

E2E - Stage 2 options analysis (project initiation)

_IES_D_AMITS_AMIS Distribution enhancements - R24_IES_D_AMITS_AMIS Distribution enhancements - Summary (IES)

❖ For work being proposed for inclusion into the capital works program.

Project name:	Asset Management Information System (AMIS) Improvement Program
Department:	Transformation, Strategy & Digital
Investment Type:	Distribution
Investment Category:	Standard Control - Operational Support Systems
Functional Area(s):	AMITS
Project Zone location:	http://assetzone.tnad.tasnetworks.com.au/R24_distribution/ICTOT
Document Number:	R0002201733
Needs Item Reference:	2201733
Regulatory Investment Test Required?	No
Version Number:	0.5
Date:	25/10/2022

❖

Preferred Option:			Option 1		
Level 1 Estimate +/- 30 per cent (preferred option – base dollars):			\$6.7M		
Expenditure profile	FY25	FY26	FY27	FY28	FY29
Capex	\$1.6M	\$1.4M	\$1.3M	\$1.2M	\$1.2M
Opex	\$0	\$0	\$0	\$0	\$0

❖

Sign-offs (in support of the recommended option)			
Works Initiator:		Date	Click here and type the date.
Leader: (Endorsement)		Date	Click here and type the date.
Leader or General manager noting delegation levels. (Approval) ¹		Date	Click here and type the date.

¹ Approval based on delegation level.

❖ denotes mandatory field

1. RELATED DOCUMENTS

Description	URL
NPV	http://assetzone.tnad.tasnetworks.com.au/R24_distribution/ICTOT/R24_NPV_D_AMITS_AMIS%20Distribution%20enhancements.xlsx
TasNetworks Digital Technology Strategy	http://businesszone.tnad.tasnetworks.com.au/strategies-and-plans/Stratetgies/TasNetworks%20Digital%20Technology%20Strategy_v2.0.pptx
TasNetworks Towards 2030	
Future Distribution System Vision	
TasNetworks Corporate Plan	
TasNetworks Business Plan	
TasNetworks Risk Management Framework	
National Electricity Rules (NER)	

2. OVERVIEW

2.1 APPROVAL GATE STATUS



Approval Gate	Approver Title	Approver Name	Date
Gate 1 – Needs	Not Required		
Gate 2 – Option	This project seeks OPTIONS APPROVAL to proceed		

In line with the Gated Investment Framework this Project seeks Gate 2 Option approval to proceed to budget and financial approvals. This IES presents economic and risk assessments for each option considered, together with recommendation of a preferred option to address the business need.

2.2 BACKGROUND

TasNetworks owns, maintains and operates critical infrastructure comprising of physical distribution assets, supporting information technologies, communication networks and advanced control schemes. It plays a critical role in the security, social and economic wellbeing of Tasmania and other regions of the National Electricity Market (NEM). As an asset intensive industry, TasNetworks is obligated by the Tasmanian Economic Regulator (TEC) to observe ‘good electricity industry practice’ as adopted by the national electricity supply industry for the planning, design, construction, maintenance and operation of its distribution system to ensure that the relevant standards for safety and reliability of the system are consistent with community, business and customer needs. Following the formation of TasNetworks from predecessor companies, and the ongoing program of consolidation of asset management systems, the Asset Management Information System (AMIS) Improvement Program (AMISIP) was established to implement the necessary processes, data improvements, integration and tools required to support strategic, tactical and operational asset management in accordance with the company’s current Asset Management Policy.

This Regulatory Reset (RR24) investment seeks to build upon the previous revenue reset outcomes to further implement, improve, integrate and consolidate AMIS in the future.

2.3 PROBLEM DEFINITION

In accordance with its Asset Management Policy, TasNetworks has developed its Asset Management System in accordance with AS/NZS/ISO55001:2014 – Asset Management – Management System – Requirements. A key requirement is that asset management and the asset management system be continually improved. To achieve this objective the Asset Management Information System Improvement Program (AMISIP) was established and has been successfully implemented to undertake specific improvements in the current regulatory period. The distribution electricity system continues to evolve to meet changing customer needs and this evolution is defining increased data breadth and quality for our asset data for use in real time, asset management, analytic and geospatial systems. The inclusion of connectivity models for both High Voltage and Low Voltage distribution networks has defined and increased capability in asset master data management, including the modelling of proposed assets for use in the distribution management system asset commissioning process.

