AMS 01-08 Asset Management Plan 2020-21 to 2024-25

2023-27 Transmission Revenue Reset

PUBLIC

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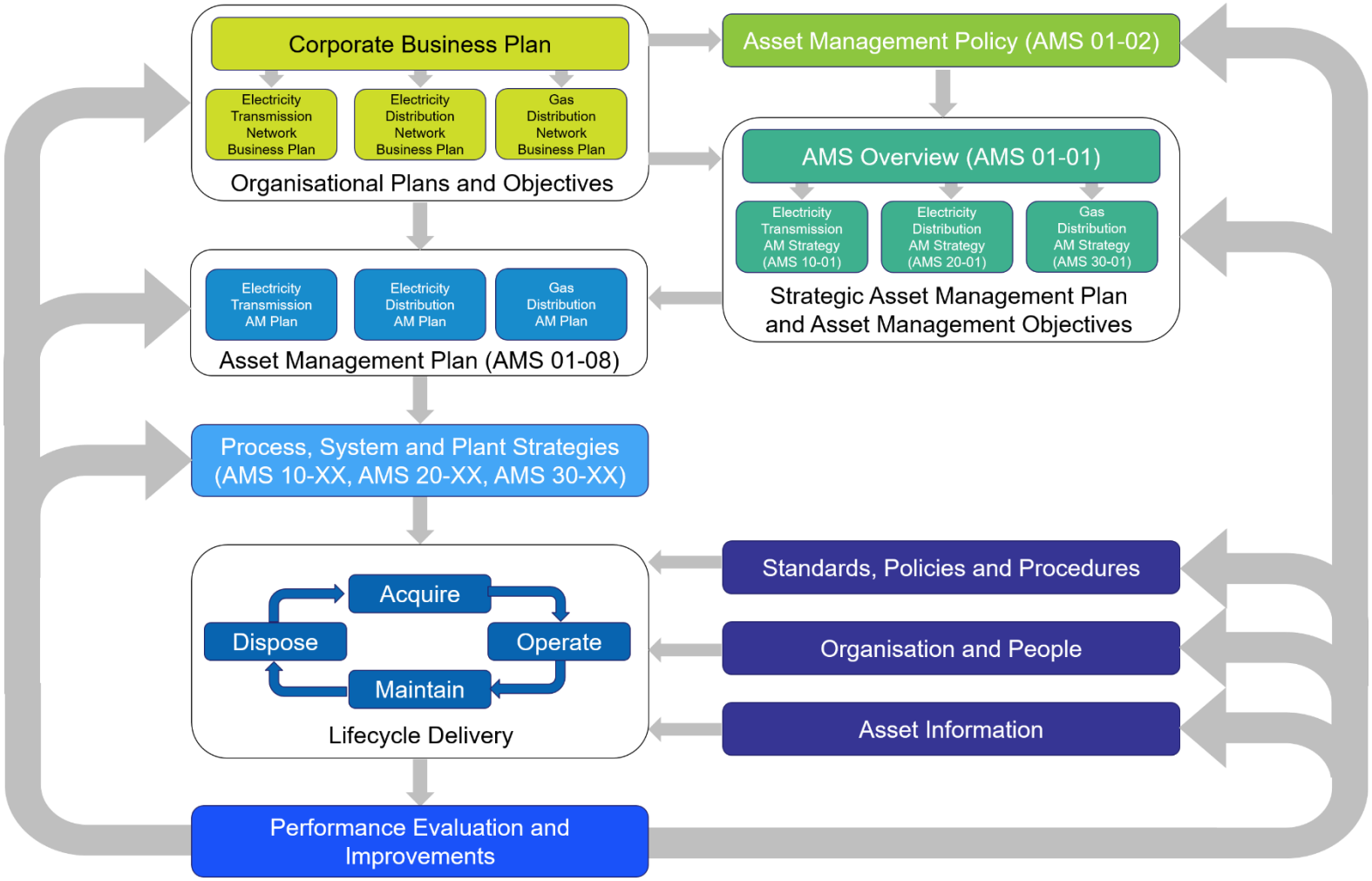
- **The AMP was originally developed in early 2020 but was not implemented due to the onset of COVID-19. This version of the plan has been revised to consider the impact of COVID-19, notably the deferral of some expenditure**

Asset Management System



The documents shown in this diagram are available on ECM and SharePoint

Key Factors - Internal

Benchmarking

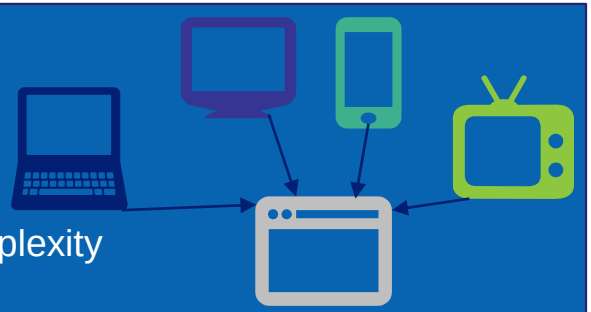
- Distribution network productivity and cost performance remain challenged
- Transmission and gas networks have good productivity performance
- Gas network totex is one of the lowest in Australia

Network Age & Condition

- Condition 5 asset replacements
- New inspection techniques and staking for distribution poles
- Gas LP mains replacement
- Major EHV asset replacements on 10-year horizon

