

31 January 2023

Attachment 5.9.f: Data & analytics program

Ausgrid's 2024-29 Regulatory Proposal

Empowering communities for a resilient, affordable and net-zero future.





Table of Contents

1.	Document governance	4
1.1.	Purpose of this document	4
Relate	ed documents	4
Docun	nent history	4
Appro	val(s)	4
2.	Executive summary	5
3.	CONTEXT	7
3.1.	Background	7
3.1.1.	Introduction	7
3.1.2.	Recent investments	8
3.2.	Problem / opportunity	8
3.3.	Investment objectives	9
3.4.	Customer outcomes	10
3.5.	Compliance requirements	11
4.	OPTIONS	13
4.1.	OVERVIEW OF OPTIONS	13
4.2.	OPTION 1: Base Case (Counterfactual)	13
4.2.1.	Description	13
4.2.2.	Option 1 assumptions	14
4.3	OPTION 2: Enhance Date and Analytics conshility (Proferred)	14
	OF HON 2. Enhance Data and Analytics capability (Freiened)	• •
4.3.1.	Description	14
4.3.1. 4.3.2.	Description	14 15
4.3.1. 4.3.2. 4.3.3.	Description Option 2 assumptions Option 2 costs	14 15 16
4.3.1. 4.3.2. 4.3.3. 4.3.4.	Description Option 2 assumptions Option 2 costs NPV analysis	14 15 16 17
4.3.1. 4.3.2. 4.3.3. 4.3.4. 4.4.	Description Option 2 assumptions Option 2 costs NPV analysis Alternative Options	14 15 16 17 18
4.3.1. 4.3.2. 4.3.3. 4.3.4. 4.4. 4.5.	Description Option 2 assumptions Option 2 costs NPV analysis Alternative Options Approach to Costing	14 15 16 17 18 19
4.3.1. 4.3.2. 4.3.3. 4.3.4. 4.4. 4.5. 5.	Description Option 2 assumptions Option 2 costs NPV analysis Alternative Options Approach to Costing RECOMMENDATION	14 15 16 17 18 19 20
4.3.1. 4.3.2. 4.3.3. 4.3.4. 4.4. 4.5. 5. 5.1.	Description Option 2 assumptions Option 2 costs NPV analysis Alternative Options Approach to Costing RECOMMENDATION Recommended solution	14 15 16 17 18 19 20 20
4.3.1. 4.3.2. 4.3.3. 4.3.4. 4.4. 4.5. 5. 5.1. 5.1.1.	Description Option 2 assumptions Option 2 costs NPV analysis Alternative Options Approach to Costing RECOMMENDATION Program delivery risks	14 15 16 17 18 19 20 20 20
4.3.1. 4.3.2. 4.3.3. 4.3.4. 4.4. 4.5. 5. 5.1. 5.1.1. 5.1.2.	Description Option 2 assumptions Option 2 costs NPV analysis Alternative Options Approach to Costing RECOMMENDATION Recommended solution Program delivery risks Program assumptions	14 15 16 17 18 19 20 20 20 20 21
4.3.1. 4.3.2. 4.3.3. 4.3.4. 4.4. 4.5. 5.1. 5.1.1. 5.1.2. 5.1.3.	Description	14 15 16 17 18 19 20 20 20 21 21
4.3.1. 4.3.2. 4.3.3. 4.3.4. 4.4. 4.5. 5.1. 5.1.1. 5.1.2. 5.1.3. 5.1.4.	Description Option 2 assumptions Option 2 costs NPV analysis Alternative Options Approach to Costing RECOMMENDATION Recommended solution Program delivery risks Program dependencies Business area impacts	14 15 16 17 18 19 20 20 20 21 21 21 22
4.3.1. 4.3.2. 4.3.3. 4.3.4. 4.4. 4.5. 5.1. 5.1.1. 5.1.2. 5.1.3. 5.1.4. 6.	Description Option 2 assumptions Option 2 costs NPV analysis Alternative Options Approach to Costing RECOMMENDATION Recommended solution Program delivery risks Program delivery risks Program dependencies Business area impacts	14 15 16 17 18 19 20 20 20 21 21 21 22 23



Appendix 1 Big Insights Platform	25
Appendix 2 Data and Analytics and links to other program briefs	
Appendix 3 Risk Assessment – Option 1	27
Appendix 4 Risk Assessment – Option 2	



1. Document governance

1.1. Purpose of this document

The purpose of this document is to outline the program brief for the proposed data and analytics program of work that will form part of our 2024-29 regulatory proposal.

Related documents

Document	Version	Author
Attachment 5.9 - Technology Plan	V2.1	ICT Manager
Attachment 5.9.I - Data & Analytics - CBA model	V1.0	ICT Manager
Consolidated Cost Model	V18	ICT Manager
2022-29 Technology Strategy	V1.0	CIO
2022-35 Corporate Strategy	V1.0	Head Of Strategy

Document history

Date	Version	Comment	Person
10/02/2022	V0.1	Initial Draft	Matthew Erikson
24/03/2022	V0.2	ICT and Business review	Matthew Erikson
16/05/2022	V1.1	CIO Feedback	Matthew Erikson
26/05/2022	V1.2	Independent Review	Matthew Erikson
31/10/2022	V1.3	CIO Final Review	Ryan Hewlett

Approval(s)

Name	Position	Date
CIO	Chief Information Officer	31/10/2022
CFO	Chief Financial Officer	30/11/2022



2. Executive summary

The table below provides a summary of the Data and Analytics program detailed in this program brief. The program of work forms part of our 2024-29 regulatory proposal. If approved, the program would require an investment of \$30.3 million and would deliver a net present value (**NPV**) of \$42.7 million.