Building on the foundation of the current period AMISIP, the ongoing improvement of the Asset Management System will continue to be a focus over the next regulatory period and the AMISIP has been scoped to achieve key improvement outcomes.

3. CUSTOMER NEEDS AND IMPACT

TasNetworks as a Distribution Network Service Provider (DNSP) is responsible for the delivery of safe and reliable energy to customers at a consistently high quality. The prudent management of the electricity networks requires detailed high quality data to make sound asset maintenance, replacement and augmentation decisions as well as real time operational decisions relating to energy flows, faults and voltage quality. As customer behaviour changes, the utilisation of our network assets and the behaviour of our electricity network is also changing, requiring increased insights into our asset performance and improved techniques for understanding condition monitoring. As our customers continue to connect solar PV, batteries, EV's and smart appliances to our system, improved data analytics will be required to understand constraints in the network and forecast constraints to allow the dispatch of distributed energy resources. Coupled with the AMI meter rollout providing significant volumes of granular load data to manage and analyse, the systems, tools and integration required to support our asset management related systems will continue to evolve and improve. This improved capability will enable TasNetworks to continue to deliver high quality energy supplies to meet our evolving customer needs.

4. CORPORATE ALIGNMENT❖

4.1 BUSINESS PERFORMANCE OBJECTIVES

This project will help achieve the customer and business performance objectives in TasNetworks' Corporate Plan, and as shown in Table 2.

Table 1 Performance objectives relevant to this project.

Performance category	Performance measure	Investment impact on performance
Safety and wellbeing	Significant incidents	High quality data and well integrated asset management systems allow for risk based assessment and condition based asset management decisions that can avoid catastrophic failure to plant, thereby reducing the likelihood of employee and community safety incidents.
Our customers	Customer net promoter score	Prudent and efficient asset management investment driven from asset management data enables optimum network reliability outcomes from network assets, thereby improving customer satisfaction.
Our people	Employee engagement	Reducing the manual effort required to find, verify and manipulate asset data to make business decisions cause frustration and negative engagement for highly skilled asset management practitioners. Well integrated systems

Performance category	Performance measure	Investment impact on performance
		with high quality data improves employee engagement.
Our business - Network service	Service incentive bonuses earned - transmission and distribution	Key asset operational data relating to ratings and operational limits is required at a high quality to drive real time operational decisions to reduce outage times and to also drive automation schemes to restore customers to service quickly.

4.2 RISK OBJECTIVES

This project will assist in mitigating key business risks identified in TasNetworks' Corporate Plan. Table 3 presents all business risks, identifying those that would be positively impacted by the proposed project.

A detailed assessment of the risks mitigated by the project is presented in Section 5.3.

Table 2 Business risks mitigated by this project

Key Business Risks	Describe the specific risk(s) to which the business is currently exposed, for mitigation through the proposed project, and how it aligns with the Key Business Risk(s)
Death or Injury (Employee)	Asset Management data is utilised in asset maintenance, replacement and operational real time systems to detect impending faults. High quality data allows safety logic to be applied to minimise the probability of operational staff injury or death.
Death or Injury (Public)	Asset Management data is utilised in asset maintenance, replacement and operational real time systems to detect impending faults. High quality data allows safety logic to be applied to minimise the probability of injury or death to members of the community.
Widespread Power Disruption	The core asset data is utilised by asset management staff to make decisions on asset lifecycle management to minimise the risk of failure causing power disruptions. Asset management data from the AMIS is also harnessed by real time systems to avoid or minimise power outages, including enabling automation to restore customers to service automatically.
Bushfire Start	Automation systems utilise asset management information system data to determine the precautions to be enabled on high bushfire risk days and the connectivity model information derived from the AMIS data are used to enable automation systems to remotely control devices to put in place precautions.
Customer Focus	AMIS data is utilised heavily to understand the connectivity of individual customers to their electricity source, thereby enabling automation and real time monitoring.
Cyber Security	Secure integration between asset management systems and the real time DMS and SCADA systems is required due to the critical infrastructure designation of these mission critical systems.