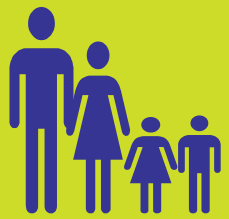
Data & Information

- IM Platform creates opportunity to use data analytics to make better AM decisions
- Automation of operational processes during outage events
- Increasing demand on communications network with increasing complexity and interaction with protection
- Individual data analytics use cases are being progressed incrementally



Key Factors - External

Customers



- Cost sensitive
- Facilitate their energy choices
- Support safety programs
- Pro-active customer engagement

New technologies

- Batteries and Solar PV becoming cheaper and more accessible
- More efficient appliances leads to lower energy consumption
- Electric Vehicle take up forecasted to increase

Changing use of networks

- Decreasing gas & electricity consumption per customer but increasing peak demand
- Increasing minimum demand
- New customer connection volumes remain solid
- Some new households choosing to opt for all electricity
- Large scale battery storage gaining attention
- Gas 2050 – Hydrogen future
- Solar & wind generation is changing risk profile of network
- Growth in DER leading to minimum demand during daytime and increased reverse power flows
- Increased energy demands during daylight due to changed working habits due to COVID-19
- Victorian grid strength and constraint in NW

Economic Regulations

- New CAPEX Incentive Scheme from 2018 for Gas
- Longer periods required for forward planning
- Longer consultation periods for price reviews
- Increased attention to non-network solutions; uncertain ownership
- RIT for REPEX T and D
- Financial incentives encouraging DER take up
- Changes to economic recession

Safety regulations

- Regulatory & technical hurdles to be overcome to meet REFCL obligations including ZSS rebuilds
- ESV increasing monitoring and auditing activities
- Business risk due to cost recovery processes

Changing energy environment

- Power station closures forecasted
- Transition to renewables / “low emissions” to meet government commitments
- Depletion of gas reserves in the wholesale network requires investment in alternative fuels
- Increasing number of small-scale generators distributed throughout the network
- Adjusting to COVID-19 impacts

Status of Key Risks

Safety

- **REFCL's continue to be installed and will reduce bushfire risk**
- **R&D programs targeting safety improvements**
- **Equipment replacements based on condition and criticality**
- **Explosive failures included in the critical risk program**
- **Gas safety risks stable; controlled through delivery of mains replacement programs**

Failure to supply

- **Major risks mitigated by spares & contingency plans for key assets**
- **Network Resilience program working with AEMO**
- **Security of Transmission under threat from power station closure and renewables**
- **Value of unserved energy incorporated into Risk Based Asset Management decisions**

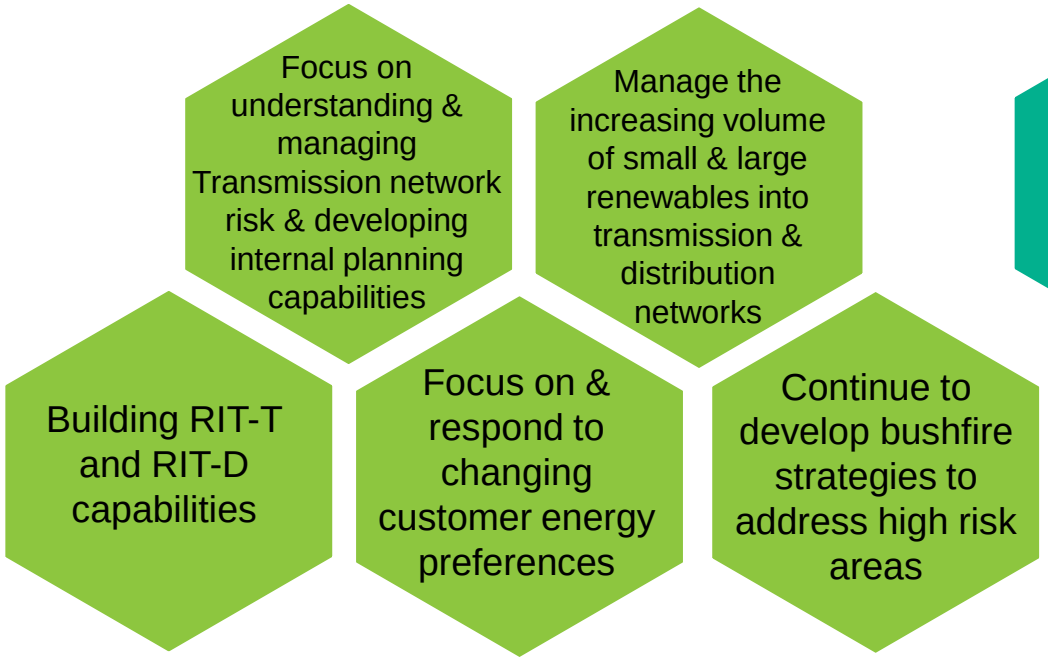
Network capacity

- **Small gas network augmentation program will meet ongoing growth in gas demand**
- **Low growth in electricity demand provides adequate time to add distribution network capacity or engage demand side response**
- **Transmission capacity tied to generation locations; enhancing internal Transmission planning capabilities to reduce reliance on, and actively influence AEMO.**