Executive summa	ary
Key Objective(s) of the program	 Enables Ausgrid to move to a flexible, decentralised system that is underpinned by rich, local and accessible data; Providing data in the right channels and format to empower customers and service partners to enable economic decision making across the energy ecosystem; Enhance our data and analytics capabilities in a sustainable manner to help meet the changing needs of the community and to drive further value from the future grid; Enables Ausgrid to improve operational efficiency, and improve safety outcomes for customers by enabling: Automated collection, storage, and analysis of high volumes of data; Faster and more accurate communication with customers; Optimised, risk-based asset management; Smart network planning and network visibility; End-to-end digitally enabled works in field operations; and Use of digital tools to improve employee experience and free up time to solve new problems.
Customer benefits	 Applying analytics to the vast amounts of useful data that Ausgrid collects, offers an opportunity for: Faster connections processes and improved safety through automated collection, storage, and analysis of high volumes of data; Leveraging real time analytics capability such as dynamic pricing and billing will enable customers wanting to easily participate in the future Consumer Energy Resources (CER) network seamlessly; Faster and more accurate outage information communicated to customers; Fewer outages due to predictive analytics and faster crew response times leading to fewer service disruptions; More informed decision making, particularly for life support customers, with integration of customer and network data; and Improved customer safety outcomes given the more accurate and more proactive modelling of climate impacts allowing better prevention when these events occur.
Regulatory requirements	 Security of Critical Infrastructure Act 2018 (SOCI), Security Legislation Amendment (Critical Infrastructure) Act 2021 (SLACI) and Security Legislation Amendment (Critical Infrastructure Protection) Act 2022 (SLACIP) – Requires Data and Analytics capabilities to be kept up to date, supported and secured as a key enabler to comply with this Act. Privacy Act 1988, Information Privacy Act 2014 - Having up-to-date and supported Data and Analytics capabilities as a key enabler to



	 appropriately securing information and reducing the risk of a data breach. Electricity Supply Act 1995 New South Wales (NSW) – Requires supporting Data and Analytics capabilities to be highly available and secure enables our critical business services to meet obligations in this Act. National Electricity Law (NEL) and National Electricity Rules (NER) - Requires supporting Data and Analytics capabilities to be highly available and secure enables our critical business services to meet obligations in this Act. National Electricity Law (NEL) and National Electricity Rules (NER) - Requires supporting Data and Analytics capabilities to be highly available and secure enables our critical business services to meet these Rules. 						
NPV calculations	Total: \$42.7 milli	ion					
Program	Program duratio	n	5 years	S			
timings	Program start ye	ear	2024	Q1	Q2	Q3	Q4
Expenditure	\$ million	FY25	FY26	FY27	FY28	FY29	Total ¹
TOTECAST	САРЕХ	(10.4)	(10.9)	(5.9)	(1.5)	(1.5)	(30.3)
	OPEX	-	-	-	-	-	-
	SCS ²	(10.4)	(10.9)	(5.9)	(1.5)	(1.5)	(30.3)
	Ongoing new opex	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.5)
Program type	ICT investment	⊠ Yes			🗌 No		
	Recurrent ICT					⊠ No or n/a	
	Non-recurrent IC	т	Yes 🗌 No d		🗌 No o	r n/a	
	One-off SaaS opex				r n/a		

Due to rounding, some totals may not correspond with the sum of the separate figures.
 Cost allocation method (CAM) allocated standard control services (SCS) component.



3. CONTEXT

3.1. Background

3.1.1. Introduction

Today, organisations seek to differentiate through their platforms and data. Data driven organisations expose data to collaborate with trusted partners securely, extract insights through analytics, Machine Learning (**ML**) and Artificial Intelligence (**AI**) and automate processes to improve customer experience and efficiency.

The amount of data flowing through our organisation continues to grow each year. Smart meters and devices, as well as other assets deployed across the network are creating larger and richer data sources and data sets. In addition, the associated data underpinning regulatory compliance analytics and reporting is becoming more complex. While the scale of captured data is continuing to grow, so is the need to facilitate greater access to it and the provision of accurate information to customers and across the business. Recent changes to the market that highlight this growth include:

- Growth in CER increasing growth in CER and the need for Distribution Network Service Providers (DNSP) to be able to facilitate greater access to data for customers to optimise the use of existing and future CER;
- 5-minute settlement changes to the financial settlement period for the wholesale electricity market from 30 minutes to 5 minutes. This has increased the volume and quantity of data we are required to capture store and process; and
- New customers we are anticipating significant growth in our solar photovoltaic (PV) and battery customers in this current regulatory control period, with growth in this customer base expected to be around 52% by the end of the period. In the upcoming 2024-29 regulatory control period we are anticipating this growth to continue at 4% per annum.

