AusNet

Electricity Distribution Price Review FY2027 to FY2031 (EDPR 2027-31)

Business case: Advanced Distribution Management System (ADMS)

Date: January 2025

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Document history

DATE	VERSION	COMMENT
29/09/2024	V1.0	Initial draft business case for review
24/10/2024	V2.0	Updated draft incorporating review input
01/12/2024	V3.0	Revised business case for SME review
31/12/2024	V4.0	Final business case document

Related documents

DOCUMENT	VERSION	AUTHOR
Field Enablement Business Case	V4.0	AusNet Services
Network Model Management Business Case	V3.0	AusNet Services
Technology Strategy and Investment Plan	V3.0	AusNet Services
AusNet Resilience Strategy	V3.0	AusNet Services
AusNet EDPR 2027-31 Digital Program NPV model	V3.0	AusNet Services

Approvals

POSITION	DATE
Digital & Technology – Strategy, Regulatory and Partner Management	December 2024
Digital & Technology – Architecture	December 2024
Distribution – Strategy and Regulation	December 2024

1. Executive summary

At AusNet, our Customer Energy Operations Team (CEOT) is at the core of our operations as a Distribution Network Service Provider (DNSP). As the electricity distribution landscape continues to change, our control room operations must adapt to ensure we can continue to provide an efficient reliable, high-quality power supply service for our customers into the future.

During our last Electricity Distribution Price Review (EDPR) we identified the need to implement an Advanced Distribution Management System (ADMS) platform to provide AusNet with the necessary capabilities for managing our distribution network in a rapidly evolving landscape. The AER approved $30 million ($ real 2019) for the initial phases of ADMS implementation, to provide a platform to progressively integrate new functionality and capabilities over time as AusNet and the energy landscape continues to evolve.

We have made significant progress in implementing a new ADMS platform during the current regulatory period. The program has successfully implemented a core set of ADMS foundation capabilities that will enable us to progressively add advanced functionality to further enable dynamic operation and management of the network to deliver improved customer outcomes.

Looking ahead, new capabilities and system functionality are required to enable AusNet to effectively manage key issues and drivers facing our network. These include:

- Increasing penetration of renewables on a grid originally designed and built for large scale one-way power flows is creating challenges in keeping energy supply and demand in balance and ensuring frequency and voltage levels remain within operating limits.

- Increased frequency of extreme weather events, reduced base load generation, rapid technological change, evolving market players, and changing customer/regulator expectations are increasing the complexity in how we must operate and manage our network.

- The lack of integration between our ADMS and SCADA systems is becoming a more challenging issue as the complexity of the network increases, which over time decreases the responsiveness of our control room and can lead to more Human Error Incidents (HEIs).

- Greater workload and therefore stress on our controllers may hinder employee performance and retention, and therefore put the continuity of our capabilities and effective operation of the network at risk.

- The need to improve outage management and communication capabilities as identified from recent external and internal reviews including the Victorian Government's Network Resilience Review[1], the Victorian Government's Network Outage Report[2] and our internal Post Incident Report following the February 2024 storms that was conducted by Nous.

This business case details the need to continue our ADMS implementation program by delivering enhanced network operations and grid optimisation capabilities through the delivery of Phase 3 and 4 in our ADMS roadmap. The continuation of updating AusNet's ADMS capability is necessary to address current limitations and issues identified with the current systems that have impacted service level outcomes and customer experience, as evidenced by the February 2024 storms major event.

Capabilities and enhanced system functionality to be delivered by Phase 3 and 4 of the ADMS roadmap will better position AusNet to more effectively and efficiently operate a complex and dynamically changing distribution network, better integrate and support the uptake of DER, meet customer information needs, and reduce restoration timeframes.

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[1] Electricity Distribution Network Resilience Review, Final Recommendations Report, May 2022
[2] Network Outage Review, Independent review of Transmission and Distribution Businesses Operational Response, Final report, September 2024

This business case assessed the following three options for delivering required capabilities, as shown below:

OPTION	SUMMARY
Option 1: Maintain existing systems, augment with task specific systems	Maintain the existing systems and any new functionality required will be addressed with new task specific packages that may be from different vendors.
Option 2: Maximise use of existing systems with upgrades.	Fully leverage existing systems to deliver new functionality through upgrading existing modules or adding new modules from the existing vendor and software environment.
Option 3: Implement a new platform that addresses all needs	Replace all relevant systems with a new single software platform that will provide all required new functionality.

Each of the assessed options deliver the required ADMS functionality and capability. However, the degree to which the options prudently and efficiently meet the identified need and address identified capability gaps varies. Consequently, options have been assessed based on the extent to which they address identified capability gaps, met customer expectations, address assessed risks from application of AusNet's Enterprise Risk Management Framework, and are deliverable within the regulatory period.

A quantitative cost benefit assessment was also undertaken for each of the options, that considered the improved customer outcomes, network operations performance, and AusNet business efficiencies, relative to the capital cost to implement the program under the three different system architecture options.

Our analysis has found that Option 2 is our preferred option as it provides the highest, and only positive, NPV and will result in reduced cost to our customers while meeting customer expectations. Option 2 is also the only option that fully addresses all the capability gaps identified with our network operations, exposes AusNet to the least risk, best supports the achievement of AusNet's customer commitments of improving resilience and service outcomes, and enables AusNet complete the implementation of our ADMS roadmap, as accepted by the AER at the 2021-26 determination. The results of our analysis are shown in Table 1 below.

Table 1 – Options analysis summary

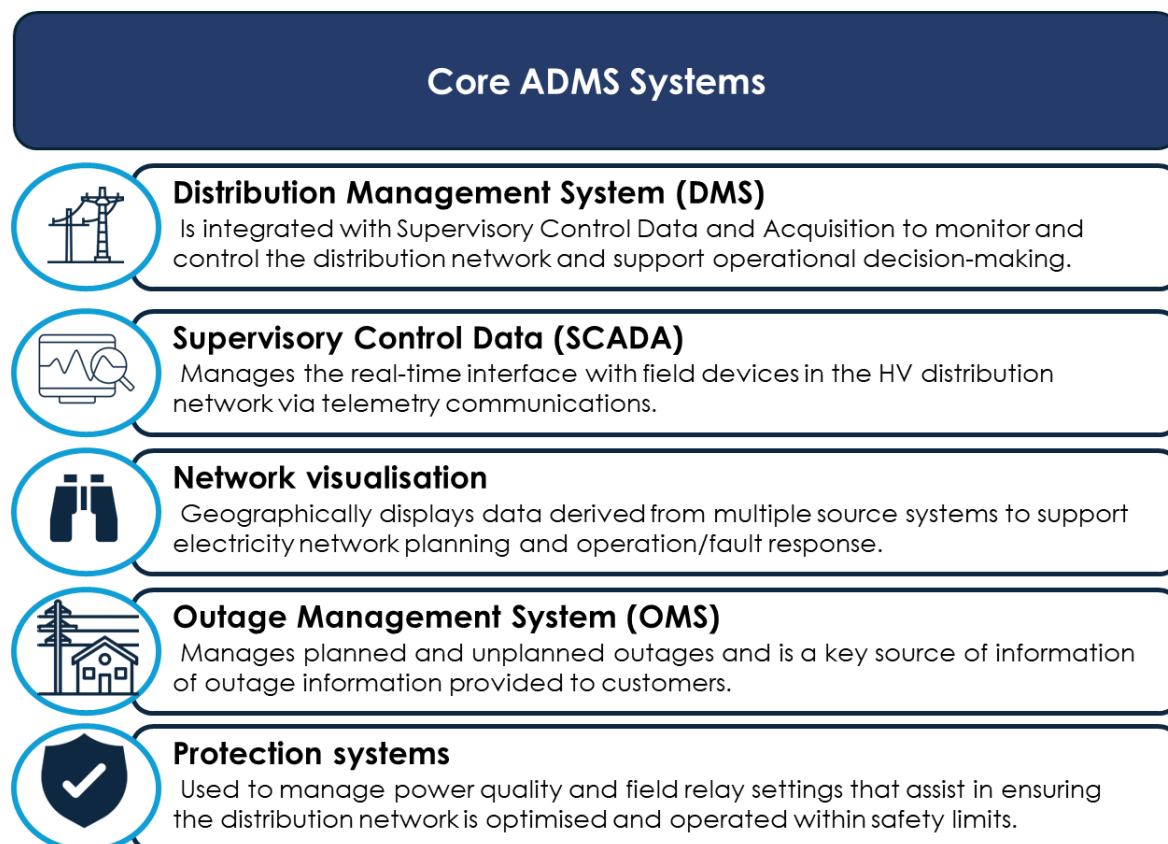| Criteria	Option 1	Option 2	Option 3
NPV ($'000, real FY24)	-$15,220	$3,687	-$53,580
Capex ($'000, real FY24)	$67,344	$60,394	$109,394
Opex ($'000, real FY24)	$17,247	$15,857	$19,147
Technically feasible	✓	✓	✓
Addresses identified need	✗ (Partial)	✓	✓
Meets customer expectations	✗ (Partial)	✓	✓
Deliverable within timeframe	✓	✓	✗
Delivery risk	Moderate	Low	High
Preferred option	✗	✓	✗

