

**PRELIMINARY BUSINESS CASE
ADVANCED DISTRIBUTION MANAGEMENT SYSTEM UPGRADE**

FOR INFORMATION

Date Prepared: 16 December 2022

Recommendation

That Essential Energy endorses this preliminary business case for investment to upgrade the PowerOn Advanced Distribution Management Systems capability.

As a preliminary business case, this paper analyses the drivers for investment and the options to address those drivers. It identifies the likely costs, benefits, risks and impacts of the proposed investment in order to inform organisational planning and forecasting.

Consistent with Essential Energy's investment governance processes, prior to proceeding with the proposed investment a detailed delivery business case will be developed and evaluated.

Executive Summary

This business case proposes investment in the upgrade of Essential Energy's Advanced Distribution Management System (ADMS). The ADMS enables Essential Energy to effectively manage, monitor and control the electrical distribution network.

In the current Regulatory Control Period (RCP) Essential Energy is undertaking an investment to migrate from the legacy GE "PowerOn Fusion" ADMS platform, to the newer generation GE "PowerOn Advantage ADMS Series 6" product-set. In addition, this same investment is making improvements in other related areas such as Alarm Management. Essential Energy is adopting the Australian Standard IEC 62682:2017 - Management of Alarm Systems for Process Industries. Using this standard to effectively prioritise alarms, Essential Energy's system controllers can better manage alarms and respond appropriately in a timely manner. This will result in benefits to our customers such as reduced outage response times.

In the coming RCP, a further "mid-life" upgrade of the PowerOn platform is forecast to be required. As well as renewing the underlying technology layers for ongoing supportability, the upgrade will be leveraged to enable further network control and operational improvements.

The ADMS is required to integrate and manage Distributed Energy Resources (DER) efficiently and to support the increasing customer expectations in regard to DER. Load Flow Analysis based on real-time or near real-time data is a key capability in managing the increase of generation to the electricity grid. This allows Essential Energy to understand where DER operation is constrained, network areas that pose the highest risk in relation to capacity and load constraints, or where opportunities for DER are located. The goal of this analysis is to improve the overall reliability of the network. With Load Flow Analysis capability, Essential Energy will be positioned to further adopt more advanced power restoration capabilities.

The proposed investment is required to address the following drivers:

- **Compliance and Risk:** Risk of non-compliance with existing or future legislative obligations due to capability limitations or potential long-term unsupportability of the ADMS solution. Maintaining a contemporary and supported ADMS mitigates the risk of prolonged system outages impacting customers. Possible future failure of the ADMS may also impact the safety of staff and the community. This risk will be minimised through keeping the platform current, with the additional benefit of improving resilience to cyber security threats.
- **Business Improvement:** With the introduction of new capability in the ADMS there is opportunity to improve business processes and functions.
- **Productivity Improvement:** There is an opportunity for productivity improvement with the introduction of a suitable Load Flow Analysis capability with the upgraded ADMS, compared with the current practice involving extensive use of planning and modelling tools outside the ADMS. In addition, new or improved integration to Essential Energy systems such as the Geographic Information System (GIS), Market Systems, Enterprise Asset Management (EAM) system and Pi Historian will contribute further to process efficiencies by sharing data more broadly.

This business case considers two options, contrasted with the counterfactual base case:

- **Base Case**
Continue to operate the existing system, with minimal incremental investment.
- **Option 1: Upgrade the Advanced Distribution Management System (Recommended)**
Undertake a "mid-life" upgrade of the ADMS providing a roadmap for future sustainability, compliance, and an enabler of productivity improvement through new capability and robust integration with Essential Energy systems.
- **Option 2: Migrate to a new Advanced Distribution Management System**
Undertake a replacement of the ADMS with a new solution that provides a roadmap for future compliance and productivity improvements, and robust integration to Essential Energy systems.

Option 1 is recommended with investment beginning in FY25. Total project expenditure is ██████ (FY24 Real Terms) with an NPV of ██████. This investment will support the customer and community through:

- Continued provision of safe, reliable, and secure electricity, thereby avoiding potential customer service disruption.
- Flexibility to efficiently support the growth in DER and other evolving distribution network requirements, including renewable energy.
- Improved operational efficiency and capability through the provision of real-time Load Flow Analysis facilitating what-if scenarios and near-term planning for the electricity network.

Project Summary

Preliminary Business Case – Distribution Management System		
Investment Value	Expenditure (Recommended Option)	\$M FY24 Real Terms¹
	Seed funding (actual)	█
	This approval:	
	Project Capex	█
	Project Opex -	█
	Total program/project expenditure	█
	Ongoing Opex p.a.	
Benefits	Financial Benefits p.a. (Recommended Option)	\$M FY24 Real Terms
	Risk Mitigation and contributor to Productivity Improvement.	Non-incremental
	Ongoing Benefit Value (p.a.)	-
Corporate Strategy	<ul style="list-style-type: none"> • Network of the Future • Resilience and Reliability • Other Essential Services 	
Business Drivers	<ul style="list-style-type: none"> • Compliance and Risk • Business Improvement • Productivity Improvement 	
Date Needed	June 2028	

¹ All figures presented in this document are provided in middle of the year 2023/24 real dollar terms and represent whole-of-business values prior to application of the Cost Allocation Model (CAM).