Investment in our data and analytics capabilities is ongoing. In the period 2019-24, we proposed investment in a Data and Digital Enablement Program to provide better intelligence from data to meet changing customer expectations of faster response times and access to real time data. We also proposed to move more of our supporting data and analytics systems to the cloud.³ We are on track to deliver these capabilities having introduced a Big Insights Platform (**BIP**) and started the process of moving more of our technology to the cloud.

The BIP provides a centralised repository of trusted data across the enterprise for management and operational reporting. The repository is for raw data (structured and unstructured) to be leveraged for advanced analytics, data ingestion⁴, storage, modelling, reporting, analytics and data science. More information on our current capabilities in relation to data gathering, integration and organisation and what is needed to transform and extract value from our data is provided in Appendix 1 – Big Insights Platform.

To build on our current capability in a sustainable manner during the current regulatory control period we planned to:

 Develop a well-governed foundation of data sets across asset, customer and other key areas of the business to serve as a trusted base for ongoing operations and new business initiatives. This supports each of the domain areas above by limiting errors in operations, reducing time-to-market for new initiatives, and ensuring that both customers and we can rely on information provided and used by the organisation.

³ Ausgrid's Regulatory Proposal 2019–2024, p. 99.

⁴ Data ingestion refers importing data into a system for the purpose of use, data analytics and / or storage.



2. Develop an enterprise data lake⁵ capability as a central source of the truth for all enterprise data sets.

3.1.2. Recent investments

A cloud-based data platform was established in a limited capacity in 2019 to enable us to develop some initial use cases for productivity enhancements. This included the consolidation of metering data - reducing IT risk and improving time to market of reporting enhancements for the metering data set. This also included the establishment of Network Tariff analytics which improved our ability to set network tariff pricing and customers to access more cost reflective pricing.

In 2022, we began the process of expanding our investment in the existing platform. The build out of our data platform specifically targeted legacy data warehouse technologies. We also established our Data Governance Strategy. This strategy allows Ausgrid to build our data and analytics capacity in a sustainable manner and focusing on where we can deliver the most value to the business and customers.

3.2. Problem / opportunity

The effective operation of our business and the quality of the services we provide our customers are underpinned by data. However, the current data and technology landscape does not support the anticipated data growth and data processing which will be required to meet the needs of the business into the future. Our data is of significant value and a core asset to our business. Without the integration of data, our ability to unlock future value and enable future business needs such as analytics in support of CER is limited.

We currently manage multiple tools and technologies in support of our analytics and business insights, resulting in complexity and cost. Our current data landscape includes:

- Over 400 applications;
- Data volumes that have grown by more than 1,200% since 2018;
- Analytical capabilities that are unlikely to support the efficient adoption of emerging technologies; and
- Poor timeliness and availability of data about electrical network outage remediation to communicate to customers

Reporting from individual applications often provides an incomplete picture – for example, asset data is held in the SAP Enterprise Resource Planning (**ERP**) system, but metering data is a separate system. Having to access data manually from multiple systems, increases the need for data validation and means that insights and analysis are more costly and time consuming to obtain. Aggregating these will allow us to gain greater insights of how electricity consumption at different meter locations can affect the health of various models of electricity meter hardware, leading to more prudent purchasing decisions in the longer term.

While improvements have been made in the current regulatory period to improve our ability to import, analyse and report data, market changes and opportunities to improve business efficiencies require further investment to enable Ausgrid to maintain an efficient business and meet the needs of our customers. The investments in the 2024-29 regulatory control period include a plan to:

1. **Develop and enhance the analytics use-cases**. These are specific initiatives for how the data may be used, such as for developing sophisticated data modelling using asset condition monitoring, weather, maintenance history and financial data to develop a

⁵ A data lake is a centralised repository that allows you to store all your structured and unstructured data at any scale.



replacement expenditure plan that enables network resilience while maintaining maximum affordability for customers.

In addition, there are use cases that will provide benefits across Ausgrid in customer, people, procurement, finance and operational teams. These benefits will drive efficiencies and improve insights across the business and will increase as the number of data sets held within the BIP grows.

 Provide access to scalable infrastructure, Application Programming Interface (API) technology⁶, and advanced data analytics techniques to support our adoption of emerging technology. Our vision to be a distribution system operator (DSO), and our ambition to leverage CER, requires an uplift in the volume, exchange frequency, security posture and analytical capability of data.⁷

Appendix 2 - Data and Analytics and links to other program briefs provides detail on how our Data and Analytics Program enables other ICT systems and strategic investments.

Figure 1 - How the Data & Analytics Program Brief supports the Technology Strategy demonstrates the data capabilities and embedded activities that allows Ausgrid to deliver value and benefits to both Customers and the business.



Figure 1 How the Data & Analytics Program Brief supports the Technology Strategy

3.3. Investment objectives

Under the proposed program of work, we are aiming to achieve the following objectives:

- Automated collection, storage and analysis of high volumes of data to enable outcomes such as faster connections processes and improved safety;
- Enable customers to participate in the future CER network;
- Faster and more accurate communication of outage information to customers via improved outage remediation status tracking and work coordination;
- Optimised, risk-based asset management using Adaptive-Additive (AA) algorithms;

⁶ API is a software intermediary that allows two applications to interact to each other

⁷ DSO Vision Statement



- Smart network planning with High Voltage (**HV**) to Low Voltage (**LV**) visibility of network investment needs and drivers;
- End-to-end digitally enabled works in field operations with delivery process supported by modern data capture technologies;
- Best-in-class operations centre with full visibility of network status and remote operational capabilities; and
- Use of digital tools to improve employee experience and free up time to solve new problems.