2. Context

2.1. Background

In 2020 AusNet embarked on a multi-year and multi-phase program to implement an Advanced Distribution Management System (ADMS). The ADMS provides a modern, integrated, digital platform to enable AusNet to meet the challenges of operating and managing a dynamic and complex grid, characterised by the increased uptake of renewables and increased frequency and severity of extreme events from climate change.

As an electricity distributor, we are required to ensure a reliable electricity supply in accordance with the Distribution Code. Our customers expect us to provide safe, dependable, flexible, and affordable electricity supply. During our last Electricity Distribution Price Review (EDPR) we identified the need to implement an ADMS platform to provide AusNet with the necessary capabilities for managing our distribution network in a rapidly evolving landscape. The recommended option in our Future Distribution Network Management Business Case was to implement an ADMS platform that could progressively integrate capability for Distributed Energy Resource Control/Optimisation, demand response, and facilitate and control (where applicable) peer-to-peer trading.

ADMS provides an integrated set of tools to remotely monitor and control the network, manage system outages, improve planned and emergency event management, optimise power-flow management, fault location analysis, and fault isolation and restoration capabilities. It also enables integration of distributed energy resources and network optimisation capabilities. In its final determination, the AER approved $30 million ($ real 2019) for the initial phases of implementation of ADMS.

Our ADMS is comprised of several core systems that are currently provided by a single vendor, [CIC   ] to ensure integration across the systems as illustrated by Figure 1 below.

Figure 1 – Overview of AusNet's core ADMS systems

Core ADMS Systems

Distribution Management System (DMS)
Is integrated with Supervisory Control Data and Acquisition to monitor and control the distribution network and support operational decision-making.

Supervisory Control Data (SCADA)
Manages the real-time interface with field devices in the HV distribution network via telemetry communications.

Network visualisation
Geographically displays data derived from multiple source systems to support electricity network planning and operation/fault response.

Outage Management System (OMS)
Manages planned and unplanned outages and is a key source of information of outage information provided to customers.

Protection systems
Used to manage power quality and field relay settings that assist in ensuring the distribution network is optimised and operated within safety limits.

2.2.   Implementation approach

In 2020 we developed a long-term roadmap to implement an ADMS. Our ADMS roadmap is comprised of four phases, as shown in Figure 2 below. These include to progressively investigate options, undertake design, implement foundational elements and then enhanced operations:

- Phase 1 involved market research and an in-depth vendor tender process to identify the product and platform that best suited AusNet's needs.

- Phase 2 focused on establishing foundational changes to support the implementation of ADMS including upgrades to the existing [CIC] platform and new systems that are required to enable a low-risk transition to the new [CIC] platform.

- Phases 3 onwards is aimed at transferring across, upgrading, or deploying new functionalities. As indicated in Figure 2, delivery of Phase 3 will commence during the current regulatory period and continue through to completion in the 2027-31 regulatory control period.

Adopting a phased approach, predicated on the establishment of a core set of ADMS capability, has been designed to enable AusNet to start realising benefits as new functionality is added to the system. Careful consideration has been given to ensure the optimal sequencing and packaging of functionality to support benefit realisation, whilst also providing flexibility to respond to changes in network needs, technology development or other project constraints without being locked into a fully pre-designed system.

To support the prudent and efficient implementation of ADMS, AusNet has established the Energy and Network Portfolio and Steering Committee to oversee the program of work of modernising AusNet's systems. The committee meets on a regular schedule and is tasked with tracking expenditure and monitoring delivery of the project against the expenditure and milestones. The committee is also responsible for review and approval of projects through their development stage to commissioning, including ensuring and project variations are prudent.

Figure 2 Overview of ADMS roadmap
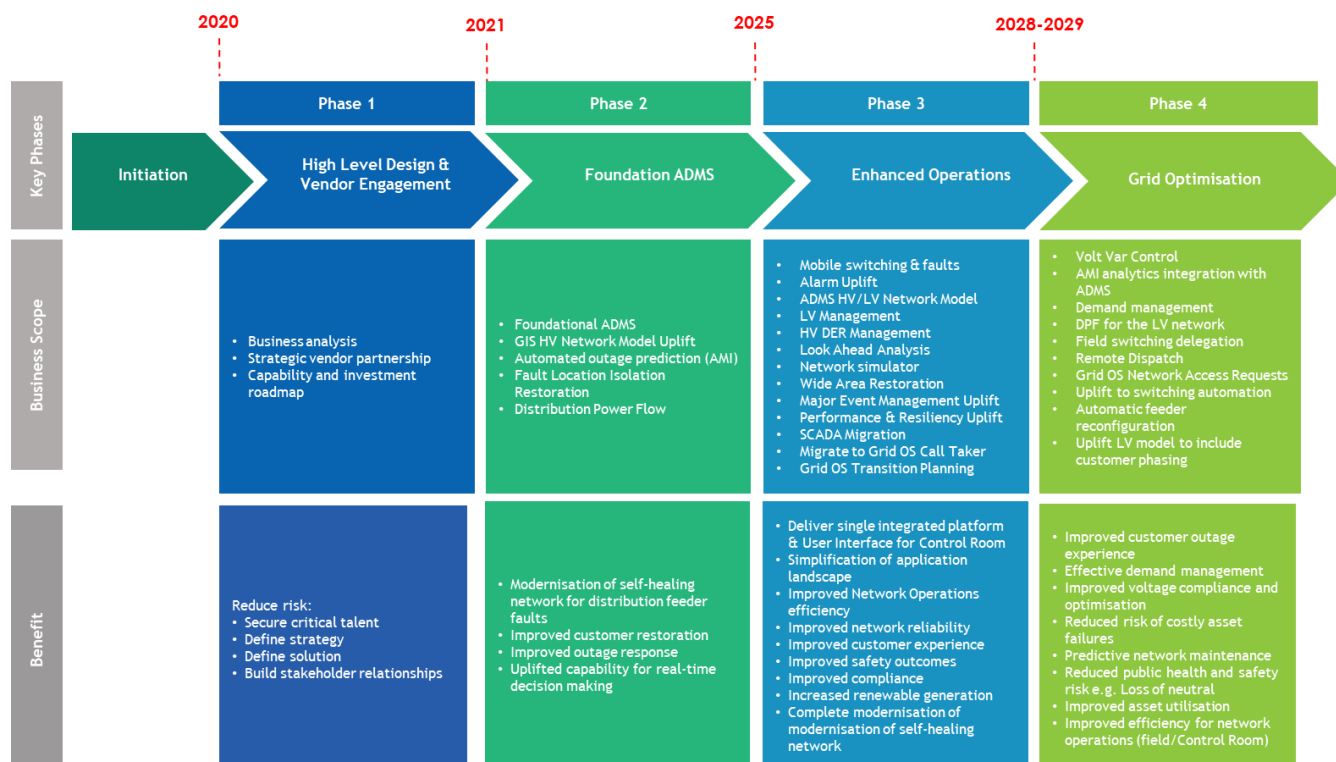
2.3. Progress to date