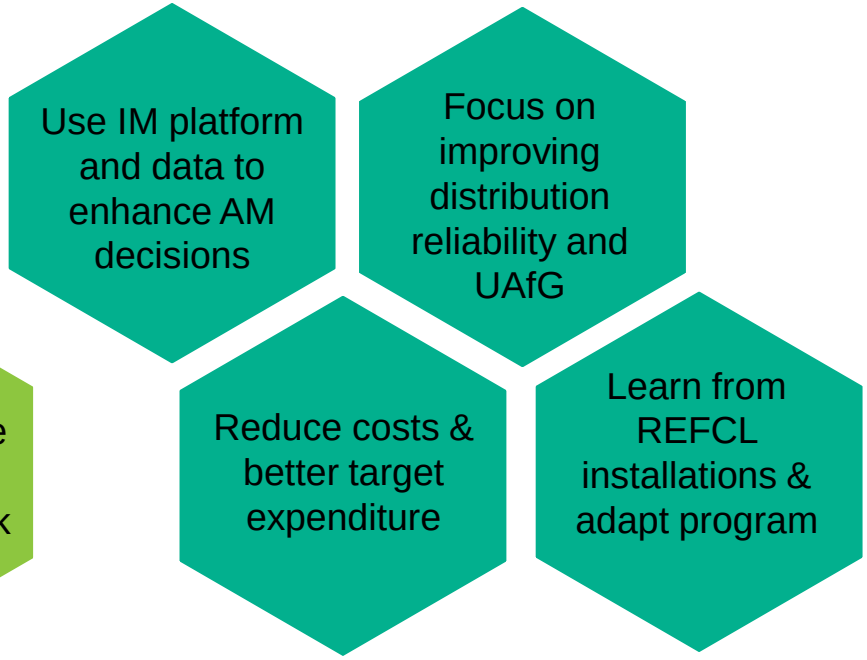
This Plan aims to maintain risk in line with AusNet Services' Risk Appetite Statement

Key AM Focus Areas (1 of 2)

Strategic focus areas

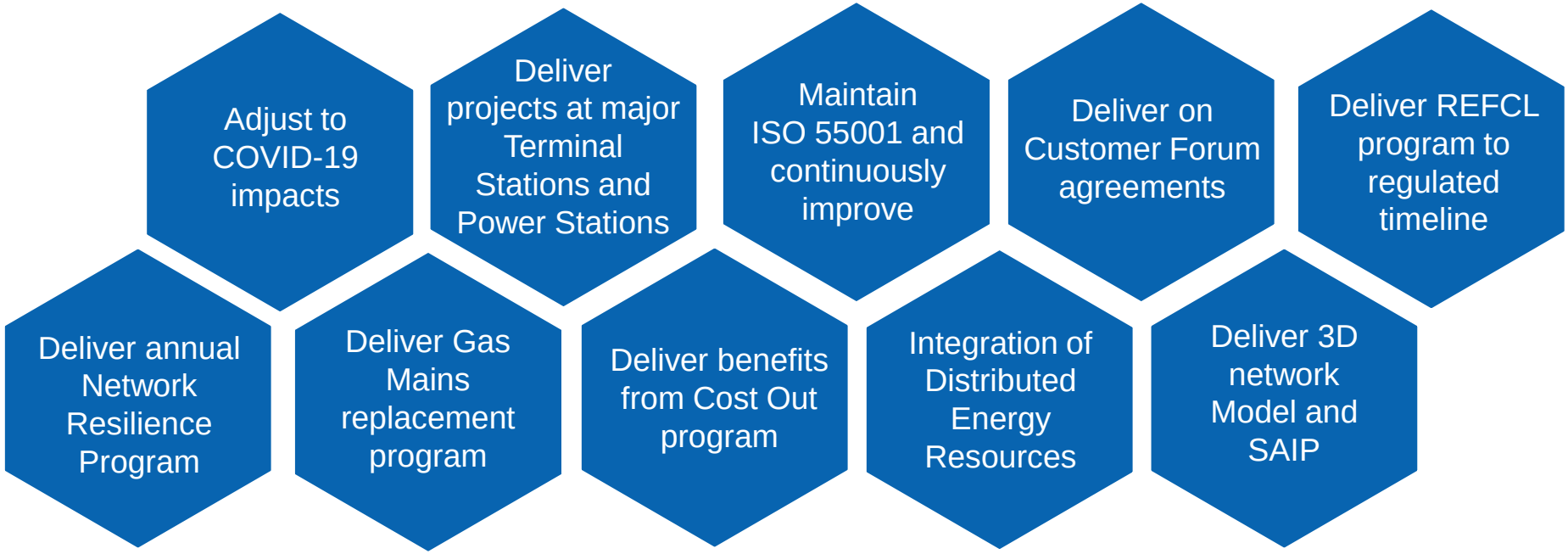


Improvement focus areas



Key AM Focus Areas (2 of 2)

Tactical focus areas



Network Status Summary

	Electricity Distribution		Electricity Transmission		Gas Distribution	
Safety		REFCL's and Smart Meter data used to improve safety		10-year project forecast proposed to managed C5 assets		Maintaining performance due to low pressure mains replacement
Reliability		Below target recent performance Uncertain effects of REFCL operation on reliability		Major replacement projects target C5 assets		Improving performance due to low pressure mains replacement
Security		Demand growth and augmentation requirements being monitored		New generation introduces uncertainty in North-West loop		Secure by design
Major CAPEX		REFCL projects, Pole, Crossarm and Conductor Replacement		SVTS and WMTS redevelopments continuing		Customer connections, Mains replacement
OPEX Trend		Change in delivery should lead to lower costs		EDDAM program will lead to reductions in inspections costs		EDDAM program extended to Gas assets, underspent in all key categories
Age & Condition		Assets aging but condition stable, stations maintained		Station assets subject to renewal, aging towers and lines exhibiting gradual deterioration		Mains and city gates maintained, Transmission pipelines aging but condition stable