Achieving these objectives will position us, by the end of 2024-29 regulatory control period, to be able to:

- 1. Leverage a well-governed foundation of data sets across asset, customer and other key areas of the business to serve as a trusted base for ongoing operations and new business initiatives; and
- 2. Uplift the volume, exchange frequency, security posture and analytical capability of data to meet future needs and improve operational efficiency.

3.4. Customer outcomes

Our Corporate Strategy 2022-35 has identified four key topics that will define our business into the future. Of these, the Data and Analytics Program is aligned to Value People and Optimised Assets and Operations as detailed below.

 Valued People Harness our knowledge and resources to work safely and efficiently Be inclusive, capable and informed with our diverse, trusted workforce Employee engagement Female people leaders 	Objectives	Actions	Measures		
Enable our people to work smarter by simplifying processes and systems	Valued People Put our people at the heart to make Ausgrid a great place to work	 Harness our knowledge and resources to work safely and efficiently Be inclusive, capable and informed with our diverse, trusted workforce Enable our people to work smarter by simplifying processes and systems 	 Zero fatalities Total Recordable Injury Frequency Rate (TRIFR) Employee engagement Female people leaders 		
 Collaborate and support each other 		Collaborate and support each other			
Optimised Assets & OperationsImprove operational efficiency Lift our digital and data capabilities to make fast, evidence-based decisionsStandard Control Services (SCS) opexExcel at operations to deliver safe and affordable servicesEnhance effectiveness of internal servicesDelivery of network CAPEX programGrow revenue by leasing our assets	Optimised Assets & Operations Excel at operations to deliver safe and affordable services	 Improve operational efficiency Lift our digital and data capabilities to make fast, evidence-based decisions Enhance effectiveness of internal services Grow revenue by leasing our assets 	 Standard Control Services (SCS) opex Delivery of network CAPEX program 		

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• Valued People:

- An investment in data and analytics aligns with resilience in maintaining safety, reliability, and network security by:
- Ensuring data and analytics tools enable our BIP to meet current and future needs.
- Enables systems to be supported and sustainable to meet our current and future needs.
- Supports efficiencies and information accuracy through:
 - Automation of data collection from information sources and network assets;
 - Implementation of automated data quality checks;
 - Further maturing and support for data governance; and
 - Higher data quality standards and speedier analytics translate directly to higher standards in safety, lower operational costs and better, more proactive, communication with customers.

• Optimised Assets & Operations:

- All initiatives in the Information, Communications and Technology (ICT) CER program will require investment in data and analytics to enable us to leverage the advantages of assets such as community batteries, micro-grids, solar or customer-facing apps like Switched. This will be enabled through data and analytics by:
 - Having high quality data models of the electrical network, pricing, customers and assets;
 - Having the scalability of a cloud data platform to support the volume and number of integration points; and
 - A continually improving regime of analytic development to continually identify areas of opportunity, improve customer outcomes and drive efficiency across the business.

3.5. Compliance requirements

The proposed program of works supports meeting our compliance and regulatory obligations. The obligations, along with a brief description of the requirement, are detailed below.

Obligation	Description of Requirement
National Electricity Rules	The operating and capital expenditure objectives ⁸ set out in the NER require us to maintain both the quality, reliability, and security of supply of standard control services and the reliability and security of the distribution network.
	Ensuring that we have efficient data and analytics capabilities is a key enabler to having better visibility of our compliance with these rules.
Privacy Act 1988 & Information Privacy Act 2014	The State Records Act 1998 (NSW) directs that all organisation records are stored in a way that makes sure the organisation meets its legislative and regulatory requirements. Under Section 11(1) of the State Records Act "each public office must ensure the safe custody and proper preservation of the State records that it has control of".

⁸ See clauses 6.5.6(a) and 6.5.7(a) of the National Electricity Rules.



Obligation	Description of Requirement			
	Having efficient management of our enterprise data, is a key enabler for ensuring with comply with this Act.			
Record keeping	The State Records Act 1998 (NSW) directs that all organisation records are stored in a way that makes sure the organisation meets its legislative and regulatory requirements. Under Section 11(1) of the State Records Act "each public office must ensure the safe custody and proper preservation of the State records that it has control of". Having appropriate lifecycle management of our data is one of the enablers for complying with this obligation.			
National Electricity Rules	The operating and capital expenditure objectives set out in the NER require us to maintain both the quality, reliability, and security of supply of standard control services and the reliability and security of the distribution network. Ensuring supporting Data and Analytics program is highly available and secure enables our critical business services to meet these rules.			

Table 2 Summary of Compliance Requirements obligations



4. OPTIONS

This section provides an overview of a select number of options which could credibly address our needs for more effective and reliable data and insights, and to better import, analyse and report data to meet customer expectations, support our future network requirements, and enable efficiencies in our business. The NPV associated with each option is also noted.

4.1. OVERVIEW OF OPTIONS

Two options have been considered for this investment program, which are detailed in the table below. The preferred option for the 2024-29 regulatory control period is **Option 2: Enhance Data and Analytics capability**, based on quantitative analysis demonstrating that it will unlock the most net economic benefits compared to the base case solution that has a lower NPV. Further information is provided within this section.

