

Operations Technology Program

Operations Planning Working Group
15th March 2023

Our Priorities



PRIORITY 1

Operating today's systems and markets



PRIORITY 2

Navigating the energy future



PRIORITY 3

Engaging our stakeholders



PRIORITY 4

Evolve the way we work

Strategic Objectives

Priority 1 – Operating today's systems and markets

Deliver our core responsibilities in accordance with electricity, gas and other laws and regulations.

Our primary role is to ensure that Australia's energy systems and markets are operated reliably and securely every day.

In an environment where day-to-day operation of the nation's energy systems and markets has never been more challenging, AEMO will maintain our focus on constantly adapting our operations through FY2022 and meeting this ongoing commitment to Australian consumers.

We will maintain and enhance our focus on effective real-time system and market operations, power system resilience, cyber security and robust market and system intelligence.



How we will achieve this priority:

1. System and market operations

We ensure Australia's energy systems and markets can be securely and reliably operated under all foreseeable conditions.

In addition to delivering effective day-to-day real-time system and market operations, AEMO will:

- **Engage on, and manage emerging power system resilience issues** through cost-effective measures that improve the ability of the power system to ride through extreme events.
- **Ensure operational plans are in place** to manage increasingly common challenges that stem from a changing energy mix, including minimum electricity demand, lower levels of synchronous generation, and new ways to optimise ancillary services to maintain system strength and security.

2. Energy system and market insights

We publish statutory publications, reports and energy and market intelligence to the satisfaction of our stakeholders.

- **Deliver quality, timely reports and publications** that are valuable to AEMO stakeholders.

3. System and market technologies

We leverage technological innovations, uplift systems and invest in advanced analytics and forecasting capabilities to improve the efficient and secure operation of energy systems and markets. Significant investment is being made to better deliver system performance at a reduced cost.

- **Upgrade and/or replace legacy grid and market IT systems** with more intelligent and scalable technology that meets the evolving demands of the industry.
- **Enhance our forecasting and real-time operations capabilities** to streamline control room decision-making processes. New technologies will provide access to timely and accurate data, advanced analytics and workflow-driven visualisations and forecast through a common platform.
- **Ensure enhancements to IT systems and procedures can manage the energy system** at lower levels of demand, synchronous generation dispatch and increasing levels of variability (including improved forecasting).

4. Cyber security

We work with government and industry to safeguard AEMO's and Australia's energy systems and data from malicious intent and intrusion.

- **Mature our cyber security capability** by enhancing our monitoring and detection of malicious activities through automated tools and Security Operations centre and enhancing our threat response by upgrading system recovery and back up options.
- **Actively engage with governments and industry to strengthen cyber security** by supporting industry insights and readiness assessments regarding cyber threats and activities, providing input into Commonwealth Critical Infrastructure Systems of National Significance Legislation, and sharing cyber information with members.

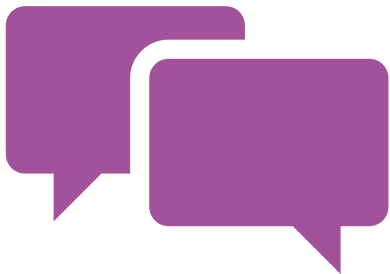
A Critical Decade of Change

Australia is experiencing the world's fastest and most profound power system transformation.

The '4 x Ds' of **decarbonisation**, **digitisation**, **democratisation** and **decentralisation** are directly impacting the system, accelerated by a complex range of societal, technological, economic and commercial shifts.