Key Business Risks	Describe the specific risk(s) to which the business is currently exposed, for mitigation through the proposed project, and how it aligns with the Key Business Risk(s)
Emerging Complexity of the NEM	Increasing network complexity is driving more accurate data quality for assets and new use cases for real time system forecasting, analytics and asset utilisation patterns. In the absence of the AMIS IP, manual quality checking and data manipulation would be required.

4.3 STRATEGIC OBJECTIVES

The capital expenditure proposed will be utilised to meet the capital expenditure objectives as defined in the National Electricity Rules (NER) as follows:

NER Objective	Relationship to NER Capital Objective
Meet or manage the expected demand for standard control services over that period	AMIS data is heavily utilised to run business processes that deliver standard control services. Investment in data quality and data remediation is a prudent approach to ensuring data driven automation and processes meet the market needs.
Comply with all applicable regulatory obligations or requirements associated with the provision of standard control services	AMIS data is heavily utilised in delivering services that comply with regulatory obligations and in creating the mandatory regulatory reporting to confirm that compliance has been achieved. Investment in data quality and data remediation is a prudent approach to ensuring data driven automation and processes meet the market needs.
Maintain the quality, reliability and security of supply of standard control services	AMIS data is used to construct high quality connectivity models for HV and LV to enable the Distribution Management System and Outage Management System functionality. Investment in data quality and data remediation is a prudent approach to ensuring data driven automation and processes meet the market needs.
Maintain the reliability, safety and security of the distribution system through the supply of standard control services.	AMIS data is utilised in asset maintenance, replacement and operational real time systems to design networks to deliver reliable power, detect impending faults and run automation programs to manage improved fault restoration. High quality data allows safety logic to be applied to minimise the probability of injury or death to members of the community.

The investment program proposed will provide foundation capability to deliver the advanced network control capabilities required to achieve the TasNetworks Vision 2030 and the Future Distribution Network strategy.

PROJECT OBJECTIVES❖

In accordance with ISO 55000, an Asset Management Information System (AMIS) is a combination of people, processes, data and technology that combine to provide the essential outputs for effective asset management. These outputs include:

- reduced risk;
- enhanced network performance;
- enhanced regulatory compliance;
- effective asset knowledge management; and
- effective resource utilisation and optimum infrastructure investment.

The AMIS management model implemented by TasNetworks has the objectives of:

- ensuring that holistic asset information is maintained and made available to support evidenced based decision making;
- enhancing the visibility, accessibility and trust in our asset data holdings;
- sustaining and improving network performance; and
- adopting continual improvement practices to support the asset management process.

Over the past 5 years following the implementation of our central Asset Management System the AMISIP program has invested in improving asset data quality, reducing duplication, improving integration and integrating multiple satellite systems to manage workflows and obtain required data to make asset related decisions. Over this period there has been an increasing emphasis on the asset management systems, data and processes to drive more onerous use cases to leverage value for customers. This has required an emphasis on data completeness, breadth, timeliness and lifecycle status information. Through investments in building capability in, and consolidating our Geospatial Systems into a single enterprise system, asset data is now used to create high quality electricity connectivity models utilised for real time decision making in the Distribution Management System and Outage Management System. This asset data quality requirement is extending further into the low voltage electricity network requiring increased data management and modelling capability.

As the electricity becomes more complex with two way power flows driven by customer behaviour, the use of analytic capability is being built to determine network, asset and energy flow insights to assist understand emerging constraints and to, in the future, enable our distributed energy resource management. Although not delivering the core analytics platform, the AMISIP will identify extended data requirements for analytics use cases, will modify and extend systems to cater for these new use cases, and will expand integration between systems to allow analytic platforms to deliver beneficial use cases.