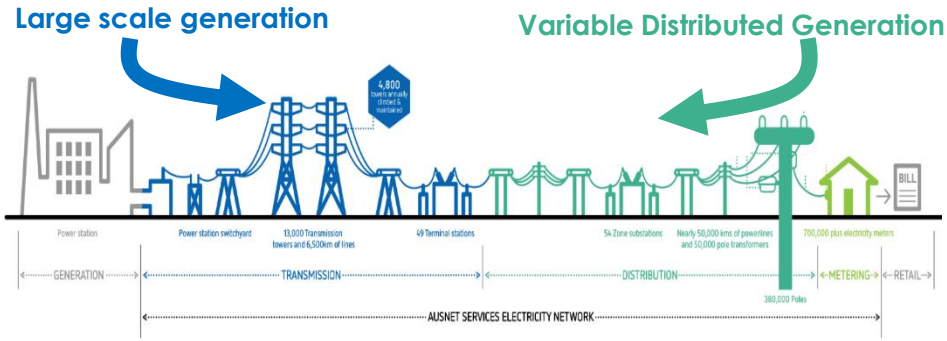
KEY				
	Current status	Exceeding target	Meeting target	Not meeting target
	Aim of strategies	Improve	Maintain	Decline

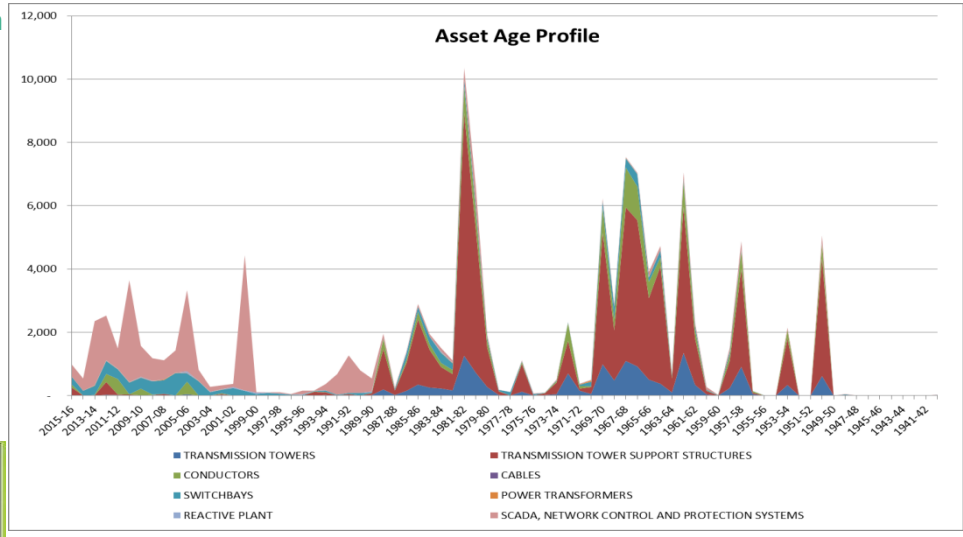
Asset Management Objectives

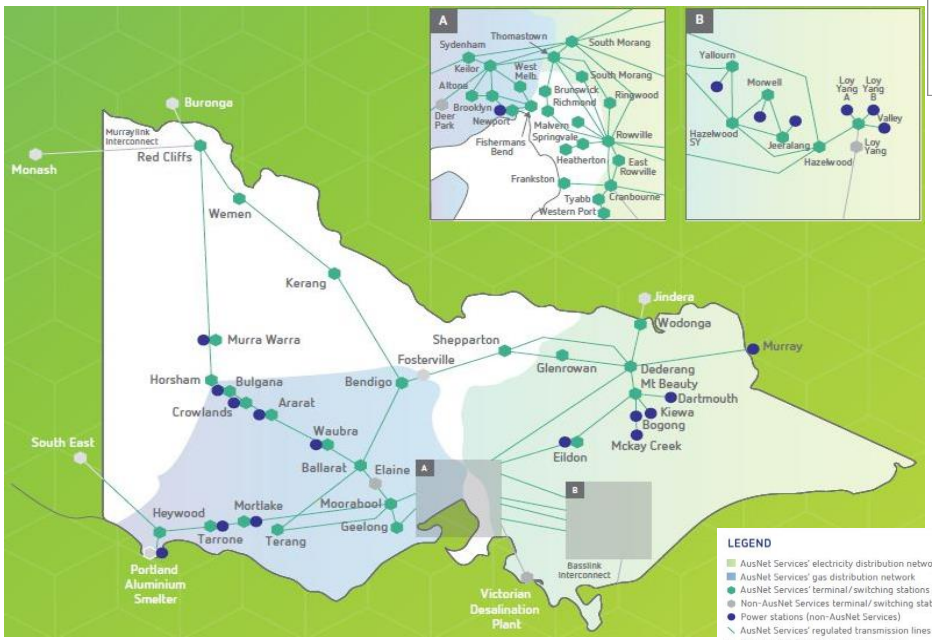
ELECTRICITY TRANSMISSION NETWORK

Asset Management Plan 2020/21 to 2024/25

Network Overview







Asset	Number/length
Towers	13,212
Conductors	12,124 km
Switchbays	9,011
Power Transformers	165
Reactive plant	468