The implementation of the ADMS is progressing to schedule with the initiation, Phase 1 and Phase 2 completed as at end-2024. During the remainder of the FY2021-26 period, Phase 3 will be commenced with completion during the FY2027-31 regulatory period. Phase 4 is planned to commence during the FY2027-31 regulatory control period. A summary of work undertaken (or to be undertaken) under each implementation phase is summarised below.

Initiation

The implementation of ADMS drew from a body of strategic work to define objectives, scope and program outcomes including the 2018 CEOT of the Future, 2019 McKinsey Company Review, 2020 Digital Utility Strategy, 2020 Spatial Strategy, 2021 DER Roadmap, and FY20 Electricity Distribution Business Plan.

Phase 1 – high level design and vendor engagement

During Phase 1 a rigorous market research, testing, and tendering process was undertaken. This involved analysis of the key ADMS providers and ADMS capabilities that have been implemented, or are planned to be implemented, by peer DNSPs to help determine which vendor and scope of capabilities would be prudent for AusNet to implement.

[

CIC

]

The market research and analysis of peers also examined the capabilities and functionality being deployed by other DNSPs. This provided guidance on the maturity of different elements of the ADMS that are planned to be deployed by AusNet. As shown in Figure 3 all functionalities that are planned for deployment by AusNet will have already been deployed by other DNSP which helps de-risk the project and allows AusNet to benefit from other DNSPs learnings.

Figure 3 - Peer DNSP ADMS functionalities deployed (as per 2024 market scan)

[

CIC

]

Based on the key vendor analysis, AusNet decided to continue the tender process with [CIC   ] and [CIC   ]. [CIC   ] was rejected as it was the product with the least alignment with the functionality AusNet required. This allowed AusNet to focus on only two vendors in the in-depth analysis of potential ADMS providers and therefore achieve a better overall outcome in terms of the final product and minimising implementation risk.

[CIC   ] was found to have the better overall product and approach to delivery. In addition, retaining the same vendor mitigated some implementation risk. Key benefits from Phase 1 included:

- Analysis of multi-criteria across functional and non-functional capabilities, delivery, strategic partnership and solution design found that [CIC   ] was overall the best fit for AusNet's functional needs.
- Some specific gaps in functionality in the [CIC   ] solution were found to increase risk in terms of time and cost to resolve the gaps.

- Retaining the same vendor (given no material difference between the platforms) provided significant risk reduction benefits.

- [CIC] provided a greater level of flexibility around the approach to deployment and customisation, whereas [CIC] was more rigid in their approach and solution.

The vendor selection and business case for Phase 2 delivery scope of work were key outputs of Phase 1.

Phase 2 – ADMS foundation

The focus of Phase 2 was establishing the foundational elements of the new ADMS platform and involved several upgrades to the current platform and implementing enabling systems. This effectively allowed AusNet to transition from the current [CIC] platform to [CIC], which is a necessary interim step in the process of transitioning to the full [CIC] platform (new ADMS system) in a manner that is efficient and mitigates AusNet's risk exposure.

Phase 2 was split into two sub phases (A and B) for implementation and will be complete by the end of 2024 calendar year. During this phase there were several optimisations to expedite deployment of systems and deferral of others to suit network need and reflect dependencies in product development.

Benefits of Phase 2 were improved:

- network outage management resulting in improved fault management and restoration times

- business process simplification resulting in avoided costs

- savings related to GE maintenance and support

- avoided need to develop [CIC] where the required capabilities are available in [CIC]

- resourcing savings and reduced cyber risk from technical obsolescence of systems.

Table 1 – ADMS capabilities implemented during Phase 2A

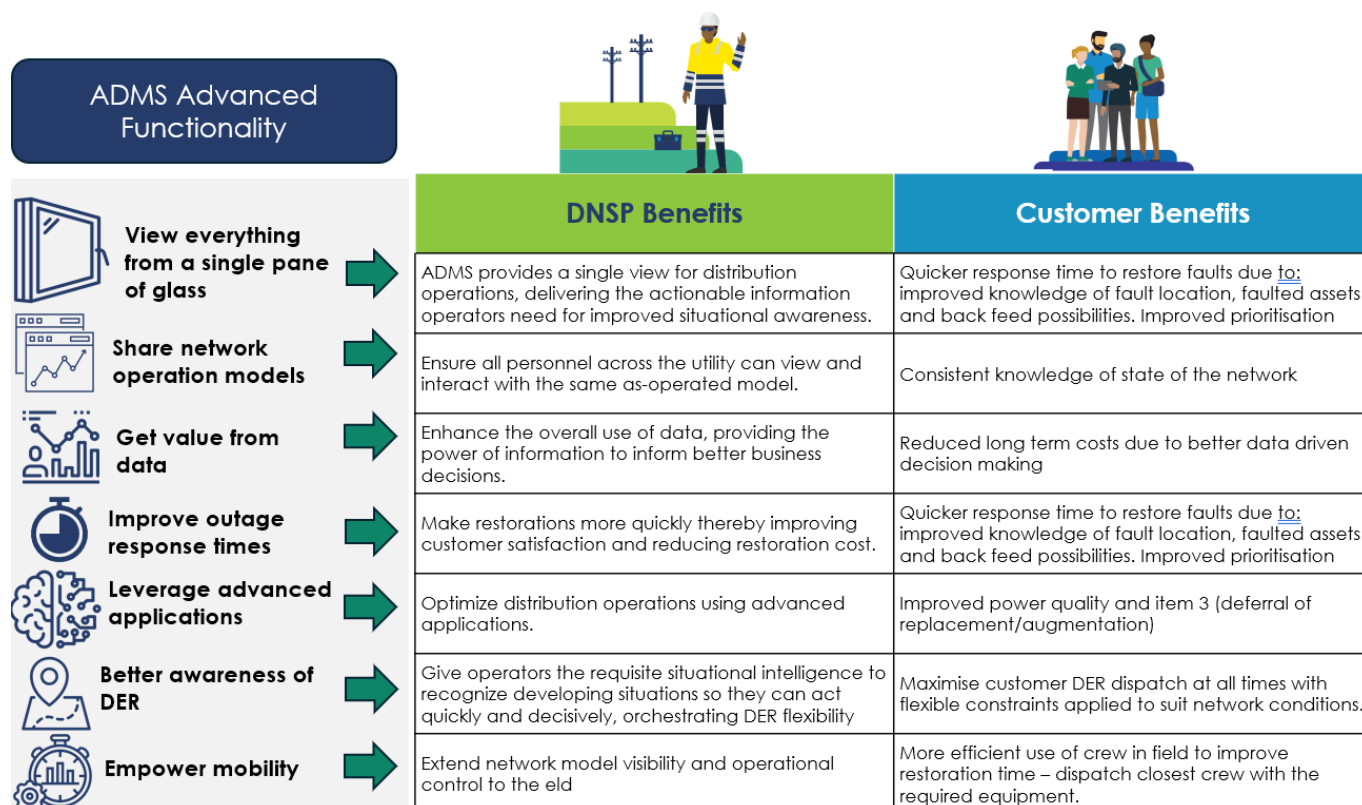| Scope items	Description	Status
Power On Advantage (ADMS) Upgrade	Upgrade from [CIC] to [CIC], including new production and non-production infrastructure.	Complete
Incident Nesting	Improved presentation and tracking of outages.	Complete
Realtime Dashboards	Built-in ADMS dashboards available to ADMS users. Dashboards will present insights from ADMS to support situational awareness for core processes.	Complete
Automated IVR Integration	Automate the messaging between ADMS and the IVR to remove manual handling.	Complete
SDMe Upgrade	Upgrade SDMe from [CIC]. GIS Adapter will be upgraded from [CIC].	Complete
DnA Rearchitected	Modification to existing interfaces with AusNet's Data and Analytics (DnA) platform to provide access to ADMS data	Complete
MAIFIMON, ACRMON migrated to [CIC] from SCADA	Part of moving control schemes into [CIC] from SCADA in readiness to switch off SCADA in a future initiative.	Complete
AMI Meter Bulk Pings	Enables up to 2000 meters to be pinged. Prior the control room could only ping 1 meter.	Complete
NEXOS Switching Instruction Interface	Reengineer the NEXOS switching instruction interface, automating the creation of switching instructions in PoA.	Complete
Guaranteed Service Level (GSL) Automation	Process improvement and automating elements of the GSL process that are currently undertaken manually in [CIC]	Complete