Contents

1. Business Drivers	5
1.1. Compliance Obligations	6
1.2. Corporate Strategy Alignment	7
1.3. Current State	7
1.4. Existing Issues	8
1.5. Inherent Risks	8
2. Options Analysis	11
2.1. Base Case: Continue to operate the existing ADMS, with minimal incremental investment.	11
2.2. Option 1: Upgrade Advanced Distribution Management System (Recommended)	13
2.3. Option 2: Migrate to a new Advanced Distribution Management System	17
3. Financial Comparison	22
4. Dependencies	22
5. Organisational Change Impacts	22
6. Conclusion	23

1. Business Drivers

The GE PowerOn ADMS is Essential Energy's primary distribution network control platform. This critical system enables real-time distribution network assurance, outage management, and remote Supervisory Control and Data Acquisition (SCADA) operations. This system functionality is instrumental in keeping our employees, contractors and customers safe as well as supporting a reliable supply of electricity.

In the current RCP, Essential Energy is undertaking an investment to migrate from the legacy GE "PowerOn Fusion" ADMS platform, to the newer generation GE "PowerOn Advantage ADMS Series 6" product-set. In addition, this same investment is making improvements in other related areas such as Alarm Management. Essential Energy is adopting the Australian Standard IEC 62682:2017 - Management of Alarm Systems for Process Industries. Using this standard to effectively prioritise alarms, Essential Energy's system controller can better manage alarms and respond appropriately in a timely manner.

In the coming RCP, a further "mid-life" upgrade of the ADMS Series 6 platform is forecast to be required. This upgrade will be another significant activity as it is planned Essential Energy will move to ADMS Series 7. As well as renewing the underlying technology layers for ongoing supportability, the upgrade will also be leveraged to enable further network control and operations improvements. Changes in the broader digital environment and architecture will also be considered when investing in the ADMS capability.

Management of the electricity distribution network is becoming progressively more complex and dynamic with increasing DER at varying voltage levels connecting to the network. There is also a growing demand to have large scale generation connect to the network as renewable energy sources continue to grow and replace established electricity generation methods. Improved ADMS capabilities are required to integrate and manage DER efficiently and to support the increasing customer expectations in this regard.

Load Flow Analysis based on real-time or near real-time data is a key capability in managing the network. This allows Essential Energy to understand where DER operation is constrained or is causing constraints on the network, network areas that pose the highest risk or where opportunities for DER are located. The goal of this analysis is to improve the overall reliability of the network. With Load Flow Analysis capability Essential Energy will be positioned to adopt more advanced system capability such as Automated Power Restoration.

The proposed investment is required to address the following drivers:

- **Compliance and Risk:**

Risk of non-compliance with existing or future legislative obligations due to capability limitations or potential long-term unsupportability of the ADMS solution.

Maintaining a contemporary and supported ADMS mitigates the risk of prolonged system outages impacting customers. Possible future failure of the ADMS leading to the loss of visibility of the electricity network increases the safety risk for staff and the community. This risk will be minimised through keeping the platform current, with the additional benefit of improving resilience to cyber security threats.

- **Business Improvement:**

With the introduction of new capability in the ADMS there is opportunity to improve business processes and functions.

- **Productivity Improvement:**

There is an opportunity for productivity improvement with the introduction of a suitable Load Flow Analysis capability with the upgraded ADMS, compared with the current practice involving extensive use of planning and modelling tools outside the ADMS.

In addition, new or improved integration to Essential Energy systems such as the GIS, Market Systems, EAM system and Pi Historian will contribute further to process efficiencies by sharing data more broadly.

PRELIMINARY BUSINESS CASE – Advanced Distribution Management System Upgrade

1.1. Compliance Obligations

Through this investment, Essential Energy will ensure compliance with legislation, regulations, codes, and standards as summarised below.

Instrument	Obligations	Investment relationship to obligation
Gas and Electricity (Consumer Safety) Act Work Health and Safety Act (section 274)	Safe operation of the distribution network as specified in the Gas and Electricity (Consumer Safety) Act and the Work Health and Safety Act.	The proposed investment will ensure the ADMS capability is positioned for long-term supportability, enabling compliance with all legislative and other Distribution Network Service Provider (DNSP) related obligations.
Electricity Supply Act National Electricity Rules	Obligations as specified in the Electricity Supply Act and the National Electricity Rules.	
National Environment Protection Act Environment Protection & Biodiversity Conservation Act Sustainable Planning Act	Obligations as specified in the Environment Protection Act, the Environment Protection & Biodiversity Conservation Act, and the Sustainable Planning Act, requiring timely and accurate network incident and fault data.	
Security Of Critical Infrastructure Act	Obligations as specified in the Security of Critical Infrastructure Act, with strong security and controls over data regarding the configuration and operation of the distribution network.	
Essential Energy NSW Distributor Licence Conditions	Obligations as specified through Essential Energy's Distributor Licence Conditions, including obligations for management of Critical Infrastructure systems and processes as overseen by IPART (the NSW Independent Pricing and Regulatory Tribunal)	

The proposed investment is aligned with the National Electricity Rules “capital expenditure objectives” (NER 6.5.7(a)) as described below.

