements gathering, testing and change management activities
03	IT and OT Workgroups	• Contribute to the planned deployment of BI solutions, related business process changes and change management activities and to optimise coordination with other planned projects and programs as well as planned software and hardware renewals.

Table 87 - Information, Analytics and Insights Business Area Impacts

5. Appendix A: Glossary of Terms

The following terms or abbreviations are used within this document.

Term	Definition
AEMC	The Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AA	Augmented Analytics
AI	Artificial Intelligence
BI	Business Intelligence
BIDW	BI Data Warehouse – SAP based data warehouse
Capex	Capital Expenditure
EDW	Enterprise Data Warehouse- Non SAP based data warehouse
IT	Information Technology
ML	Machine Learning
NPV	Net Present Value
Opex	Operating Expenditure
OT	Operational Technology
PQ	Powerlink Queensland
TNSP	Transmission Network Service Provider
TRA	Threat Risk Assessment