Option	Description	NPV
Option 1: Maintain current platform (Base	Maintain current data and analytics platform noting that this would result in:	\$Nil
case)	 Siloed data and information resulting in inefficiencies; and 	
	 An inability to leverage the current platform to realise future efficiency and transformation benefits. 	
Option 2: Enhance Data and Analytics capability (Preferred option)	Build on the (planned 2019-24) investment in the enterprise data and analytics platforms, and business capabilities, by building an advanced analytics and insights capability. This will allow us to gain insight from these data sources, adapt to new technologies and drive better outcomes for our customers.	\$42.7 million

Table 3 Overview of options

The principal difference between the two options is that option 1 maintains current capability without change or enhancement, whereas option 2 enhances and grows current capabilities to include new and expanded functions to address the changing market needs and realise operational efficiencies. Refer to Section 4.4 for Alternative Options analysis.

4.2. **OPTION 1: Base Case (Counterfactual)**

4.2.1. Description

To maintain our current data and analytics capabilities, minimal investment in our current suite of data and analytics tools would be undertaken in the 2024-29 regulatory control period under this option, with renewal deferred until the next regulatory control period (2030-34).

If we defer investment in this platform, we will raise the cost of all reporting and analytics initiatives in the long term, as the expanding data sets in our business are not directly integrated into the current platform as the business needs for these emerge. Also, we will have limited opportunities to further enhance customer experience, higher costs and lower effectiveness of data solutions to support CER and continue manual re-working to prepare data and fix errors.



Other incremental investments would be needed to renew specific DataMart licensing, perform ad hoc data cleansing, report and analytics development. Under the current platform there are several limitations, which we have discussed below. These include:

- Data management limitations, given data is sourced from range of places and can be duplicated across a range of business areas resulting in suboptimal reuse of information;
- Insights and analysis are inefficient, costly and time consuming, as data is not integrated across which limits the ability to unlock value;
- Managing multiple tools and technologies resulting in increased complexity and cost; and
- Technology landscape does not support the anticipated data growth and data processing required to meet the needs of the business into the future.

As the need for higher quality data and insights continues to grow, the existing limitations will place increasing pressure on resources that will have to rely on manual interventions to meet demand.

4.2.2. Option 1 assumptions

There are no incremental capital expenditure or operating costs in this option as the ongoing licensing and support costs are already included in our ICT forecasts for the 2024-29 regulatory control period. The baseline savings (for reduced/mitigated manual effort in ad hoc report development etc) are covered in the benefits for Option 2.

4.3. **OPTION 2: Enhance Data and Analytics capability (Preferred)**

4.3.1. Description

Under this option, in the 2024-29 regulatory control period we would further enhance investment in our data and analytics capabilities to enable further value in response to changing business needs and data sources such as CER related data. This would be done by delivering a package of work that builds on the base Enterprise Data Lake that aims to extract actionable insights from that data. This package is referred to as the 'Data to Intelligence Program'.

The key elements of the Data to Intelligence Program are:

- 1. Enterprise Data Lake Expansion: This will expand the transition of numerous critical data sets into the Enterprise Data Lake which is being established during the 2019-24 regulatory control period. This means new data sets such as those related to CER will be able easily accessed and shared to meet critical application requirements such as for those in the control room or in our field services. This avoids time-consuming and expensive processes with data preparation and validation. It also enables a single source of truth for data needs reducing or eliminating disparate, repetitive or outdated data sets across the organisation. As these additional data sets are transitioned to the Enterprise Data Lake this will enrich our agility in establishing high value insights and enabling further customer value, by minimising the need for manual reporting and analysis; and
- 2. Data to Intelligence: This is the key to being able to transform how we use data. The Data to Intelligence refers to a capability within our business that combines data (and artificial intelligence, or 'Al') development, software and integration development, and domain expertise in energy, to a function that can rapidly develop tools to address high-value analytics use cases in response to changes in the network or our business.
- **3.** Asset Data Analytics: This draws on the Data to Intelligence analytics capabilities, focusing on analytics that are specific to high value Asset Management use cases that improve our network investment and operations.



4. **Predictive Maintenance:** This draws on the Data to Intelligence analytics capabilities, establishing sophisticated AI models for predictive maintenance of our network. This will reduce overall maintenance expenditure and have a positive impact on network reliability for our customers.

The Enterprise Data Lake expansion under this option mitigates many of the issues identified in option 1 above. This includes:

- Data Lake uses scalable cloud infrastructure pay-per-use services that do not require additional licenses (e.g., Microsoft Windows or SQL Server), leading to a significantly lower running cost. Expansion of the platform's use will enable further value driven by the platform;
- Due to the above, Data Lake expansion is significantly better positioned to aggregate multiple data sources. Two key features lead to this. First the availability of tools in cloud services to work with various data types in a single platform (e.g., transactional data, image and video). The second feature is the ability of public cloud infrastructure to scale significantly more than on-premises solutions – 'petabyte scale', which we will reach within the current regulatory period; and
- Data Lake has the capacity to ingest the full dataset from a transactional system in its original ('raw') form. This is relevant as it lowers time to market since data extraction logic does not needs to be updated every time a use case requires new data, and, importantly, allows end users to explore this raw data and add it to existing models rapidly, leading to faster and higher-quality outputs from reporting and analytics.