Requirements relating to integrating AMI meter data and Asset Condition Monitoring into our models, and relating all information back to underlying asset performance decisions requires ongoing investment improving our asset management systems.

AMISIP will continue to develop improved business systems and processes to further improve the efficiency of TasNetworks asset management activities on an ongoing basis. The key areas of investment envisaged over this investment period is as follows:

DISTRIBUTION Investment	DESCRIPTION	24/25	25/26	26/27	27/28	28/29	Stream Total
Modelling Capability	Build capability uplift in modelling capability for connectivity, forecasting, load and constraint management	591,150	594,615	504,525	365,925	365,925	2,422,140
Data and Data Analytics	Build tools and systems to improve the the value that can be extracted from asset and related data	158,340	158,340	158,340	158,340	158,340	791,700
Master Data Management	Invest in tools and processes to improve master data management capability and extend to proposed assets	415,800	252,945	252,945	252,945	252,945	1,427,580
Drawing Management and capability uplift	Improve the systems, processes and integration with drawing management participants to improve design drawing integration into GIS and other systems	154,875	192,990	102,900	154,875	192,990	798,630
Interconnected Systems (Integration)	Leverage multiple systems to manage data flows and undertake data reconciliation and quality activities	69,300	69,300	69,300	69,300	69,300	346,500
System Upgrades and Enhancements	Upgrade multiple asset management systems and provide functional enhancements to meet regulatory requirements	207,900	138,600	207,900	138,600	207,900	900,900
		1,597,365	1,406,790	1,295,910	1,139,985	1,247,400	

These investment programs will support the 'our business' strategic goal as it will interlink asset management processes and information through the entire asset lifecycle of- asset creation, operation and maintenance, performance monitoring, decommissioning and disposal. AMISIP will be continuously developed to deliver a robust platform for the extraction of asset information for an increasingly complex purposes.

5. OPTIONS ANALYSIS❖

5.1 OPTIONS CONSIDERED AND ECONOMIC ANALYSIS

Table 4 lists the options considered, the outcome of the economic analysis for each option, and the option being proposed for endorsement in this Investment Evaluation Summary. Details of the NPV analysis are included in Appendix A1. It is important to note that the costing for this project includes the synergy of a common control system platform shared across Transmission and Distribution and investments below assume that the Transmission projects are funded as a part of the regulatory price determination process for 2024-2029.

Table 3 Options considered

Option No.	Option summary	Direct cost (\$m)	NPV (\$m)	Preferred option (yes/no)	Reason for selection/rejection
0	Do nothing – This option is included for comparison purposes as the baseline scenario and involves no investment in the Network Control System over the 5year period	0	0	No	This option is not viable as the reliance on high quality asset management data and systems is required to prudently and efficiently manage the risk, lifecycle and performance of electricity network assets.
1	Undertake the Asset Management Information Systems Improvement Program (AMISIP) - This option continues the improvement program to increase the modelling capability, improve data quality, enable data analytic use cases, improve master data management, improve drawing management capability and undertake integration improvements and system upgrades.	\$6.7M	-\$0.4M	Yes	This options balances the requirement to meet changing customer needs and the risk of not having capability in place when required by potential regulatory obligation changes in the future.

E2E - Stage 2 options analysis (project initiation)

5.1.1 OPTION 0: DO NOTHING

This option ceases any further investment in improving our asset management systems. This option fails to contribute towards the mitigation of key business risk and strategic objectives. This option is not considered a viable option and is included for the purposes of comparison as a baseline scenario.

5.1.2 OPTION 1: DELIVER THE AMISIP

This option continues to build on the foundation set by the successful AMISIP and will invest in building improved modelling capability, improved data to support evolving analytic use cases, enhancements to master data management, improving the drawing management capability, improving integration between asset management systems and undertaking required system upgrades and enhancements.

This option is the preferred option.

5.2 OPTION EXPENDITURE PROFILES

The following tables show the expenditure profile for each investment option.