In recognition of the sheer pace and scale of change now confronting Australia's power systems, EF notes:

“Traditional, legacy approaches will need to be maintained in the near term, but inherent structural limitations will eventually constrain the pace of transition. Parallel to this, it is critical that designing a step change in power system capability starts today”



Daniel Westerman,
AEMO's CEO

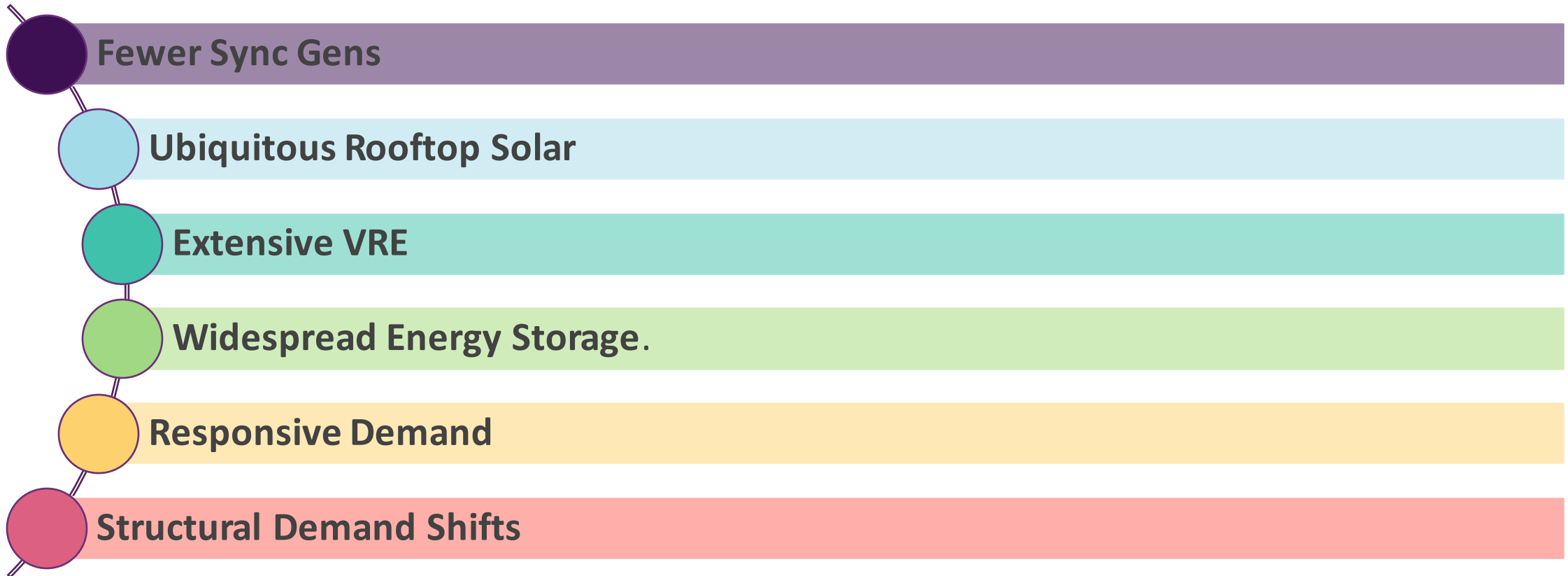
“It is a stunning democratisation of power.”

“It's a transformation: turning historically passive electricity consumers into active generators.”

“And a capital transfer, too. Power infrastructure investment decisions that were once the preserve of our nation's boardrooms are now being made around the kitchen tables in our towns and suburbs.”

How the Operational Need is Changing

Engineering Framework Operational Conditions



The six identified future operational conditions from AEMO Engineering Framework, <https://aemo.com.au/-/media/files/initiatives/engineering-framework/2021/nem-engineering-framework-initial-roadmap.pdf?la=en&hash=258E0F1A2E8E6EE6C00437E75BB170FF>

Control Room of the Future (CROF)



Vision Statement

“A secure, flexible, adaptable, space where systems are integrated, interoperable and automated. All resources are maximised, and personnel are highly trained, in simulators to make data-driven decisions based on accurate forecasts.”