All our analytics initiatives are dependent on this program to create reusable, well-governed data models and provide cloud-based tooling. This includes:

- Enterprise support systems, such as ERP, require this investment for embedded real-time analytics, which will benefit from the availability of high-quality data models to ease the transition to the new ERP system and provide valuable analytic capabilities back into the ERP to realise the full value of that program. Note that this is distinct from analytics provided by the ERP itself – in this scenario, analytics are done in the data platform and then the output is relayed to the ERP in real-time. An example of this might be a complex algorithm incorporating weather and asset condition data running on the Data Lake and then updating a Work Order in SAP in near real-time; and
- Other major ICT investments during 2024-29 are heavily reliant on the data and analytics
 platform such as the ICT CER investment. Whilst the data volumes related to managing
 and monitoring CER in our network will increase, so will the compliance requirements that
 need enhanced data and analytics capabilities such as the publishing of dynamic operating
 envelopes (DOEs). Maintaining the Enterprise Data Lake without further enhancements
 will minimise our ability to scale and leverage the additional customer value from insights
 for these new and expanding data sources.

4.3.2. Option 2 assumptions

The cost of this option has been forecast based on knowledge of recent market procurement for equivalent capability and services, as well as specialist advice and internal subject matter expertise.

A final business case development process will be used to refine scope, costs and impacts for the investment. A procurement activity will also be undertaken to inform costs and solution options and confirm activities undertaken represent value of money.



4.3.3. Option 2 costs

The estimated capital cost of Option is \$30.3 million, of which \$30.3 million is non-recurrent expenditure over the 2024-29 regulatory control period. There is \$0 project operating expenditure due to this program being based on a Platform-as-a-Service (**PaaS**) investment. This option will result in an uplift of ongoing operational expenditure of \$0.5 million over five years, which is driven by an estimated increase in cloud subscriptions. Further information on the costs of Option 3 is provided in the following tables.

\$ million	FY25	FY26	FY27	FY28	FY29	Total
Direct Labour	(5.0)	(5.2)	(2.9)	(0.7)	(0.7)	(14.5)
Materials	-	-	-	-	-	
Contractor services	(5.4)	(5.7)	(3.1)	(0.8)	(0.8)	(15.8)
Indirect cost	-	-	-	-	-	-
Other	-	-	-	-	-	-
Contingency	-	-	-	-	-	-
TOTAL INVESTMENT CAPEX	(10.4)	(10.9)	(5.9)	(1.5)	(1.5)	(30.3)
Non-recurrent	(10.4)	(10.9)	(5.9)	(1.5)	(1.5)	(30.3)
Recurrent	-	-	-	-	-	-

Table 4 Option 2 - Overview of Capital Cost

\$ million	FY25	FY26	FY27	FY28	FY29	Total
Direct Labour	-	-	-	-	-	-
Materials	-	-	-	-	-	-
Contractor services	-	-	-	-	-	-
TOTAL INVESTMENT OPEX	-	-	-	-	-	-
Non-recurrent	-	-	-	-	-	-
Recurrent	-	-	-	-	-	-
Ongoing new opex	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.5)

Table 5 Summary of operating costs



Cost Assumptions

The ongoing investment in the delivery of data use cases is based on assumptions of how much internal resource can be dedicated to the delivery of analytics use cases. Whilst aspects of the delivery can be outsourced, our internal resources are critical to the successful delivery of these use cases so that data is structured meaningfully, and the insights delivered are relevant.

4.3.4. NPV analysis

The key driver of the NPV analysis is the future benefits that are enabled from this investment in answering specific high value use cases.



Figure 2 Option 2 – Market NPV (\$' millions, real FY24)

The benefits Option 2 will provide are detailed in the following table.

Capability	Description of benefits	Quantifiable benefits
Asset Management (AM)	 AM strategy optimisation leveraging automated predictive models; Risks-based work prioritisation; High voltage cable replacement; and AA based optimization of vegetation inspection and trimming. 	 Ability to optimise maintenance and replacement plans allowing a dynamic, scenario-based optimisation of different outcomes; this equates to \$2.1 million capex per annum. Ability to optimise contract costs through smarter analytics. More dynamic with data driving cycle times and optimising fleet routes and truck rolls; this equates to \$1.3 million opex per annum.
Field Force	 Digital Work management solution for all works program execution. 	• Field benefits: avoided truck rolls - 20% of avoidable truck rolls are avoided, and service wire replacement program - around 50% of jobs found complete in the



		 field; this equates to \$0.1 million capex. Reduction in data maintenance team effort; this equates to \$0.25 million capex per annum. Avoided capex on projects that have data quality improvements or new data requirements this equates to \$0.8 million capex per annum.
Network Planning	 LV power flow analytics to optimise network design; and AA based models to forecast the impact of CER tech on loads and the grid. 	 Improving network design, outages, and deferring grid augmentation; this equates to \$0.6 million capex per annum. Reduction in capex projects because there is not a single model, this equates to \$0.5 million capex per annum.
Other	 Reporting efficiencies and increased insights across all multiple teams. 	Benefits have been estimated at \$0.7 million reductions in opex and capex.

Table 6 Option 2 – Overview of benefits

4.4. Alternative Options

We are mindful of the AER's Guidelines on ICT expenditure assessment in particular the development of detailed options analysis of all credible options including options of various scopes and timings and identification and quantification of all relevant benefits and residual risks for each option⁹.