Stakeholder Expectations - Transmission

	Safe Network	Responsive service	Access to network	Efficient service costs	Environmental performance	Regulatory Compliance	Reward, recognition & development	ROI & growth	Reliable information	Support economic development	Work coordination & reinstatement	Reliable network
Connected parties		X	X	X								
Community	X				X							X
Employees & contractors	X						X					
Shareholders	X							X				
Energy Retailers				X					X			
Safety Regulator	X					X			X			
Economic Regulator				X		X			X			
State & Federal Government	X			X		X				X		
Local Government & VicRoads	X										X	
AEMO	X											X

Stakeholder relationships are complex and diverse

Issues & risks - Transmission

Planning and Operational Challenges

- Voltage management:
  - Outages
  - Minimum demand is reducing (worsened by COVID-19) – reactive support required
- Restrictions on planned maintenance, potential backlog through deferral of work during COVID-19
- Planning of transmission network
- SAIP creating a baseline for conductor replacement
- Weak network – generation connection

Condition Assessment

- Transition from desktop assessment to evidence-based assessment
- Trial visual inspection with drones on transmission towers
- Sulphur in transformer oil
- Towers in corrosive areas require treatment
- Ongoing need to refine inspection frequency e.g. stations

Major Projects

- Redevelopment projects at WMTS, SVTS, FBTS, HWTS and HYTS
- Deferral of WMTS (11kV) leads to additional asset risk which must be managed during rebuild
- RITs underway for ERTS and TSTS
- Western VIC renewable integration

Changing Regulations

- Implementation of Regulatory Investment Test (RIT) for asset replacement may extend project timeframes.
- RIT to include impact of high consequence events in cost-benefit analysis
- NEM design being questioned due to SA blackout
- Multiple RITs for augmentation and replacement
- Actionable ISP regulations & 2020 ISP underway