NER Capital Expenditure Objectives	Alignment
6.5.7(a)(2) <i>the forecast capital expenditure complies with all applicable regulatory obligations or requirements associated with the provision of standard control services</i>	The ADMS enables Essential Energy to operate and control the electricity distribution network consistent with the role of a DNSP. This proposed investment will ensure sustainability of the ADMS platform, thereby enabling Essential Energy to maintain the quality, security, reliability and efficiency of its supply of standard control services.
6.5.7(a)(3) <i>the forecast capital expenditure maintains the quality, reliability, and security of supply of standard control services</i>	

The proposed investment addresses the NER “capital expenditure criteria” (NER 6.5.7(c)) as described below.

NER Capital Expenditure Criteria	Alignment
6.5.7(c)(1) (i) <i>the forecast capital expenditure reasonably reflects the efficient costs of achieving the capital expenditure objectives</i> (ii) <i>the forecast capital expenditure reasonably reflects the costs that a prudent operator would require to achieve the capital expenditure objectives</i> (iii) <i>the forecast capital expenditure reasonably reflects a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objective</i>	Investment costs have been calculated based on estimates derived from industry analysis, historical expenditure, and costed using standard labour rates. The costs have been further validated through comparison with the ADMS investment performed in the current RCP. This document is a preliminary business case for investment planning purposes. Prior to investment, the costs will be further validated in preparation of the final business case, informed through market engagement processes.

1.2. Corporate Strategy Alignment

The table below describes how the proposed investment supports Essential Energy’s business strategic themes.

Essential Energy strategic themes	Investment relationship to strategic themes
Network of the Future delivering the services customers want today and into the future	Distribution Power Flow (Load Flow Analysis) capability will enable the better management and modelling of the impacts of Distributed Generation and DER connecting to the electricity network. It will also form a foundation for adoption of more advanced power restoration capabilities.
Resilience and Reliability shaping our investment decisions consistent with a prudent risk appetite	Up to date ADMS capability will ensure resilience and reliability of Essential Energy’s electricity network.
Other Essential Services customer service and more	Keeping the ADMS current will enable improved system capabilities and support productivity improvements in the organisation leading to more effective outage management.

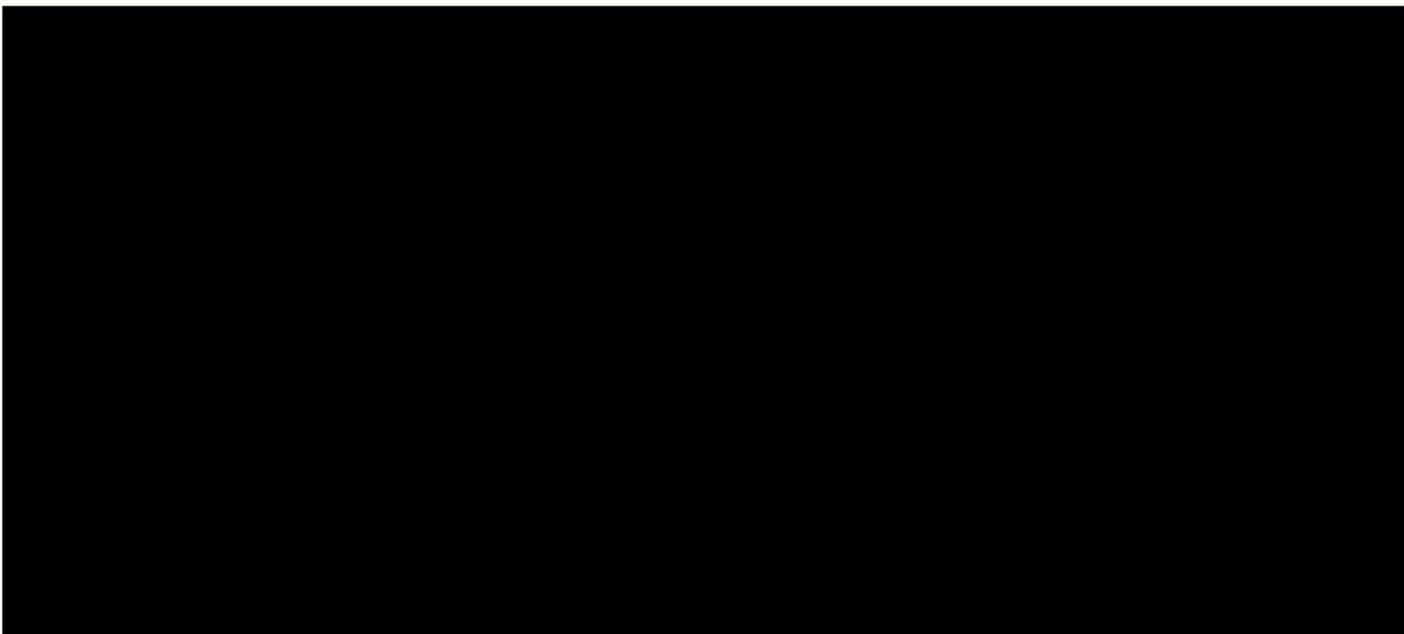
1.3. Current State

In the current RCP Essential Energy is migrating the ADMS from GE PowerOn Fusion v5.2 to GE PowerOn Advantage Series 6, including the GE PowerOn Mobile product-set.