Table 2 – ADMS capabilities implemented during Phase 2B

Scope items	Description	Status
Realtime Outage Prediction using AMI data	Integrate last gasp and power up AMI meter events & enhance ping capability.	Complete
Fault Location Isolation and Service Restoration (FLISR) on 6 HV Feeders pilot then deploy	Native ADMS Fault Location Isolation and Service Restoration solution to automatically isolate faults, and restore customer supply, based on real time network state and power flow studies.	Complete
Distribution Power Flow on 2 ZSS	Perform power flow studies on the high voltage distribution feeders. Provide improved situational awareness of the distribution feeders.	Complete
Network Model Data in GIS	Remediated and augmented the Asset and Network Connectivity data for HV in GIS	Complete
New SDMe (GIS) capability	Enhanced GIS capability to provide CIM files to create and maintain the HV and Sub-transmission Network model in ADMS	Complete
HV Data in GIS	HV Network Model established in GIS. HV data augmented to support Fault Location Isolation and Service Restoration and network views.	Deferred to Phase 3
Geospatial Views	ADMS geo-schematic and geospatial network displays with real time data overlays including weather and fire data indexes.	Deferred to Phase 3
Wide Area Restoration (PORT) for 2 zone substations pilot then deploy	Native ADMS Fault Location Isolation and Service Restoration solution to automatically restore customer supply, for zone substation and sub-transmission outages. Ability to generate complex network switching to maximise switching solutions.	Deferred to Phase 3

Phase 3 and 4 – enhanced ADMS and grid optimisation capabilities

Phases 3 and 4 are aimed at building further on the ADMS foundation capabilities implemented during Phase 2 to deploy more advanced ADMS and grid optimisation capabilities. The key benefits that will be delivered from undertaking this work are summarised in Figure 4 below.

Figure 4 – Summary of key ADMS benefits to be delivered by Phase 3 and 4

ADMS Advanced Functionality	DNSP Benefits	Customer Benefits
View everything from a single pane of glass	ADMS provides a single view for distribution operations, delivering the actionable information operators need for improved situational awareness.	Quicker response time to restore faults due to: improved knowledge of fault location, faulted assets and back feed possibilities. Improved prioritisation
Share network operation models	Ensure all personnel across the utility can view and interact with the same as-operated model.	Consistent knowledge of state of the network
Get value from data	Enhance the overall use of data, providing the power of information to inform better business decisions.	Reduced long term costs due to better data driven decision making
Improve outage response times	Make restorations more quickly thereby improving customer satisfaction and reducing restoration cost.	Quicker response time to restore faults due to: improved knowledge of fault location, faulted assets and back feed possibilities. Improved prioritisation
Leverage advanced applications	Optimize distribution operations using advanced applications.	Improved power quality and item 3 (deferral of replacement/augmentation)
Better awareness of DER	Give operators the requisite situational intelligence to recognize developing situations so they can act quickly and decisively, orchestrating DER flexibility	Maximise customer DER dispatch at all times with flexible constraints applied to suit network conditions.
Empower mobility	Extend network model visibility and operational control to the eld	More efficient use of crew in field to improve restoration time – dispatch closest crew with the required equipment.

AusNet has already designed and scoped elements of Phase 3 and has commenced work as at the end of 2024 to start delivering scope items. Table 4 below describes the Initiatives and a description of the capability they will provide. The actual sequence and prioritisation of the initiatives in Phase 3 will be determined based on network need as the project continues to be delivered and network needs evolve.

Phase 4 will be initiated during the FY2027-31 regulatory period to complete the transition to [CIC] and implement additional functionality and capabilities required to manage the network as it becomes increasingly more complex. Key drivers for the need for additional functionality include the transition to renewables, two-way electricity flows, customer expectations for increasing reliability and resilience, customer expectations for accurate and timely outage information, and the need more improved network planning capabilities.

Table 3 - Systems implemented during Phase 3

Initiatives	Description
[CIC] Upgrade	Technical upgrade of [CIC] to the latest version, to provide the latest foundation for all enhanced capabilities.
Alarm Improvements	Rationalise alarms for improved Distribution network monitoring and control.
OT Performance	Remediate existing OT performance issues across ADMS, SCADA, ICCP and associated infrastructure and ensures the OT environment can support the Phase 3 scope.
Wide Area Restoration and WAR Rollout	Enables automated Wide Area Restoration for zone substation faults and decommissioning of the custom Distribution Feeder Automation (DFA) product including DFA Zone Sub black.
HV DER Management	Enables dynamic constraint management for HV generator connections e.g. solar farms, wind farms, and batteries.
[CIC] Transition (Arch & Planning)	Plan for full transition to [CIC] platform that will replace [CIC] legacy ADMS system currently used by AusNet.
Storm Readiness	Provide outage volume predictions by area based on historical outages and weather data. Visualisation of weather combined with outage predictions overlaid onto the network diagram.
OT Resilience	Provide ADMS Lite production backup to enable business continuity in the event primary and secondary data centres are both unavailable.
SCADA Migration	Migrate Distribution SCADA and associated custom scripts to core ADMS native SCADA. Simplify environment and enable closer interoperability of ADMS modules that require SCADA, e.g. Fault Location Isolation and Service Restoration, WAR, ANM.
Establish Evergreen 'Lite" Pipeline Upgrade Capability (Deployment/Testing Automation)	Automation of possible testing suites to reduce time involved in testing, and prepare for containerisation. Establish BAU capability to enable regular cadence of technical version upgrades, rather than substantive upgrades every 5 years.
Custom Scripts	Migrate ~160 custom scripts to ADMS core product (reduces operational risk, and removes technical debt)
Network Simulator	Enables network events to be simulated to support controller training and system testing of advanced modules, e.g. DPF, Fault Location Isolation and Service Restoration and PORT.
[CIC] Forecasting	Computes forecasts of electrical load and electrical renewable generation (MW). Enables multi-interval power flows and look ahead capability for real time decision making.
[CIC] Migration to [CIC]	Commence transition to [CIC]'s future platform [CIC] platform, that will replace [CIC] and associated modules. [CIC] to run in parallel with [CIC].