Section 4.2 of our Technology Plan sets out how Ausgrid uses its Architectural Principles to drive customer benefits in our use of and expenditure on technology and how this is enforced through formal Governance processes.

In the context of this regulatory proposal, the strategies, core vendor solutions and architectural frameworks for our Data to Intelligence Program reflect the results of detailed options evaluation carried out as part of this governance process in 2022.

This initiative was part of our regulatory proposal for the period 2019-24 and the results of a detailed investigation into technical options presented to the Transformation Steering Group¹⁰.

This analysis considered business needs, architectural requirements and a detailed product assessment of five permutations of Data and Analytics tools from Microsoft, SAP, Google and Amazon Web Services¹¹.

Evaluating these five options against Ausgrid Licencing Conditions, Platform Costs, Data Integration and Management, Data Access and Performance, Development and Maintenance, and Flexibility and Ease of Scale using our architectural principles, the Transformation

⁹ Italics quoted from Assessing the prudency and efficiency of the project in Consultation paper - ICT Expenditure Assessment, AER, May 2019 p.20

¹⁰ D2I Business case (June-22) TSG review, Ausgrid, June 2022

¹¹ Big Insights Platform – Technology Options Analysis, Ignite Data Solutions,2017



Steering Group endorsed a hybrid solution of Microsoft Azure and SAP's S4 HANA in-memory data warehouse as the Data and Analytics Platform of choice for Ausgrid based on a comparative assessment of the five solutions against market research, functional capability and technical capability of the technology, and a comparison of their like-for-like costs.

During this regulatory period, Ausgrid has subsequently and independently selected Microsoft's Azure cloud solutions as a target state platform for CRM and infrastructure-as-a-service by applying the same assessment against risk, cost, benefit, performance and user experience using our architectural principles. This is the same Microsoft solution framework that that supports Azure Data and Analytics.

Microsoft Azure and SAP S4 HANA data warehouse are contemporary solutions and fit for purpose in Ausgrid's context. Migrating to an alternative solution would incur costs of data migration, integration to the rest of Ausgrid's information systems and organisational change management to train users in the new solution.

Alternative data and analytics solutions in the market would not meet customers' needs any better than Microsoft Azure with SAP but the cost of implementing them as replacements would be between 50% and 100% more than our proposed "Option 2" given the additional data, integration and change costs of moving to an alternative solution.

The detailed analysis supporting our Transformation Steering Group's selection of Microsoft remains current. Given that alternative customer management options would all be more expensive than Microsoft's with no additional customer benefit, we have rejected all alternative options as part of this project brief.

4.5. Approach to Costing

We have used revealed costs, market testing and peer review to ensure that costs for each option are efficient.

A bottom-up methodology was used to estimate the costs for each option and considered typical delivery team resource requirements, delivery partner costs and licence/subscription fees. Previous actual costs from similar projects within the Data and Analytics area were also used to estimate costs, which we have tested against industry peers directly, liaison with software vendors and through consultants' independent cost benchmarks.

Consultants and peers within Ausgrid have reviewed project labour estimates.

As outlined in section 4.2 of the Technology Strategy, a final business case development process will be used to refine scope, costs, and impacts for the proposed investment. A competitive procurement activity will also be undertaken to inform costs and solution options and ensure activities undertaken represent value of money.



5. **RECOMMENDATION**

5.1. Recommended solution

The recommended is **Option 2 - Enhance Data and Analytics capability**. This is the preferred option as it:

- Has the most favourable NPV at \$42.7 million;
- Enables the future grid and its benefits for all customers; and
- Is consistent with the National Electricity Objective (NEO) and delivers the capabilities needed to continue to meet our requirements in relation to our regulatory and other obligations.

Option 2 enhances our current data and analytics platforms in a sustainable manner to meet the needs of the changing community expectations and to drive further value from our future grid. It also enables Ausgrid to continue to reduce operating costs, improve operational efficiency, and improve safety outcomes for customers.

5.1.1. Program delivery risks

Risk #	Risk Category	Description	Inherent Risk Level	Mitigation Plan	Residual Risk Ievel
01	Key Program Resources	Key resources may not be available when needed, leading to timeline impact in project	Medium	Ensure data domain experts are well- prepared ahead of time, supplement with surge resourcing where possible	Low
02	Data Quality	Data quality issues can slow both platform engineering and analytics development	High	Leverage automated cleansing where possible. Ensure project timelines allow sufficient lead time for data cleansing activities.	Medium
03	New Technology Support Skills	Requests for additional features or capabilities not captured in the originally scope, may extend the timeline of the project.	Medium	Set scope expectations early on and define boundaries.	Low



Risk #	Risk Category	Description	Inherent Risk Level	Mitigation Plan	Residual Risk Ievel
04	Scope Expansion	Requests for additional features or capabilities not captured in the originally scope, may extend the timeline of the project.	Medium	Set scope expectations early on and define boundaries.	Low

Table 7 Summary of key program delivery risks

5.1.2. Program assumptions

Overview of key program assumptions below.