Option 0 – Do nothing Estimate (in nominal dollars) \$					
Option 0 expenditure profile	FY25	FY26	FY27	FY28	FY29
Capex	0	0	0	0	0
Opex	0	0	0	0	0

Option 1 – Estimate (in nominal dollars) \$					
Option 1 expenditure profile	FY25	FY26	FY27	FY28	FY29
Capex	1.6M	1.4M	1.3M	1.2M	1.2M
Opex	0	0	0	0	0

5.3 RISK MITIGATION

The matrix presented in Table 6 compares the options, showing how each assists TasNetworks in mitigating its key business risks (previously identified in section 4.3 “Risk objectives”).

Appendix B provides supporting details of the risk assessment outcomes presented in Table 6.

Table 6 Risk matrix summary

Risk Drivers	Current risk (Corporate Plan)	Option 0 – Do nothing Unmitigated risk	Option 1 - Net risk
Death or Injury (Employee)	High	Very High	High
Death or Injury (Public)	High	Very High	High
Widespread Power Disruption	Medium	Very High	Medium
Bushfire Start	High	Very High	High
Customer Focus	Medium	Low	Medium
Business Continuity Management	Medium	Very High	Medium
Tasmanian Power System Complexity	Medium	High	Medium
Emerging Complexity of the NEM	High	Very High	Medium

5.4 QUANTITATIVE RISK ANALYSIS

Quantitative risk analysis was not undertaken as a part of this IES.

5.5 BENCHMARKING

No direct benchmarking of these services have been undertaken due to the difficulty in gathering granular data relating to the specific AMIS IP activities that are typically undertaken each regulatory period. DNSP's have widely differing models and cost allocation for these activities and the cost of benchmarking has been assessed as greater than the benefit of undertaking this assessment.

5.6 PREFERRED OPTION

The preferred option is Option 1 – continuing to deliver the Asset Management Information System Improvement Program to ensure TasNetworks is managing the electricity system in a prudent and efficient manner using good industry practice.

6. INVESTMENT TIMING❖

The investment timing is indicated by the sped profile of the preferred option, commencing in July 2024 and concluding in June 2029.

7. EXPECTED OUTCOMES AND BENEFITS

The benefits to TasNetworks from implementation of the preferred option will be:

- AMIS will ensure that network asset information across all network assets will be available to support evidence based asset management decision making;
- AMIS will provide enhanced visibility, accessibility and trust in network asset information and processes;
- AMIS will support ongoing improvement in network performance; and
- AMIS will ensure the development and adoption of continuous improvement practices to support appropriate asset management processes and practices.

The expected key benefits are summarised as follows:

- improved trust in the accuracy, completeness and integrity of network asset information and processes resulting in improved uptake;
- increased confidence to make decisions that are based on high quality and reliable asset information;
- improved network asset information and processes to support revenue determination submissions;
- enhanced asset management processes will be embedded into daily activities;
- improved asset information accuracy, integrity, quality and availability that supports best appropriate practise asset management decision making; and
- reduction in the number/duration of outages due to improved network availability resulting from improved asset information and processes.

8. RECOMMENDATION ❖

It is recommended that the preferred option is approved and progressed as it best satisfies the customer and business needs.

APPENDIX A – ECONOMIC ANALYSIS

The assumptions used in the economic analysis are as follows:

- NPV analysis is carried out for a 10 year period (2024-33).
- Weighted Average cost of Capital (WACC) of 2.79 per cent is used.
- Value of Customer Reliability (VCR) of \$30,950 per MWh of electricity is used for calculating cost of customer outages.
- No voluntary load shedding has been assumed.
- Reduction in system losses has been ignored.
- 10% of project cost is assumed to be software and a 22% support opex cost is assumed as incremental operations and maintenance cost (OPEX).