2.4. Investment in the 2021-26 regulatory period

Recognising that the ADMS program has already commenced in the current regulatory period, the actual and forecast expenditure for delivering Phase 1 and 2, and commencing Phase 3, are shown in Table 4.

Following the challenges encountered during the February 2024 storms and subsequent external and independent reviews, AusNet accelerated the delivery of elements of the ADMS program related to network control and outage management. This acceleration is reflected in the CY2024 spend, and the forecasts for CY2025 and 2026. AusNet considers this acceleration a prudent response to the issues identified and to meet the expectations of our customers for network reliability, and demonstrates the approach taken and ability to reprioritise expenditure as required to address business needs as they arise.

Table 4 – Summary of ADMS expenditure ($ nominal)

Calendar year	CY2021	CY2022	CY2023	CY2024	CY2025	CY2026	Total
Basis	Actual	Actual	Actual	Actual	Forecast	Forecast	**Forecast**
Capex	$0.2m	$3.6m	$17.6m	$12.7m	$14.2m	$21.7m	$70.0m
Opex	-	-	-	-	-	-	-
Total	$0.2m	$3.6m	$17.6m	$12.7m	$14.2m	$21.7m	$70.0m

3. Identified need

As described in Section 2, we have committed to, and are well on the path towards, the implementation of a fully capable ADMS. The foundations of the ADMS have been established through Phases 1 and 2 and Phase 3 is currently being delivered. The benefits of the investment so far will only be realised with the continuation of the program to achieve full implementation of the planned functionality.

In 2020 we submitted a business case for the implementation of an ADMS as part of our 2021-26 regulatory submission. The project was accepted by the AER and funding was provided in the Final Determination. The main business need in 2020 was that the network management system at the time was obsolete and the vendor was transitioning to provide only limited support which carried unacceptable risk. AusNet also recognised that a more advanced system was required to manage changes to the electricity network caused by the transition to a low carbon future.

Section 2.3 described the progress of the project and the elements that have been implemented. However, the scope of the first two Phases has been to identify the preferred ADMS system, design the system architecture and implement the foundational elements that will enable transition to the new ADMS.

Phase 3 has started to deploy new functionalities that are required to support AusNet's future readiness, however, the majority of the required functionality is not yet deployed and is required to both ensure the network can be safely, prudently, and efficiently managed in the future and to realise the benefits from Phases 1 and 2.

Each of the planned functionalities have been designed to directly address or support issues and capability gaps that have been identified on our network through long term planning processes related to the energy transition, customer feedback, actual performance during major events and independent Victorian government reviews.

The key drivers are summarised in the following sections.

3.1. Limitations and emerging issues

The emerging limitations and issues identified in the previous Future Distribution Network Management business case are still relevant and becoming increasingly urgent to address. These include:

- Increasing penetration of renewables on a grid that was originally designed and built for large scale one-way power flows has created challenges for AusNet in keeping energy supply and demand in balance and ensure frequency and voltage levels remain within tight technical limits.

- Increased frequency of extreme weather events, reduced base load generation, rapid technological change, evolving market players, and changing customer/regulator expectations are driving increased complexity on our network.

- The lack of integration between our ADMS and SCADA systems is becoming a more challenging issue as the complexity of the network increases, which over time decreases the responsiveness of our control room and can lead to more Human Error Incidents (HEIs).

- Greater workload and therefore stress on our controllers may hinder employee performance and retention, and therefore put the continuity of our capabilities and effective operation of the network at risk.

- The need to improve management of outages as identified from recent external and internal reviews including the Victorian Government's Network Resilience Review[3], the Victorian Government's Network Outage Report[4] and our internal Post Incident Report following the February 2024 storms that was conducted by Nous. The outcomes of these reviews are explained in the section below.

As these issues become more prevalent, they have potential to cause significant knock-on effects on efficiency and decision-making throughout the business. Without continuing the implementation of the ADMS, AusNet will not have the required capabilities to manage its network dynamically and effectively to respond to the issues noted above.

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[3] Electricity Distribution Network Resilience Review, Final Recommendations Report, May 2022
[4] Network Outage Review, Independent review of Transmission and Distribution Businesses Operational Response, Final report, September 2024

3.2.   Findings from recent reviews

Operating our network is becoming increasingly complex, with recent major events experienced during the 2021-26 regulatory control period exposing deficiencies in our current network management system[5].

Findings from Victoria State Government's Network Resilience Review[6] and Network Outage Review[7] have also highlighted shortcomings in how we manage outages to ensure efficient restoration of electricity services. These reviews have shown that AusNet needs to do more to improve network management.

The **Network Outage Review** made 19 recommendations to improve network reliability and management of network outages. The recommendations are largely focused on changes to regulation, cooperation between government agencies and electricity businesses, and reporting.

The **Network Resilience Review** made 8 recommendations to improve network resilience and management of network outages. These recommendations are primarily focused on actions that should be undertaken by the electricity businesses and include improved use of geospatial data, improved collaboration with other emergency support agencies, improved communications with customers and sharing data with other agencies.

If recommendations from these two reports are accepted and enacted by the Victorian Government, the changes will require significantly more information processing and data management than is currently available from AusNet's existing systems

The **Post Incident Review by Nous** was focused on AusNet's response to the major event of storms that occurred during February 2024. The review identified several deficiencies that were materially impacted or caused by inadequate functionality of the network management system or the inability of the network management system to handle the significant increase in utilisation. Key findings that related directly to the network management system were:

- **Insufficient system capacity** – the current system did not have adequate capacity to meet the needs of the large-scale event. Due to design, configuration and testing limitations, the system slowed down under high demand and the Estimated Time to Assess (ETA) and Estimated Time to Restore (ETR) algorithm was underspecified and unable to automatically communicate priorities (during high volumes) to field crews.

- **Inadequate system functionality** – the current system did not have functionality and integration between critical systems that would enable and facilitate more timely and accurate data capture, planning and outage restoration. The data and information available to CEOT is limited and difficult to access and the technology systems used by field crews were inconsistent in capability and did not provide full visibility of each job.

- **Processes are limited by the system capability** – prioritisation, control and visibility of fieldwork were inconsistent during the event, which impacted the speed of assessment and restoration. An adequately scoped and supported ADMS would provide additional automation to help manage the increased field work and ensure consistent and dynamic prioritisation of outage restoration.

- **Information provided to field crews was not clear** – the primary service provider encountered issues with how nested incidents were communicated and displayed on their field devices. This included duplicates, updates not progressing and faults being displayed that had already been attended.

The overall outcome of the Nous review was to upgrade the capacity of technology systems to meet the demands of major unplanned outage events, and to implement new functionality to increase the visibility of restoration work. This is consistent with the business need to be able to provide the information required by the Victorian Government reviews.

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[5] Post Incident Review into AusNet's response to the February 2024 outage event, Nous, May 2024
[6] Electricity Distribution Network Resilience Review, Final Recommendations Report, May 2022
[7] Network Outage Review, Independent review of Transmission and Distribution Businesses Operational Response, Final report, September 2024

3.3. Customer expectations

We aim to deliver services to a level of quality that is expected by our customers. Recent major events have highlighted deficiencies in how we respond to and manage outages. This has resulted in poor customer outcomes and less than satisfactory customer experience. Findings from our customer satisfaction program show declining customer sentiment towards the level of service they received in relation to planned and unplanned outages and new connections.