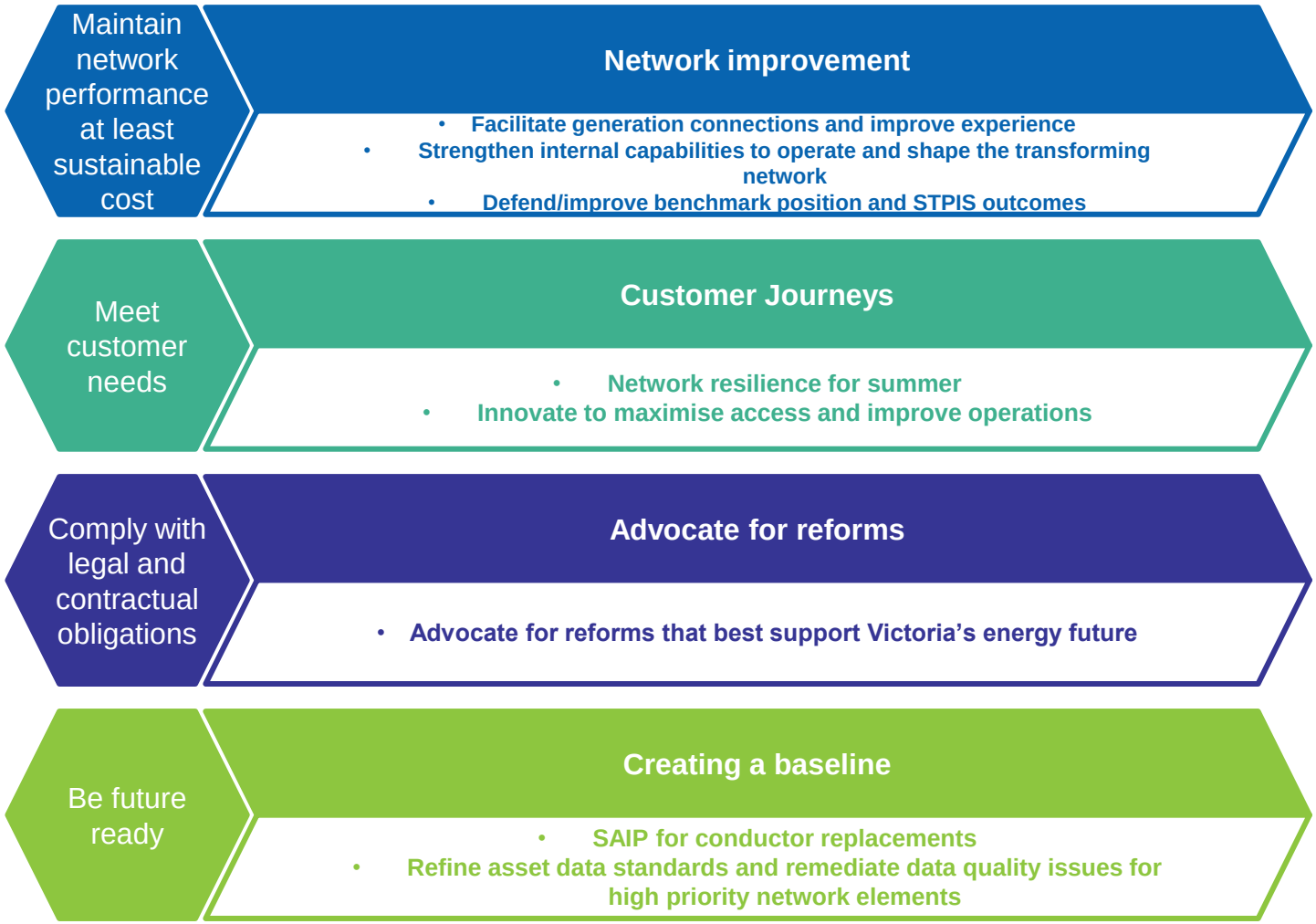
Generators & Load Closures

- Renewable generators (NW of state) and new / expanded interconnectors (new SA connection and Heywood & Basslink upgrades) would change power flows affecting lines, transformers, stability & security
- Increasing volume of enquiries and applications for new connections.
- Communications, complexity of protection and control
- Alcoa Portland smelter to continue operating until at least 2021.
- Uncertain timing of future generator closures would result in major change to network services and power flows

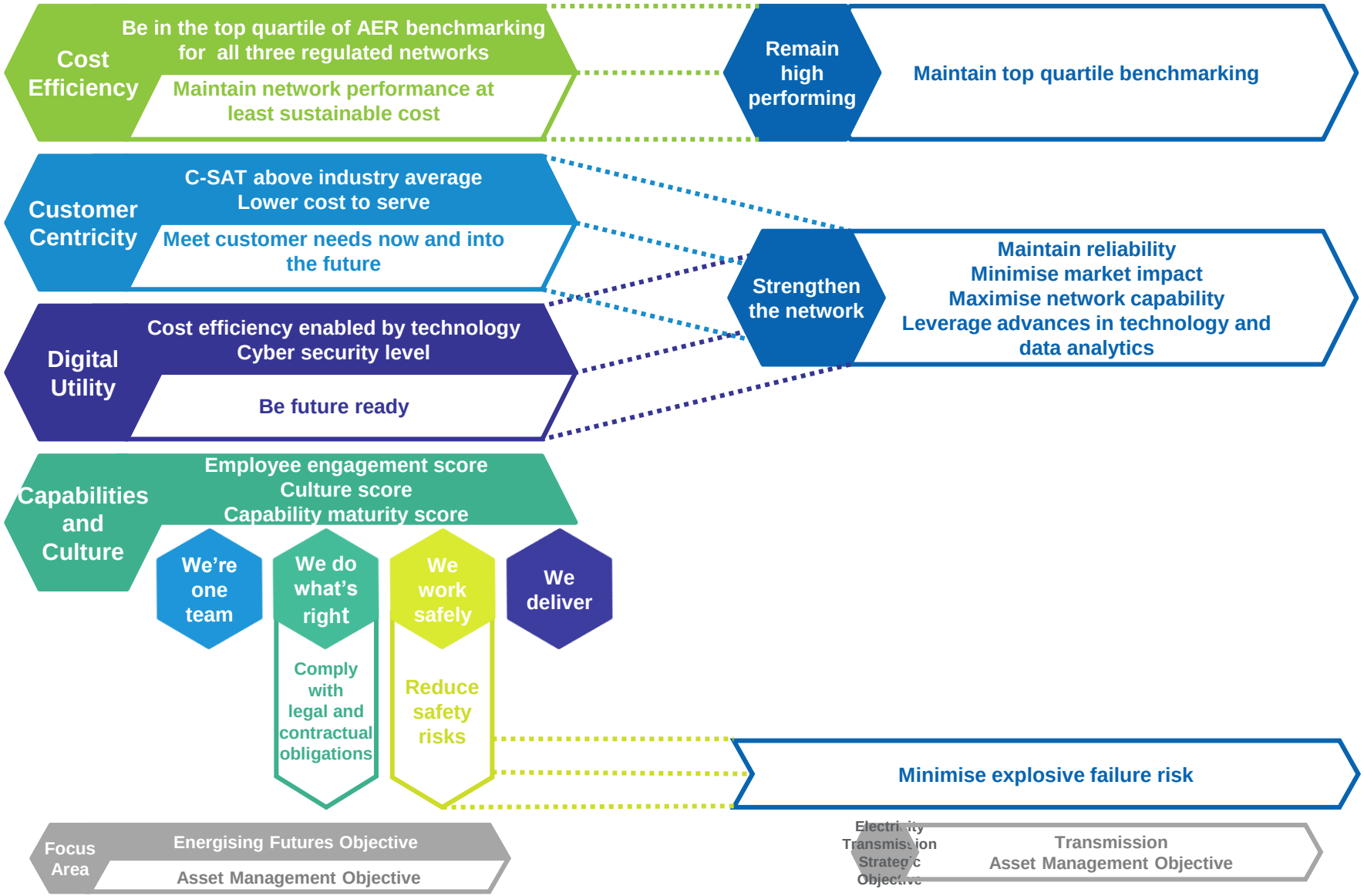
Critical Asset Failure

- Risk of explosive failure incorporated into criticality and risk assessment of assets
- Risk must be managed during replacement projects when many workers are present
- Some switchgear de-energised to reduce risk
- tower collapse
- Telecommunication outages
- Transformer outages