The results of the Economic Analysis are provided below:

<u>ANALYSIS OF OPTIONS</u>							
		Option 0 Status Quo - Do Nothing	Option 1 Deliver AMIS Program of work	Option 2 Not applicable	Option 3 Not applicable	Option 4 Not applicable	Option 5 Not applicable
CASHFLOW	<i>flow</i>						
Capital Expenditure	Cash outflow	-	(6,687,450)	-	-	-	-
Operational Expenditure	Cash outflow	-	-	-	-	-	-
Operational Cost savings	Cash inflow	-	-	-	-	-	-
Total Expenditure	Cash outflow	-	(6,687,450)	-	-	-	-
Revenue	Cash inflow	-	-	-	-	-	-
Net Cashflow	Net cash	-	(6,687,450)	-	-	-	-
CASHFLOW NPV		-	(6,359,738)	-	-	-	-
PLUS NON CASH							
Non Cash Benefits	Non cash in	-	6,255,259	-	-	-	-
Non Cash Costs	Non cash out	-	-	-	-	-	-
Net Value	Net Value	-	(432,191)	-	-	-	-
COST BENEFIT NPV		-	(442,781)	-	-	-	-
	RANKING		1				
Status Quo - Do Nothing	Option 0	-	-	-	-	-	
Deliver AMIS Program of work	Option 1	(6,687,450)	-	(6,687,450)	(6,359,738)	(442,781)	1
Not applicable	Option 2	-	-	-	-	-	
Not applicable	Option 3	-	-	-	-	-	
Not applicable	Option 4	-	-	-	-	-	
Not applicable	Option 5	-	-	-	-	-	

APPENDIX B – KEY BUSINESS RISK COMPARISON

The project options each have a different impact on key business risks. The table below provides a qualitative summary of the impacts of each option on key business risks, with consideration for the risk approach and risk management process outlined in TasNetworks’ Risk Management Framework.

Key business risks	Current risk as per Corporate Plan			Option 0 (Description of the ‘Do nothing’ scenario)				Option 1 (Description)			
	Likelihood	Consequence	Risk	Likelihood	Consequence	Risk	How does this option mitigate current situation risk?	Likelihood	Consequence	Risk	How does this option mitigate current situation risk?
Death or Injury (Employee)	Possible	Major	High	Possible	Severe	Very High	This option may result in an increased risk as the asset will be operated after the EOS date.	Unlikely	Severe	High	High availability critical systems monitoring and protecting electricity networks
Death or Injury (Public)	Possible	Severe	High	Likely	Severe	Very High	Not maintaining licences and support agreements may result in an increased risk.	Possible	Severe	High	Replacing the asset will maintain the current level of risk.
Widespread Power Disruption	Possible	Major	Medium	Possible	Major	Very High	This option may result in an increased risk as the asset will be operated after the EOS date.	Possible	Major	Medium	High availability critical systems monitoring and protecting electricity networks
Bushfire Start	Unlikely	Severe	High	Possible	Severe	Very High	Not maintaining licences and support agreements may result in an increased risk.	Unlikely	Severe	High	Replacing the asset will maintain the current level of risk.
Customer Focus	Unlikely	Moderate	Medium	Possible	Moderate	Low	This option maintains an unacceptable increase in unscheduled outages and a follow-on decline in network reliability.	Unlikely	Moderate	Medium	A decrease in unscheduled outages and a follow-on decline in network reliability
Business Continuity Management	Possible	Moderate	Medium	Possible	Major	Very High	Overly complex processes to undertake evidence-based decision making.	Possible	Moderate	Medium	Enables the ability to effectively comply with TasNetworks strategic goals
Cyber Security	■	■	■	■	■	■	Not maintaining licences and support agreements may result in an increased risk.	■	■	■	Replacing the asset will maintain the current level of risk.
Power System Complexity	Possible	Moderate	Medium	Likely	Moderate	High	Lack of accurate and current data, process and people to support systems increases the risk.	Possible	Moderate	Medium	Replacing the asset will maintain the current level of risk.

Key business risks	Current risk as per Corporate Plan			Option 0 (Description of the ‘Do nothing’ scenario)				Option 1 (Description)			
	Likelihood	Consequence	Risk	Likelihood	Consequence	Risk	How does this option mitigate current situation risk?	Likelihood	Consequence	Risk	How does this option mitigate current situation risk?
Emerging Complexity of the NEM	Likely	Major	High	Almost certain	Major	Very High	Makes it difficult to effectively comply with statutory, legal and regulatory obligations.	Possible	Moderate	Medium	Replacing the asset will maintain the current level of risk.