Findings from our customer engagement have highlighted the need for AusNet to improve how we meet customer information needs. Customers have told us that our inability to provide accurate information quickly and regularly, particularly during an outage, has been a source of frustration, distress, and disempowerment. Customers expect us to maintain accurate and update to date information, to resolve system errors quickly, make accessing and sharing information easier, provide more information to support customer autonomy and decision-making, and to support vulnerable and culturally and linguistically diverse (CALD) customers.

Our systems currently do not adequately meet these needs. Lack of integration between systems can lead to data inaccuracies and increase the risk of potential errors. Existing systems also have limitations regarding compatibility to incorporate new functionality. Consequently, without continuing the implementation of the ADMS, AusNet would lack the necessary capabilities to meet our customers' expectations regarding the accuracy and timeliness of information, particularly during outages.

3.4. Resilience Strategy

In response to the reviews described above, and recognising the expectations of our customers, AusNet has developed a Resilience Strategy for detailing planned performance improvements. The strategy has been informed by our engagement with our Electricity Availability Panel and consumers more broadly, who have helped us to target our efforts to best meet the needs of our customers and communities.[8]

While this resilience strategy formalises our approach to improving resilience for the first time, it is important to acknowledge that this has been an area of increasing focus for AusNet, our customers, the Victorian Government and industry regulators. Our Resilience Strategy describes our vision and approach for ensuring that we factor resilience into our decision-making, so that we deliver optimal outcomes for our customers when disruptive events occur.

A core element of the Resilience Strategy is to develop digital solutions to replace or enhance existing practices and invest in systems and processes to avoid outages and reduce their duration. This includes systems that improve network visibility and control, avoid outages, and improve response to reduce their duration. The ADMS program is a key component of delivering this Strategy and is linked to the Field Enablement and Network Model Management programs to provide a material uplift in AusNet's outage prevention, management and response capabilities.

Through our EDPR 2027-31 customer engagement program with our Electricity Availability Panel, our customers have provided strong support for the Resilience Strategy, and their willingness to pay for the investments required to deliver improved outcomes. [8]

3.5. Key gaps in current capabilities

In response to Victorian State Government findings, the findings from our independent review and customer research, and our understanding of trends in network operational needs, we have identified the following key gaps with our existing systems capabilities and functions:

- Unable to manage increasing network complexity (two-way flows, DER, etc)

- Does not provide sufficient capacity (computing power) during major events

- Does not provide adequate functionality for communicating with field crews

- Does not provide adequate functionality for communicating with customers

- Does not provide an integrated solution across key systems

- Does not enable adequate reporting capability and is not configurable for new requirements

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[8] Refer AusNet Resilience Strategy

- Does not provide advanced automation capability to manage our controllers' workload and therefore stress and potential for human error.

- As an older platform, [CIC] will lose the necessary vendor support in 2025 which will result in increased risk to AusNet's network.

These limitations will result in deteriorating service level outcomes and customer experience as evidenced by the poor performance during the February 2024 major event. It is also creating business process inefficiencies, and a reduced ability to respond quickly to customer requests for information and events on our network. Further, our current systems no longer align with or support our vision of delivering digital capabilities that support network stability and growth, while driving efficiencies for our customers and business.[9]

Continuing to build on the foundation ADMS capabilities delivered through Phase 1 and 2 by implementing Phase 3 and 4 will provide AusNet with the necessary capability and system functionality to:

- enhance and improve our outage management and restoration capabilities

- enhance wide area restoration capability

- improve alarm management to provide better clarity of network status for controllers

- improve DER management and enable DER optimisation

- implement systems to enable mobile switching[10]

- enhance our existing HV network model and develop an LV network model[11]

- provide real-time analytics capabilities

- establish an enterprise operational dashboard

- better digitalisation and integration of field management capabilities

- enable AusNet to undertake dynamic load shedding.

These capabilities and enhanced system functionality will better position AusNet to effectively and efficiently operate a more complex and dynamically changing distribution network, better integrate and support the uptake of DER, meet customer information needs, and reduce restoration timeframes.

3.6.   Risk analysis

We assessed the key risks to our network using the Enterprise Risk Management Framework. Our risk assessment has considered the cumulative impact of gaps identified in section 3.5 above on our ability to provide reliable, resilient and safe electricity services to our customers.

Figure 5 shows our assessment of the network risk with the current systems and platforms in place. These risks are reassessed to determine the residual risk under each option. Risks of highest concern are rated red, whereas those of lowest concern are rated blue.

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[9] AusNet Technology Strategy and Investment Plan
[10] The expenditure associated with this item is addressed through the separate Field Enablement business case.
[11] The expenditure associated with this item is addressed through the separate Network Model Management business case.

Figure 5 – Risk assessment of current state

		Consequence						Legend
		1	2	3	4	5		A
Likelihood	Almost certain		R1.2					B
	Likely		R1.3		R1.1			C
	Possible							D
	Unlikely							E
	Rare							

	RISK	CONSEQUENCE	LIKELIHOOD	RISK RATING
R1.1	Sub-optimal performance of ADMS during major events leads to lack of real time visibility and decision making on network operations, impaired response, and resulting extended customer outages	Level 4: Major impact to customer service levels with regulatory implications, as experienced during February 2024 storms	Likely	**B**
R1.2	Customer impacts increase and service performance is degraded as network complexity increases and ADMS (and associated platforms) are unable to provide advanced management and control functionality required	Level 2: Customers experience constrained exports and extended outages in areas of particular network complexity	Almost certain	**C**
R1.3	Outage, configuration issue or defect in different ADMS platform modules impacts system performance, impairing real time control and resulting in extended customer outages	Level 2: Impact likely to be localised unless during major event (refer R1.1), and likely with current non-consolidated platform architecture	Likely	**C**

4.   Options assessed

This section provides an overview of options identified that feasibly enable AusNet to address the limitations with our existing systems identified in Section 3. In developing these options, we considered alternative approaches for addressing the issues and gaps identified. Each option considers a different approach to implementation that will achieve the outcomes required for the future sustainability of the network, using a different system architecture and potentially delivering different benefits.

The AER's guidance note "Non-network ICT capex assessment approach" of November 2019 notes that non-recurrent expenditure should have a positive net present value unless a compliance requirement, or unless strong customer support and willingness to pay is demonstrated. In all cases, it is expected that timing and scope options of the investments (to demonstrate prudency) and options for alternative implementation approaches, systems and service providers (to demonstrate efficiency) will be evaluated. Assessment is to be made of the discounted costs against the benefits of the programme.

As per the AER guidelines, we have examined three credible options for delivery of the ADMS proposal. We examined whether the requirements could be met prudently and efficiently through using discrete task specific software solutions to augment one or more existing systems, whether the existing systems could be leveraged and upgraded to fully address the identified needs, or if a new system/platform would be appropriate.

4.1.   Quantifying benefits

Each of the three options assessed meet the identified need. However, the degree to which the options meet the identified need and address identified capability gaps varies. Consequently, options have been assessed based on the extent to which they address identified capability gaps in addition to cost benefit analysis findings and risk assessment findings from applying AusNet's Enterprise Risk Management Framework. The options are assessed relative to each other and a base case assumption of no additional investment, with existing systems and capability gaps remaining.

The benefits to customers and AusNet of the proposed investments were calculated based on review of prior outage event performance, the systems and process for each of the key task types involved, and an estimation of potential improvements. Analysis of historical data related to outages and safety incidents has been undertaken to assess improvements in reliability and network safety. The economic value of the reduction in outages experienced by customers was calculated based on the average value of customer reliability (VCR) for the AusNet distribution network, and from workshops with operational teams to assess potential outage time reductions if new systems and/or functionalities are implemented.