Electricity Transmission Focus Areas



Electricity Transmission Network Strategic Objectives



Performance targets 2020

Electricity Transmission Network Objectives	Measure	Target
Maintain a reliable and secure network	STPIS – Service Component (unplanned)	≥ -$1M (FY2018 to FY2022)
	STPIS – Market Impact Parameter Component (planned & unplanned)	≤ 1,245 Dispatch intervals (excl. customer-initiated outages)
	STPIS – Network Capability Component	Increase 15 min short term rating of BETS-KGTS-WETS-RCTS 220kV transmission line. Increase 15 min short term rating of BATS-TGTS-MLTS 220kV transmission line.
		SmartWires Research Project – Install 30 SmartValve devices at WOTS on the Jin-WOTS 330kV transmission line to deliver approximately 7Ω of controllable series reactance to increase the interstate power transfer capability.

Major Programs FY21 – Transmission

Maintain network performance at least sustainable cost

Major Station Rebuilds
Major station rebuilds to continue at FBTS, ERTS, SVTS, RTS

CB Replacements
Major CB replacement projects at LYPS & HWTS budgeted $5.7m, FBTS budgeted $5.0m

Meet customer needs

Network Resilience Program

Focus on priority preventative and correct maintenance on the critical transmission network elements

Be future ready

SAIP
Safe, low cost way of inspecting 6,500km of HV powerlines. Expected to create a new baseline for conductor replacements

North West Comms Loop
Complete North West Comms Loop replacement project

Comply with legal and contractual obligations

Tower Replacement

Replacement of six to eight towers that have been damaged due to weather

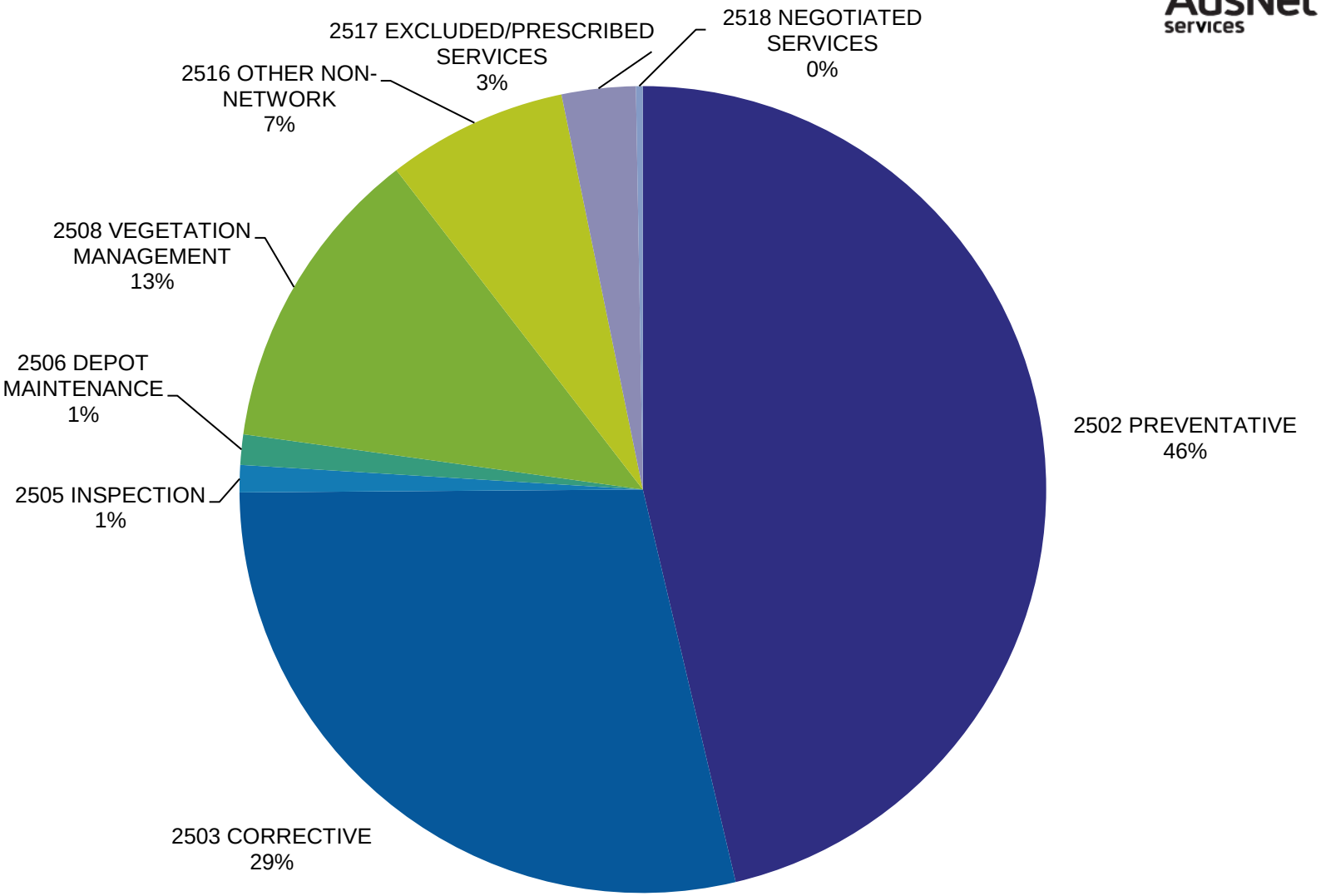
Reduce safety risks

Explosive Asset Failure
Explosive failure CB's replacement

Tower Climbing
Risk based asset management initiative, tower climb frequencies to reduce.