The current RCP initiative will:

1. Replace the ageing “PowerOn Fusion” product with the newer generation “PowerOn Advantage Series 6” platform, supported by vendor and internal resources.
2. Mitigate existing risk of system unavailability through renewal of the underlying ADMS server infrastructure.
3. Improve system documentation assisting the ongoing supportability, security and sustainability of this “mission critical” system.
4. Improve ADMS security to mitigate cyber security vulnerability risks.
5. Improve Alarm Management by adopting the Australian Standard IEC 62682:2017- Management of Alarm Systems for Process Industries.

The graphic below depicts how the ADMS fits within the broader Operational Technology (OT) landscape.



1.4. Existing Issues

Long term system supportability and sustainability

Ensuring the ADMS is supported minimises system outage risks and the impact they may have to business operations. In the current RCP, prudent steps have been taken to migrate the ADMS to PowerOn Advantage ADMS Series 6. However, within the coming RCP, a further “mid-life” upgrade will be due.

Future network changes

Contemporary ADMS will accommodate future network changes enabling Essential Energy to safely and securely monitor and control it's network.

Data centre relocation

A planned data centre relocation will require the High Availability (HA) and Disaster Recovery (DR) capability of the ADMS to be re-architected to cater for this data centre move.

Load flow analysis

Presently, Load Flow Analysis and short-term network planning is performed in Siemens PSS SINCAL (SINCAL). SINCAL is a capable product, best used for planning horizons of 1-5 years. Having a suitable tool built in the ADMS, or directly using ADMS data, is more efficient and will enable near real time network modelling and scenario modelling. This would assist Essential Energy in understanding the impact of DER on network operations.

Integration reliability

Essential Energy may achieve further efficiencies in business operations by enhancing the integration with the ADMS. At present there is limited integration between GE PowerOn and other systems. Customer demand for new and evolving services (e.g. real-time outage data) may outpace the rate of integration achievable without continued investment.

Cyber security vulnerability

Critical infrastructure is an attractive target for cybercrime. Keeping the ADMS contemporary and supported is imperative to combat cyber security attacks.

1.5. Inherent Risks

The table below summarises the inherent risks requiring mitigation through this investment, with likelihoods forecast as at the end of the coming RCP (i.e., 30 June 2029) if no remedial actions are taken.

Inherent Risk	Likelihood	Consequence	Risk Rating	Risk Impacts
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

<p>[REDACTED]</p>	<p>[REDACTED]</p>	<p>[REDACTED]</p>	<p>[REDACTED]</p>	<p>[REDACTED]</p>
<p>[REDACTED]</p>	<p>[REDACTED]</p>	<p>[REDACTED]</p>	<p>[REDACTED]</p>	<p>[REDACTED]</p>
<p>[REDACTED]</p>	<p>[REDACTED]</p>	<p>[REDACTED]</p>	<p>[REDACTED]</p>	<p>[REDACTED]</p>

Table 1: Inherent Risks

		CONSEQUENCE				
		Insignificant	Minor	Moderate	Major	Severe
LIKELIHOOD	Almost Certain > 5 times within a year	Low	Medium	High	Extreme	Extreme
	Likely 1-5 times within a year	Low	Medium	High	High	Extreme
	Possible Once within 1-3 years	Low	Medium	Medium R1 R2	High	High
	Unlikely Once within 3-10 years	Low	Low	Medium R3 R4	Medium	High
	Rare Once within 10-100 years	Low	Low	Low	Medium	Medium
	Very Rare < Once within 100 years	Low	Low	Low	Low	Low

 Inherent Risks R1 to R4, with likelihoods forecast as at the end of the coming RCP mapped to the Essential Energy Risk Framework

Figure 1: Inherent Risks

2. Options Analysis

The following options have been considered to address the investment drivers.

Options Considered:	Assessment
Base Case	Continue to operate the existing ADMS, with minimal incremental investment.
Option 1: Upgrade the Advanced Distribution Management System (Recommended)	Undertake a “mid-life” upgrade of the ADMS providing a roadmap for future sustainability, compliance, and an enabler of productivity improvement through new capability and robust integration with Essential Energy systems.
Option 2: Migrate to a new Advanced Distribution Management System	Undertake a replacement of the ADMS with a new sustainable solution(s) that provide a roadmap for future compliance and productivity improvements, and robust integration to Essential Energy systems.

Table 2: Business Case Options

2.1. Base Case: Continue to operate the existing ADMS, with minimal incremental investment.

The base case represents a “counterfactual” assessment of Essential Energy’s likely expenditure if none of the proposed options proceed.

Without investment to replace or upgrade the existing ADMS, the issues identified in section 1.4 will not be addressed.

2.1.1 Assumptions – Base Case Option

The following assumptions apply for this option:

- Interim “work-arounds” or add-on solutions are implemented to manage the evolving requirements of the distribution network. This might include specific tools for DER Management (DERM), network modelling tools for protection and load, and/or requirements to address new or changed compliance obligations. Total cost of such workarounds is estimated at ██████ per year over five years.
- In this Base Case option, the ADMS is not renewed in the coming RCP (FY25-29). However, this does not allow the current version of the system to operate indefinitely into the future. Therefore, the upgrade investment would instead be undertaken in the following RCP, with assumed costs equivalent to those in Option 1 (in real terms).

2.1.2 Residual Risks – Base Case Option

The table below summarises the risk position at the end of the coming RCP (FY29) if the Base Case option is selected. Note that the risks included within this table, and the Inherent Risk ratings are as identified in section 1.5 (Page 8).