These benefits have all been modelled in the economic assessment of identified options based on the consistent set of assumptions set out in Table 6 below.[12]

Table 5 Key assumptions

ASSUMPTION	VALUE	COMMENTS
WACC	5.45%	Based on EDPR WACC
Average hourly cost ($ per hour)	[CIC]	Improved productivity enabling reduction of [CIC] from the control room and [CIC] from the scheduling team. Average staff rate applied for calculating cost savings
Value of customer time ($ per hour)	[CIC]	Economic value of customer time based on Australian Bureau of Statistics data for average weekly wage for Victorians.
Customer value of outages	VCR	Faster response time by [CIC], reduced number of short outages

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[12] Refer AusNet EDPR 2027-31 Digital Program NPV Model

Safety incidence avoidance	[CIC]	Per incident
Reduced annual emergency opex	[CIC]	Reduction of historical average emergency opex costs (FY23 RIN)
Deferred augmentation		Time value of money saving based on 2 year deferral.
Direct opex and capex improvements	Defined per item	Each area of improvement was assessed through consultation with internal teams to identify potential improvement areas

Source: AusNet analysis

4.2. Options analysis

We identified three credible options that addressed the identified needs by improving our systems and/or functionality. Each option considered a different system architecture approach to address the identified need and achieve the same outcomes required for the future sustainability of the network.

The resulting system functionality is forecast to provide the same benefits, however the system architectures to achieve the functionality are different and have different costs and risks.

Table 6 below outlines the options considered by this business case

Table 6 - Options evaluated

OPTION	SUMMARY
Option 1: Maintain existing ADMS foundation, augment with task specific applications	Maintain the existing systems and any new functionality required will be addressed with new task specific packages that may be from different vendors.
Option 2: Fully leverage existing ADMS foundation with upgrades and augmentation	Maintain the existing systems and any new functionality required will be addressed through upgrading existing modules or adding new modules from the existing vendor and software environment.
Option 3: Implement a new ADMS platform that addresses all needs	Replace all relevant systems with a new single software platform that will provide all functionality.

4.2.1. Option 1: Maintain existing ADMS foundation and augment with task specific applications

This option proposes to maintain the existing core systems and complete the in-flight initiatives. Any new functionality required to address identified limitations will be implementing by a new software package or system that is designed specifically to undertake the intended tasks. This approach would only apply to new capabilities (e.g. storm readiness, advanced forecasting, AMI integration) and not extensions of existing capability that have already been implemented. Summarised in Table 7 below is a comparison of the relative benefits, disadvantages, cost, ease of implementation.
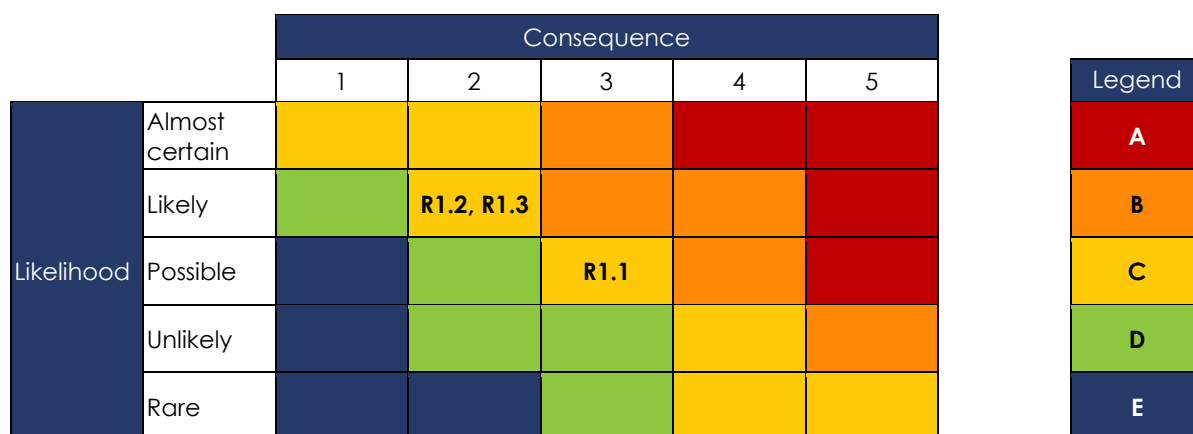
This option will address the capability gaps, but will result in higher risk to AusNet through a lesser degree of integration between systems (or higher cost to achieve integration) which will mean poorer network operations effectiveness and efficiency, and a lower level of vendor support resulting in higher risk to system performance if there are any configuration issues or defects.

Table 7 - Summary of Option 1's ability to meet identified capability gaps

Identified capability gap	Addressed?
Unable to manage increasing complexity (two way flows, DER)	Yes
Does not provide sufficient capacity (computing power) during major events	Yes
Does not provide adequate functionality for communicating with field crews	Yes
Does not provide adequate functionality for communicating with customers	Yes
Does not provide an integrated solution across key systems	**Partial**
Does not enable adequate reporting capability and is not configurable for new requirements	Yes
Does not provide advanced automation capability to manage our controllers workload and therefore stress and potential for human error.	Yes
Secure, long tern vendor support.	**Partial**

We assessed the key risks following implementation of Option 1 using the Enterprise Risk Management Framework as shown in Figure 5 below. This Option realises lower residual risk than current state, with the enhanced functionality able to reduce the extent and duration of customer impacts, resulting in lower consequences and likelihood. However, the analysis shows that there is a higher level of risk that will be accepted by AusNet if Option 1 is pursued, relative to Options 2 and 3.

Figure 6 – Option 1 risk assessment

		RISK	CONSEQUENCE	LIKELIHOOD	RISK RATING
R1.1		Sub-optimal performance of ADMS during major events leads to lack of real time visibility and decision making on network operations, impaired response, and resulting extended customer outages	Level 3: Improved functionality reduces extent and impact, but continue to see material impacts to customers	Possible	**C**
R1.2		Customer impacts increase and service performance is degraded as network complexity increases and ADMS (and associated platforms) are unable to provide advanced management and control functionality required	Level 2: Customers experience constrained exports and extended outages in areas of particular network complexity	Likely	**C**
R1.3		Outage, configuration issue or defect in different ADMS platform modules impacts system performance, impairing real time control and resulting in extended customer outages	Level 2: Impact likely to be localised unless during major event (refer R1.1), likely with a multi-vendor and complex integration platform suite	Likely	**C**

While this option may enable utilisation of more cost-effective task specific software packages, relative to the fully integrated ADMS in Options 2 and 3, the implementation requires more complex integration across multiple different vendors and platforms. Based on AusNet project experience, this is complex and incurs incremental cost as well as carrying material deliverability risk. Further, not progressing a fully integrated ADMS means that vendor support is more

challenging, with no single accountability and multiple support interfaces, which can particularly impact response during major events when systems are most heavily loaded. As a result, this option does not fully align with AusNet's Resilience Strategy and support the achievement of its customer commitments.

Our analysis of the option has found that while there are deliverability risks with implementing this solution architecture, it is technically feasible and can be implemented within the required timeframe. As showing in Table 9, the overall cost is estimated to be $67.3 million capex and $17.3 million opex, with the material opex driven by the inventory of new licence and support requirements for the new software packages. Our analysis has found that it has an NPV of -$15.2 million.[13]

Table 8 - Forecast expenditure for Option 1 ($'million, real FY24)

Cost item	FY27	FY28	FY29	FY30	FY31	Total
Capex	$15.75	$17.74	$15.00	$9.50	$9.35	**$67.34**
Opex	$1.36	$3.85	$3.90	$4.00	$4.14	**$17.25**
Total	**$17.11**	**$21.60**	**$18.90**	**$13.50**	**$13.49**	**$84.59**

The NPV for this option is lower than that of Option 2, and the overall risk profile is higher, hence this option is not recommended.