Asset Management Objective
Major Program/Project
Major Program/Project

Transmission Network
Opex programs 2020/21



$26M

Appendices

1. **Asset Management Policy**
2. **IT Plan**
3. **AMP Continuous Improvement Plan**

Appendix 1
Asset Management Policy

Empower communities and their energy future

This policy directs the content and implementation of asset management strategies, objectives and plans for AusNet Services' energy delivery networks. It provides employees, contractors, suppliers and delegates with guiding principles to underpin asset management decisions.

Our approach to Asset Management is centred around our objective to create a leading, modern energy company that will operate its networks in the top quartile of efficiency benchmarks with the aim to care for customers, enable their choices and strive to make their energy more affordable.

To achieve this we will:

- Minimise risks to the safety of any person and their property "as far as practicable".
- Place customers at the centre of our decisions to support their evolving needs and the changing energy landscape.
- Engage with our customers and stakeholders to understand and integrate their requirements in asset management decisions.
- Comply with legislation, regulation, relevant Standards and industry codes and actively contribute to the development of amendments that will benefit our customers and stakeholders.
- Use a risk-based approach to manage the energy networks and balance the environmental, economic, and social needs of today without sacrificing the interests of future generations.
- Use innovation, information and technology to facilitate a whole of life cycle approach to asset management to deliver value to our customers, communities and partners.
- Continually develop the skills of our people to ensure asset management activities are performed efficiently and effectively.
- Align and continuously improve our asset management processes and capabilities in accordance with certification to ISO 55001 Asset Management.

Appendix 2
IT Plan

Asset Management

Programs

Works & Asset Management

*Effectively managing our Work and Assets. Balance our internal **Strategic Objectives** of Network Safety & Operational Efficiency with **External Pressures** to reduce network prices whilst maintaining reliable energy services.*

Energy Network Management

AusNet Services Energy Networks will leverage existing infrastructure and emerging technologies to unlock grid flexibility (e.g. multi-directional power flow) and new value streams for our customers.

Information Management

Improving Automation, Network Modelling, Predictive Fault Finding, Condition Assessment, and Network Optimization.

Supporting Projects & Initiatives *

- Drawing Management: CAD & Drawing Management Upgrade
- Mobility: Mobility Enablement & Improvements
- Enterprise Asset Management: SAP Continuous Improvement program
- LV Network Analytics & Integration of Renewals
- Reporting
- Lifecycle Updates & Minor Enhancements
- Program WorkOut

- Outage Management & Planning: DOMS Upgrade, PowerOn Fusion, SNET, OSIPI, Fusion Technical Upgrade, Connection Point Management, GAS OMS Replacement, Fusion Major Upgrade, Refinement and Grouping of Operational Alarms, Consolidate Ratings and Limits, Enhance Distribution Feeder Automation, LV Network Management in DMS, Sync Cause Codes SAP and Fusion, Transmission Switching Instruction Management.
- SCADA: Alstom & OSI Pi Upgrades, Spatial and Asset Data Synchronisation & Quality Improvement, SDMe Inclusion of Zone Sub-Stations and Terminal-Stations, Spatial Data Viewer Consolidation
- Power Quality Management: ION Upgrade
- Protection & Configuration Management: TRESIS/RESIS Migration
- Reporting: RADAR RDB Reporting for AEMO

- Information Management Platform
- Next Generation Business Focused Analytics
- Analytics: Self Service Analytics & Exploratory and Predictive Analytics
- Geospatial Visualisation
- Dashboarding
- Benchmarking
- Reporting:
- AMI Data Warehousing
- SAP Business Warehouse
- Data lake
- Advanced Analytics Platform

* Subject to Prioritisation, Planning, & Approval

Appendix 3
AMP Continuous Improvement Plan

Item	Description	Status
Mondo AMP	Include Mondo assets into the AusNet AMP	Consider in later versions of plan

Version Control & Approvals

Version	Status	Description	Author(s)	Approval	Date
0_1	Draft	Priorities and objectives updated	A Payne-Billard	Unapproved	15/11/19
0_2	Draft	Added Focus areas and Major Programs	A Payne-Billard	Unapproved	11/12/19
0_3	Draft	Amendments after comments from business areas	A Payne-Billard	Unapproved	7/01/20
0_4	Draft	Addition of November CAPEX data	A Payne-Billard	Unapproved	02/02/20
0_5	Draft	Addition of work volume data	A Payne-Billard	Unapproved	06/02/20
0_6	Draft	Updated with February CAPEX data	A Payne-Billard	Unapproved	07/02/20
0_7	Draft	Updated with feedback from AMC	A Payne-Billard	Unapproved	17/02/20
0_8	Draft	Updated with OPEX data	A Payne-Billard	Unapproved	19/03/20
0_9	Draft	Updated with FINAL CAPEX data	A Payne-Billard	Unapproved	27/03/20
0_10	Draft	Updated with COVID impacts. Presented to AMC.	A Payne-Billard	Unapproved	16/06/20
1_0	Final	Approved by AMC	A Payne-Billard	Approved	18/06/20