Inherent Risk at end-RCP (FY29) from business drivers - see section 1.5		Mitigated Risk for this Option I.e., residual risk			
Inherent Risk	Inherent Risk Rating	Mitigation	Likelihood	Consequence	Residual Risk Rating
████████████████████	● ██████	████████████████████	██████	██████	● ██████
████████████████████					

PRELIMINARY BUSINESS CASE – Advanced Distribution Management System Upgrade

[Redacted]	● [Redacted]	[Redacted]	[Redacted]	[Redacted]	● [Redacted]
[Redacted]	● [Redacted]	[Redacted]	[Redacted]	[Redacted]	● [Redacted]
[Redacted]	● [Redacted]	[Redacted]	[Redacted]	[Redacted]	● [Redacted]

Table 3: Residual Risks - Base Case Option

		CONSEQUENCE				
		Insignificant	Minor	Moderate	Major	Severe
LIKELIHOOD	Almost Certain > 5 times within a year	Low	Medium	High	Extreme	Extreme
	Likely 1-5 times within a year	Low	Medium	High	High	Extreme
	Possible Once within 1-3 years	Low	Medium	Medium R1 R2	High	High
	Unlikely Once within 3-10 years	Low	Low	Medium R3 R4	Medium	High
	Rare Once within 10-100 years	Low	Low	Low R3	Medium	Medium
	Very Rare < Once within 100 years	Low	Low	Low	Low	Low

- Rn Inherent Risks R1 to R4, with likelihoods forecast as at the end of the coming RCP mapped to the Essential Energy Risk Framework
- Rn Residual Risks R1 to R4 only shown if different to the Inherent Risk

Figure 2: Residual Risks - Base Case Option

PRELIMINARY BUSINESS CASE – Advanced Distribution Management System Upgrade

2.2. Option 1: Upgrade Advanced Distribution Management System (Recommended)

Through this option, Essential Energy will upgrade the ADMS (GE PowerOn and PowerOn Mobile), including improvements in Load Flow Analysis capability.

The ADMS will remain vendor supported and sustainable into the 2030s. Contemporary ADMS capabilities will aid in the management of an increasingly complex and dynamic electricity distribution network, including management of DER and renewable energy generation.

2.2.1 Assumptions – Option 1

The following assumptions apply for this option:

- The existing PowerOn Advantage ADMS Series 6 version (including PowerOn Mobile) will continue operating with current business processes until transition to the upgraded solution in FY28.
- The initiative will be delivered as a single project.

Advanced Distribution Management System				
Duration	Plan / Procure	3	Months	
	Design	4	Months	
	Construct / Test	8	Months	
	Deploy / Hypercare	3	Months	
	Total	18	Months	
Project Expenditure	\$M FY24 Real Terms	Capex	Opex	Totex
	Labour (Direct)	█	█	█
	Vendor Services	█	█	█
	Software & Hardware	█	█	█
	Total	█	█	█
Support Costs	\$M FY24 Real Terms	Opex p.a.		
	No net change	\$-		
	Total	\$ -		

Table 4: Assumptions – Option 1

2.2.2 Benefits – Option 1

The table below summarises the benefits enabled through selection of this option.

Benefit	Type and Value
Improved Distribution Power Flow Analysis will provide contemporary capability for Load Flow Analysis, what-if scenarios, and planning, enabling efficiency over the current practice of performing this planning and modelling in PSS SINCAL.	Contributor to Productivity Improvement Target and Quality of Service
Capability to accommodate network changes such as DER, residential batteries, and Electric Vehicles to meet the changing customer needs by keeping core technology platforms modern.	Quality of Service and compliance
Support the requirement to integrate, manage and control the impact of DER on the electricity network.	Quality of Service
Improved integration between the ADMS and Essential Energy systems supporting safety, customers and investment processes in addition gaining workflow efficiencies.	Contributor to Productivity Improvement Target and Quality of Service
Improved solution availability (HA) and faster DR timelines leading to increased organisational productivity.	Contributor to Productivity Improvement Target
Improved Quality of Service being delivered through an increased level of ADMS system stability, availability, and resilience.	Quality of Service and compliance
Financial cost avoidance associated with a major system outage.	Contributor to Productivity Improvement Target and Quality of Service

PRELIMINARY BUSINESS CASE – Advanced Distribution Management System Upgrade

Risk mitigation benefits (see section 2.2.3 below)	Non-Financial
--	---------------

Table 5: Benefits – Option 1

2.2.3 Residual Risks – Option 1

The table below summarises the risk position at the end of the coming RCP (FY29) if this option is selected. Note that the risks included within this table, and the Inherent Risk ratings are as identified in section 1.5 (Page 8).