4.2.2. Option 2: Fully leverage ADMS foundation with upgrades and augmentation (recommended option)

This option proposes to continue to upgrade and augment the existing foundational ADMS products to deliver the functionality required to address the identified limitations, as originally set out in the ADMS roadmap and accepted by the AER at the 2021-26 determination. This approach will retain the current vendors and software environment and will proceed with the implementation of remaining updates detailed in Phase 3 and 4 of AusNet's ADMS roadmap.

This approach will fully address the identified capability gaps, using an integrated platform of [CIC] vendor modules and functionality.

Table 9 - Summary of Option 2's ability to meet identified capability gaps

Identified capability gap	Addressed?
Unable to manage increasing complexity (two-way flows, DER)	Yes
Does not provide sufficient capacity (computing power) during major events	Yes
Does not provide adequate functionality for communicating with field crews	Yes
Does not provide adequate functionality for communicating with customers	Yes
Does not provide an integrated solution across key systems	Yes
Does not enable adequate reporting capability and is not configurable for new requirements	Yes
Does not provide advanced automation capability to manage our controllers workload and therefore stress and potential for human error	Yes
Secure, long tern vendor support	Yes

Completing implementation of full ADMS functionality with a single vendor, as set out in the ADMS roadmap, minimises the risk of delivery and also reduces the cost and risk of integration of the systems and functionality. The deployment of the full ADMS as [CIC] also means that vendor support will be available for an extended period of time, enabling a long-term relationship and single support interface, which mitigates risks during outage or system issue events. This option will enable AusNet to fully address the identified need, aligns with AusNet's Resilience Strategy, and supports the achievement of its customer commitments.

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[13] Refer AusNet EDPR 2027-31 Digital Program NPV Model

We have assessed the key risks following implementation of Option 2 using the Enterprise Risk Management Framework. Our analysis shows that this option will materially reduce the risk to AusNet as shown in Figure 6 below. The integrated and advanced functionality of a single, readily supported, ADMS platform reduces the risk compared to Option 1.

Figure 7 – Option 2 risk assessment

RISK		CONSEQUENCE	LIKELIHOOD	RISK RATING
R2.1	Sub-optimal performance of ADMS during major events leads to lack of real time visibility and decision making on network operations, impaired response, and resulting extended customer outages	Level 3: Improved functionality and integrated ADMS platform reduces extent of customer impact and likelihood of occurrence	Unlikely	**D**
R2.2	Customer impacts increase and service performance is degraded as network complexity increases and ADMS (and associated platforms) are unable to provide advanced management and control functionality required	Level 2: Customers experience constrained exports and extended outages in areas of particular network complexity	Unlikely	**D**
R2.3	Outage, configuration issue or defect in different ADMS platform modules impacts system performance, impairing real time control and resulting in extended customer outages	Level 2: Impact likely to be localised unless during major event (refer R1.1), and lower likelihood from integrated platform	Unlikely	**D**

The overall cost of Option 2 is estimated to be $60.4 million capex and $15.9 million opex, as show in Table 11. This cost is lower than Option 1 due to limited integration costs with common platform modules being pre-integrated, and ongoing licence and support costs being lower as provided through a single vendor. Our analysis has found that this option has an NPV of $3.7 million.

Table 10 - Forecast expenditure for Option 2 ($'million, real FY24)

Cost item	FY27	FY28	FY29	FY30	FY31	Total
Capex	$14.25	$15.49	$14.50	$8.50	$7.65	**$60.39**
Opex	$1.06	$3.40	$3.80	$3.80	$3.80	**$15.86**
Total	**$15.3**	**$18.9**	**$18.3**	**$12.3**	**$11.4**	**$76.25**

The NPV of this option is the highest of the options assessed and it has the lowest risk profile. This option is also consistent with the ADMS roadmap accepted by the AER at the 2021-26 determination, and is aligned with our Resilience Strategy and customer commitments. Hence Option 2 is recommended.

4.2.3. Option 3: Implement a new ADMS platform that addresses all needs

This option proposes to re-platform the ADMS and implement a new system, that delivers all target functionality in single new implementation. This would see AusNet revisit the market assessment, vendor selection and initial implementation already completed during the current regulatory period.

Our experience has found that replacing entire systems requires significant time, is highest cost and has a high risk of exceeding the forecast expenditure budget. Further, our detailed market analysis at the initiation of this ADMS project demonstrated that the selected products, [CIC   ] and the related [CIC   ] product suite, are the best solution available with respect to required functionality, deliverability, risk mitigation and cost. [CIC   ].

Potential alternative ADMS platforms that could be implemented under this option are provided by [CIC   ]. While we have not undertaken a specific market analysis or open tender, we remain current with the industry and developments in different products in many ways including through vendors and discussions with peers at other DNSPs. We have not found any evidence that would suggest our assessment of [CIC   ] as the best solution for AusNet has changed since the initiation of this project.

For assessing this option it is assumed that the alternative would come from one of these vendors. Consistent with Option 2, all would provide the required functionality and address the identified capability gaps. Similarly, all would reduce residual risk to the levels detailed in Option 2, with residual risk consistent with that detailed in Figure 6. However, given the scale of implementation, and recognising that AusNet's current ADMS implementation has been underway for 4 years already, fully implementing new platform is assessed as having a high risk of deliverability within the required timeframe.

Based on our analysis at the start of the ADMS program in 2020, we estimate that implementation of one of these alternative vendor platforms would cost $109.4 million capex and $19.1 million opex, as shown in Table 11. This option has an NPV of -$53.6 million.

Table 11 - Forecast expenditure for Option 3 ($'million, real FY24)

Cost item	FY27	FY28	FY29	FY30	FY31	Total
Capex	$34.25	$31.49	$16.50	$14.50	$12.65	**$109.39**
Opex	$1.86	$4.75	$4.80	$3.80	$3.94	**$19.15**
Total	**$36.11**	**$36.25**	**$21.30**	**$18.30**	**$16.59**	**$128.54**

We consider changing vendors at this point time in the project is not a prudent or efficient option given the significant sunk costs and time incurred in migrating to the [CIC] ADMS platform and deploying the foundation ADMS capability. As a result, this option is not recommended.

5. Preferred option

Our analysis has found that Option 2 provides the highest, and only positive, NPV and will result in reduced cost to our customers while meeting customer expectations.

Additionally, Option 2 is the only option that enables AusNet to fully address the gaps in our network operations capabilities, with low deliverability risk, to achieve our customer commitments of improving resilience and customer service outcomes. Option 2 sees AusNet complete the implementation of our ADMS roadmap, as accepted by the AER at the 2021-26 determination.

Therefore, Option 2 is preferred as summarised in Table 12.

Table 12 - Options analysis summary

Criteria	Option 1	Option 2	Option 3
NPV ($'000, real FY24)	-$15,220	$3,687	-$53,580
Capex ($'000, real FY24)	$67,344	$60,394	$109,394
Opex ($'000, real FY24)	$17,247	$15,857	$19,147
Technically feasible	✓	✓	✓
Addresses identified need	✗ (Partial)	✓	✓
Meets customer expectations	✗ (Partial)	✓	✓
Deliverable within timeframe	✓	✓	✗
Delivery risk	Moderate	Low	High
Preferred option	✗	✓	✗

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