#	Туре	Description
01	Resourcing	Our technical resources will direct architecture and build patterns for data lake expansion activities, contracted services will provide build support.
		Discrete analytics to be supported by domain expertise (e.g., electrical engineering modelling expertise) where needed from within Ausgrid.
02	Priority	Prioritise foundational activities, governance and use cases in manageable phases to ensure value is delivered in a continuous fashion.
03	Scope	Scope is limited to the initiatives detailed in Section 4.3.1.

Table 8 Summary of key program assumptions

5.1.3. Program dependencies

Overview of key program dependencies below.

#	Program Name	Description
01	ICT CER	Several initiatives in this program rely on the capabilities being established in the Data and Analytics program. Any delays may impact on the timing and related benefits of the ICT CER program.
02	Customer Information Services	Several initiatives in this program rely on the capabilities being established in the Data and Analytics program. As such any delays may have a direct impact on the timing and related benefits of the Customer Information Services program.



03	ERP Transformation Program	As the technical footprint that underpins the ERP Transformation Program provides majority of the enterprise data models that support the enterprise data lake, any significant changes to these as part of the ERP Transformation program would have a direct impact on the Data and Analytics program. Therefore, this dependency needs to be managed closely.
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Table 9 Summary of key program dependencies

5.1.4. Business area impacts

#	Impacted Group	Description
01	All Ausgrid	Data and analytics for Data to Intelligence case studies will be rolled out to various teams. This will be done in a logical order to avoid business disruptions.
02	All Ausgrid	Any asset upgrade or change requires appropriate ICT change management processes to be followed. Impact to customer facing services or employees will be scheduled optimally to ensure impact and risk of unplanned outages is minimised.

Table 10 Summary of business area impacts



6. GLOSSARY

Shortened Form	Extended Form
AA	Adaptive-Additive
AI	Artificial Intelligence
АМ	Asset Management
ΑΡΙ	Application Programming Interface
BIP	Big Insights Platform
САМ	Cost Allocation Methodology
Capex	Capital Expenditure
CER	Consumer Energy Resources
DNSP	Distribution Network Service Provider
DOEs	Dynamic Operating Envelopes
DSO	Distribution System Operator
ERP	Enterprise Resource Planning
FY25-29	Financial Year 2025 to Financial Year 2029
HV	High Voltage
ІСТ	Information, Communication and Technology
LV	Low Voltage
ML	Machine Learning
NEL	National Electricity Law
NEO	National Electricity Objective
NER	National Electricity Rules
NPV	Net Present Value
NSW	New South Wales
Орех	Operating Expenditure
PaaS	Platform-as-a-Service



Shortened Form	Extended Form
PV	Photovoltaic
SaaS	Software-as-a-Service
SCS	Standard Control Services
SOCI	Security of Critical Infrastructure Act 2018
SLACI	Security Legislation Amendment (Critical Infrastructure) Act 2021
SLACIP	Security Legislation Amendment (Critical Infrastructure Protection) Act 2022
TRIFR	Total Recordable Injury Frequency Rate



7. APPENDICES

Appendix 1 Big Insights Platform

The following figure summarises the key elements of the Big Insights Platform.

Big Insights Platform - Current state



Governance, Security & Infrastructure

Source: McKinsey Report 2021



Appendix 2 Data and Analytics and links to other program briefs

The following diagram summarises the key elements of our transformation program.



Figure 3 Data and Analytics and links to other program briefs



Appendix 3 Risk Assessment – Option 1

Table 1 - Option 1 - Key risks and residual risk position by 2029 summaries the inherent risks which could be experienced by the end of the coming regulatory control period of (2029) if the base case (counterfactual) option is selected.

Option 1 does not reduce the likelihood or impact of risk R1 materialising. By 2029, it is **Possible** the risk will materialise causing **Major** impact to the organisation.

The equivalent risk analyses provided with the recommended option (Option 2) have been conducted with respect to effectiveness of mitigating the below base case risks. This assessment has been undertaken in alignment with the Ausgrid Groups Risk Management Framework.

Risk Description	Inherent Risk 2029	Nature of Mitigation	Residual Risk 2029
R1 – Business Operational Impact	High	While access to source data will remain, the inability to	High
Ineffective business intelligence toolsets leads to Business Units not being able to support decisions with data.		consume this in a timely 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.	

Consequence Insignificant Minor Moderate Major Severe Almost certain Likelihood Likely R1 Possible Unlikely Rare Pre-mitigation risk Low Risk 3 High Risk 1 Post mitigation risk 2 Medium Risk Extreme Risk л

Table 11 Option 1 - Key risks and residual risk position by 2029

Figure 4 Change in risk position with Option 1 by 2029



Appendix 4 Risk Assessment – Option 2

Table 1 - Option 2 - Key risks and residual risk position by 2029 summaries the inherent risks which could be experienced by the end of the coming regulatory control period of (2029).

Option 2 reduces the likelihood and impact of residual risk R1 materialising. By 2029, it is **Unlikely** the risk will materialise causing **Moderate** impact to the organisation.

Risk Description	Inherent Risk 2029	Nature of Mitigation	Residual Risk 2029
R1 – Business Operational Impact Ineffective business intelligence toolsets leads to Business Units not being able to support decisions with data.	High	Increase BIP toolset maturity by enabling advanced insight and analytic capabilities to support business decision making effectively and efficiently.	Medium

Table 12 Option 1 - Key risks and residual risk position by 2029



Figure 5 Change in risk position with Option 2 by 2029