Inherent Risk at end-RCP (FY29) from business drivers - see section 1.5		Mitigated Risk for this Option I.e., residual risk			
Inherent Risk	Inherent Risk Rating	Mitigation	Likelihood	Consequence	Residual Risk Rating
[Redacted]	● [Redacted]	[Redacted]	[Redacted]	[Redacted]	● [Redacted]
[Redacted]	● [Redacted]	[Redacted]	[Redacted]	[Redacted]	● [Redacted]
[Redacted]	● [Redacted]	[Redacted]	[Redacted]	[Redacted]	● [Redacted]
[Redacted]	● [Redacted]	[Redacted]	[Redacted]	[Redacted]	● [Redacted]

Table 6: Residual Risks – Option 1

PRELIMINARY BUSINESS CASE – Advanced Distribution Management System Upgrade

		CONSEQUENCE				
		Insignificant	Minor	Moderate	Major	Severe
LIKELIHOOD	Almost Certain > 5 times within a year	Low	Medium	High	Extreme	Extreme
	Likely 1-5 times within a year	Low	Medium	High	High	Extreme
	Possible Once within 1-3 years	Low	Medium	Medium R1 R2	High	High
	Unlikely Once within 3-10 years	Low	Low R1	Medium R3 R2 R4	Medium	High
	Rare Once within 10-100 years	Low	Low	Low R3 R4	Medium	Medium
	Very Rare < Once within 100 years	Low	Low	Low	Low	Low

Rn Inherent Risks R1 to R4, with likelihoods forecast as at the end of the coming RCP mapped to the Essential Energy Risk Framework

Rn Residual Risks R1 to R4 only shown if different to the Inherent Risk

Figure 3: Residual Risks – Option 1

2.2.4 Project Delivery Risks – Option 1

The table below summarises the project delivery risks associated with implementation of this option.

Inherent Project Risk	Inherent Project Risk	Controls	Residual Project Risk
Project Risk 1 Project Delivery Complexity ADMS Projects are inherently complex, with strict requirements, tolerances, and extensive testing requirements.	● High	In the current RCP, Essential Energy established strong program delivery governance and management practices which have successfully guided delivery of the Oracle ERP and EAM program. Similarly, the organisation has become skilled in delivery of ADMS projects including the current and past implementations of GE PowerOn Fusion, PowerOn Advantage and PowerOn Mobile. These same governance and delivery experience will be leveraged to mitigate the delivery risks associated with the planned ADMS upgrade in the coming RCP.	● Medium

PRELIMINARY BUSINESS CASE – Advanced Distribution Management System Upgrade

<p>Project Risk 2 Solution maturity</p> <p>When software solutions are relatively new in the release cycle there may be a greater number of software defects.</p>	<p> Medium</p>	<p>Choosing to upgrade to the latest version of GE PowerOn brings a low “maturity risk” as the product is already well established and used in other peer network businesses.</p>	<p> Low</p>
<p>Project Risk 3 Skills Availability</p> <p>The project will require a highly skilled delivery team, with knowledge and experience of network management processes, the software platform(s), legacy systems, and Essential Energy’s existing processes.</p> <p>Internal expertise will be limited in capacity, while external skills are reliant on market availability.</p>	<p> High</p>	<p>The project will be strictly planned, scheduled, and governed, consistent with the Enterprise Program Management Office (EPMO) practices which have matured through delivery of the ERP and EAM projects in the current RCP.</p> <p>Program and project plans will be scheduled to identify and minimise scarce resourcing conflicts.</p>	<p> Medium</p>
<p>Project Risk 4 Data migration complexities</p> <p>In significant upgrades there are generally a range of data issues which need to be resolved to upload into the new version of the solutions.</p>	<p> Medium</p>	<p>While data migrations for ADMS projects are inherently complex, the risk for this project will be quite low, given it represents the upgrade of an existing product.</p> <p>Factor adequate data conversion dress rehearsals into the project.</p>	<p> Low</p>
<p>Project Risk 5 Business change capacity</p> <p>Business change capacity is insufficient, and fatigue occurs.</p>	<p> Medium</p>	<p>Commit one or more key roles to the initiative, to ensure the best people are focussed on delivering an optimised solution.</p> <p>Minimise other less-critical parallel activity.</p> <p>Ensure an effective change and communications strategy is in place and regularly measure business readiness for change.</p> <p>Utilise technology for training and education and ensure achievement of minimum standards in using the new solution</p>	<p> Low</p>

Table 7: Project Risks - Option 1

2.3. Option 2: Migrate to a new Advanced Distribution Management System

Through this option, Essential Energy will undertake a competitive procurement process and replace the existing GE PowerOn platform with a new AMDS for long term sustainability, business process efficiency and cyber security. This new solution will be integrated with the broader Essential Energy systems.

While this option addresses the business drivers and mitigates the inherent risks similar to Option 1 (section 2.2), it introduces one or more new systems and integrations into the portfolio, with associated support implications.

2.3.1 Assumptions – Option 2

The following assumptions apply for this option:

- The existing ADMS will continue operating with current business processes, until transition to the new solution in the coming RCP. Existing support arrangements will continue without incremental cost increases until that time.
- The replacement AMDS will be selected through a market evaluation and formal procurement process, to ensure prudent and efficient project delivery and operations expenditure. The scale of this procurement activity will be materially greater than for Option 1, as available alternative software and service models will be evaluated.
- The initiative will be delivered as a coordinated project, incorporating Data Migration, User Acceptance Testing to ensure successful transition of critical systems capability.

Project 1: Meter, Market and Network Billing			
Duration	Plan / Procure	9	Months
	Design	9	Months
	Construct / Test	18	Months
	Deploy / Hypercare	6	Months
	Total	42	Months
Project Expenditure	\$M FY24 Real Terms	Capex	Opex
	Labour (Direct)	█	█
	Vendor Services	█	█
	Software & Hardware	█	█
	Total	█	█
Support Costs	\$M FY24 Real Terms	Opex p.a.	
	No net change, as new ADMS is assumed to have the same running costs as the existing PowerOn solution.	\$-	
	Total	\$0	

2.3.2 Benefits – Option 2

The table below summarises the benefits enabled through selection of this option. Financial benefits are provided as the “ongoing per annum (p.a.)” amounts which will be achieved following implementation of the investment.

Benefit	Type and Value
Ensures longer term sustainability (than Option 1) through undertaking a thorough evaluation of all solutions and service models available in the market.	Resilience and sustainability.

PRELIMINARY BUSINESS CASE – Advanced Distribution Management System Upgrade

Improved Distribution Power Flow Analysis will provide contemporary capability for Load Flow Analysis, what-if scenarios, and planning, enabling efficiency over the current practice of performing this planning and modelling in PSS SINCAL.	Contributor to Productivity Improvement Target and Quality of Service
Capability to accommodate network changes such as DER, residential batteries, and Electric Vehicles to meet the changing customer needs by keeping core technology platforms modern.	Quality of Service and compliance
Support the requirement to integrate, manage and control the impact of DER on the electricity network.	Quality of Service
Improved integration between the ADMS and Essential Energy systems supporting safety, customers and investment processes in addition gaining workflow efficiencies.	Contributor to Productivity Improvement Target and Quality of Service
Improved solution availability (HA) and faster DR timelines leading to increased organisational productivity.	Contributor to Productivity Improvement Target
Improved Quality of Service being delivered through an increased level of ADMS system stability, availability, and resilience.	Quality of Service and compliance
Financial cost avoidance associated with a major system outage.	Contributor to Productivity Improvement Target and Quality of Service
Compliance to NER requirements for maintenance and upgrade of core ICT systems and alignment with the corporate strategic plan.	Quality of Service
Risk mitigation benefits (see section 2.2.3 below)	Non-Financial

Table 8: Benefits – Option 2

2.3.3 Residual Risks – Option 2

The table below summarises the risk position at the end of the coming RCP (FY29) if this option is selected. Note that the risks included within this table, and the Inherent Risk ratings are as identified in section 1.5 (Page 8).

Inherent Risk at end-RCP (FY29) from business drivers - see section 1.5		Mitigated Risk for this Option i.e., residual risk			
Inherent Risk	Inherent Risk Rating	Mitigation	Likelihood	Consequence	Residual Risk Rating
[Redacted]	 [Redacted]	[Redacted]	[Redacted]	[Redacted]	 [Redacted]
[Redacted]	 [Redacted]	[Redacted]	[Redacted]	[Redacted]	 [Redacted]

PRELIMINARY BUSINESS CASE – Advanced Distribution Management System Upgrade

[REDACTED]	● [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	● [REDACTED]
[REDACTED]	● [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	● [REDACTED]

Table 9: Residual Risks – Option 2

		CONSEQUENCE				
		Insignificant	Minor	Moderate	Major	Severe
LIKELIHOOD	Almost Certain > 5 times within a year	Low	Medium	High	Extreme	Extreme
	Likely 1-5 times within a year	Low	Medium	High	High	Extreme
	Possible Once within 1-3 years	Low	Medium	Medium R1 R2	High	High
	Unlikely Once within 3-10 years	Low	Low R1	Medium R3 R2 R4	Medium	High
	Rare Once within 10-100 years	Low	Low	Low R3 R4	Medium	Medium
	Very Rare < Once within 100 years	Low	Low	Low	Low	Low

- Rn Inherent Risks R1 to R4, with likelihoods forecast as at the end of the coming RCP mapped to the Essential Energy Risk Framework
- Rn Residual Risks R1 to R4 only shown if different to the Inherent Risk

Figure 4: Residual Risks – Option 2

PRELIMINARY BUSINESS CASE – Advanced Distribution Management System Upgrade

2.3.4 Project Delivery Risks – Option 2

The table below summarises the project delivery risks associated with implementation of this option.

Inherent Project Risk	Inherent Project Risk	Controls	Residual Project Risk
<p>Project Risk 1 Project Delivery Complexity</p> <p>ADMS Projects are inherently complex, with strict requirements, tolerances, and extensive testing requirements.</p>	<p>● High</p>	<p>In the current RCP, Essential Energy established strong program delivery governance and management practices which have successfully guided delivery of the Oracle ERP and EAM program.</p> <p>Similarly, the organisation has become skilled in delivery of ADMS projects including the current and past implementations of GE PowerOn Fusion, PowerOn Advantage and PowerOn Mobile.</p> <p>These same governance and delivery experience will be leveraged to mitigate the delivery risks associated with the planned ADMS upgrade in the coming RCP.</p> <p>Nonetheless, given this project will transition from a known product-set (GE PowerOn) to a new ADMS product, the residual project risk remains medium.</p>	<p>● Medium</p>
<p>Project Risk 2 Solution maturity</p> <p>When software solutions are relatively new in the release cycle there may be a greater number of software defects.</p>	<p>● Medium</p>	<p>A significantly weighted criterion in selection of a new ADMS would include the maturity and deployment track record for the product.</p> <p>Therefore, the maturity risk is lower than it otherwise could be.</p>	<p>● Low</p>
<p>Project Risk 3 Skills Availability</p> <p>The project will require a highly skilled delivery team, with knowledge and experience of network management processes, the software platform(s), legacy systems, and Essential Energy’s existing processes.</p> <p>Internal expertise will be limited in capacity, while external skills are reliant on market availability.</p>	<p>● High</p>	<p>The project will be strictly planned, scheduled, and governed, consistent with the Enterprise Program Management Office (EPMO) practices which have matured through delivery of the ERP and EAM projects in the current RCP.</p> <p>Program and project plans will be scheduled to identify and minimise scarce resourcing conflicts.</p>	<p>● Medium</p>
<p>Project Risk 4 Data migration complexities</p> <p>In significant upgrades there are generally a range of data issues which need to be resolved to upload into the new version of the solutions.</p>	<p>● High</p>	<p>Data migrations for ADMS projects are inherently complex.</p> <p>The risk for this project remains high, given the transition from an existing known product (GE PowerOn) to a new ADMS solution.</p>	<p>● High</p>
<p>Project Risk 5 Business change capacity</p> <p>Business change capacity is insufficient, and fatigue occurs.</p>	<p>● Medium</p>	<p>Commit one or more key roles to the initiative, to ensure the best people are focussed on delivering an optimised solution.</p> <p>Minimise other less-critical parallel activity, and ensure an effective change and communications strategy is in place and regularly measure business readiness for change.</p> <p>Utilise technology for training and</p>	<p>● Medium</p>

PRELIMINARY BUSINESS CASE – Advanced Distribution Management System Upgrade

		<p>education and ensure achievement of minimum standards in using the new solution.</p> <p>Despite these prudent mitigations, the residual risk remains medium, given the change in work practices which may result from transition to a new ADMS solution.</p>	
--	--	---	--

Table 10: Project Risks - Option 2

3. Financial Comparison

The table below provides a comparison of the Net Present Value (NPV) for each option.

Option	NPV
Base Case	██████
Option 1: Upgrade the Advanced Distribution Management System (Recommended)	██████
Option 2: Migrate to a new Advanced Distribution Management System	██████

Table 11: Financial NPV Comparison

The above NPV comparison has been performed using the NPV calculation workbook, with the following parameters.

- Discount Rate: 2.74% (Post-tax Real)
- Company Tax Rate: 30%
- Investment Modelling Period: 10 Years
- Asset Life: 7 years

4. Dependencies

Project Name	Nature of Dependency
Cyber Security IPART DNSP Licence Compliance Project	In the remainder of the current RCP, Essential Energy is finalising implementation of the Cyber Security technology and practice improvements required for compliance with the company’s revised Distributor Licence Conditions. The AMDS project would benefit from the delivery and bedding down of this project.
Spatial Network Model Management Renewal	The existing AMDS interfaces with the GE Smallworld Geographic Information System (GIS) for connection point mapping, to support life support processes. The current GE Smallworld platform requires lifecycle renewal in the early part of the coming RCP.
Network of the Future Strategy	The Network of the Future Strategy is dependent on sustainable ADMS capability, including the improvements in Load Flow Analysis to enable efficient integration of DER within the network.

Table 12: Project Dependencies

5. Organisational Change Impacts

A stakeholder assessment and impact analysis will detail the groups/roles impacted (internal and external), the nature of the change and the level of impact. The impact assessment will articulate the change in the following dimensions for each stakeholder grouping.

- **Process:** Procedures, work practices, reference guides, work instructions, operating guides
- **Organisation:** Accountabilities, reporting lines, position profiles, KPIs, behaviours/cultural attributes
- **Technology:** Systems, infrastructure, tools, support resourcing and contracts
- **Information:** Data and reporting

The impact assessment informs the interventions required, with tailoring to suit the nature of the change and the stakeholder groupings – a “one size fits all” approach is not appropriate.

The table below summarises the key impact areas for the proposed investment.

Business Area	Nature of Impact
Network Operations Staff	Participation in system and process design. Training for upgraded ADMS, new capability and redesigned work practices.
IT Support Teams	Transition to supporting the new version of the ADMS.

Table 13: Organisational Change Impacts

6. Conclusion

The preceding sections of this preliminary business case summarise the business drivers for investment, the options to address those drivers, and the corresponding likely costs, benefits, risks and impacts.

On this basis, the recommended option (“Option 1 - Upgrade the ADMS”) is proposed for the purposes of organisational planning and forecasting.

Consistent with Essential Energy’s investment governance processes, prior to proceeding with the proposed investment a detailed delivery business case will be developed and evaluated.

ATTACHMENT 1: Glossary of Terms

The following terms or abbreviations are used within this document.

Term	Description
aaS	As a Service
ALM	Asset Lifecycle Management
Capex	Capital Expenditure
DBMS	Database Management System
DNSP	Distribution Network Service Provider
EAM	Enterprise Asset Management
EPMO	Enterprise Program Management Office
ERP	Enterprise Resource Planning [System] including Financial Management and Supply Chain Management.
GIS	Geographic Information System
IaaS	Infrastructure as a Services
ICT	Information & Communication Technology
KPI	Key Performance Indicator
NEM	National Electricity Market
NER	National Electricity Rules
NPV	Net Present Value
Opex	Operating Expenditure
PaaS	Platform as a Service
RCP	Regulatory Control Period
SaaS	Software as a Service
SME	Small Medium Enterprise
Totex	Total Expenditure (Capital + Operating)