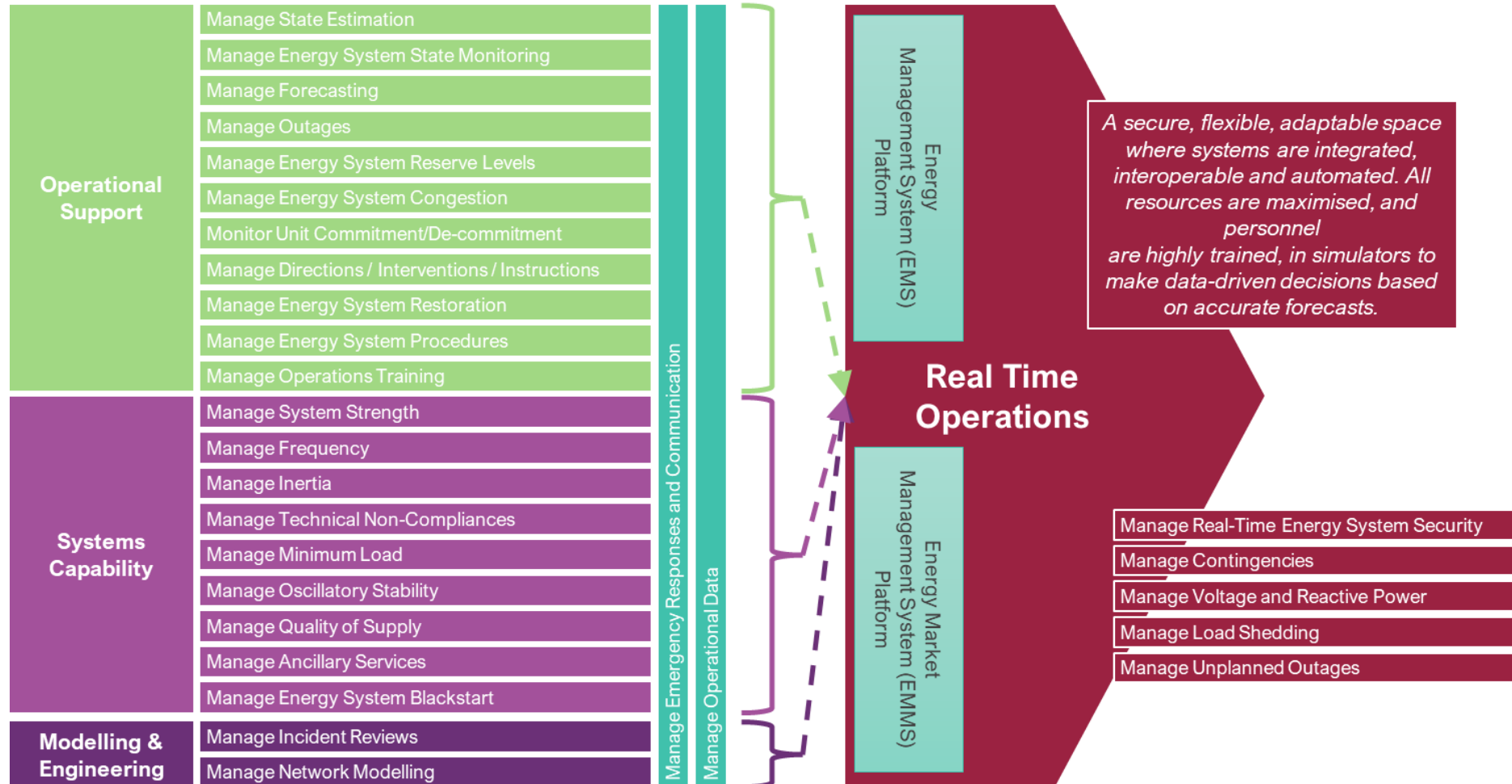


Purpose

Secure, reliable, resilient, safe and flexible operations, which facilitate a goal of 100% renewable operation

Control Room of the Future (CROF)

Secure, reliable, resilient, safe and flexible operations, which facilitate a goal of 100% renewable operation

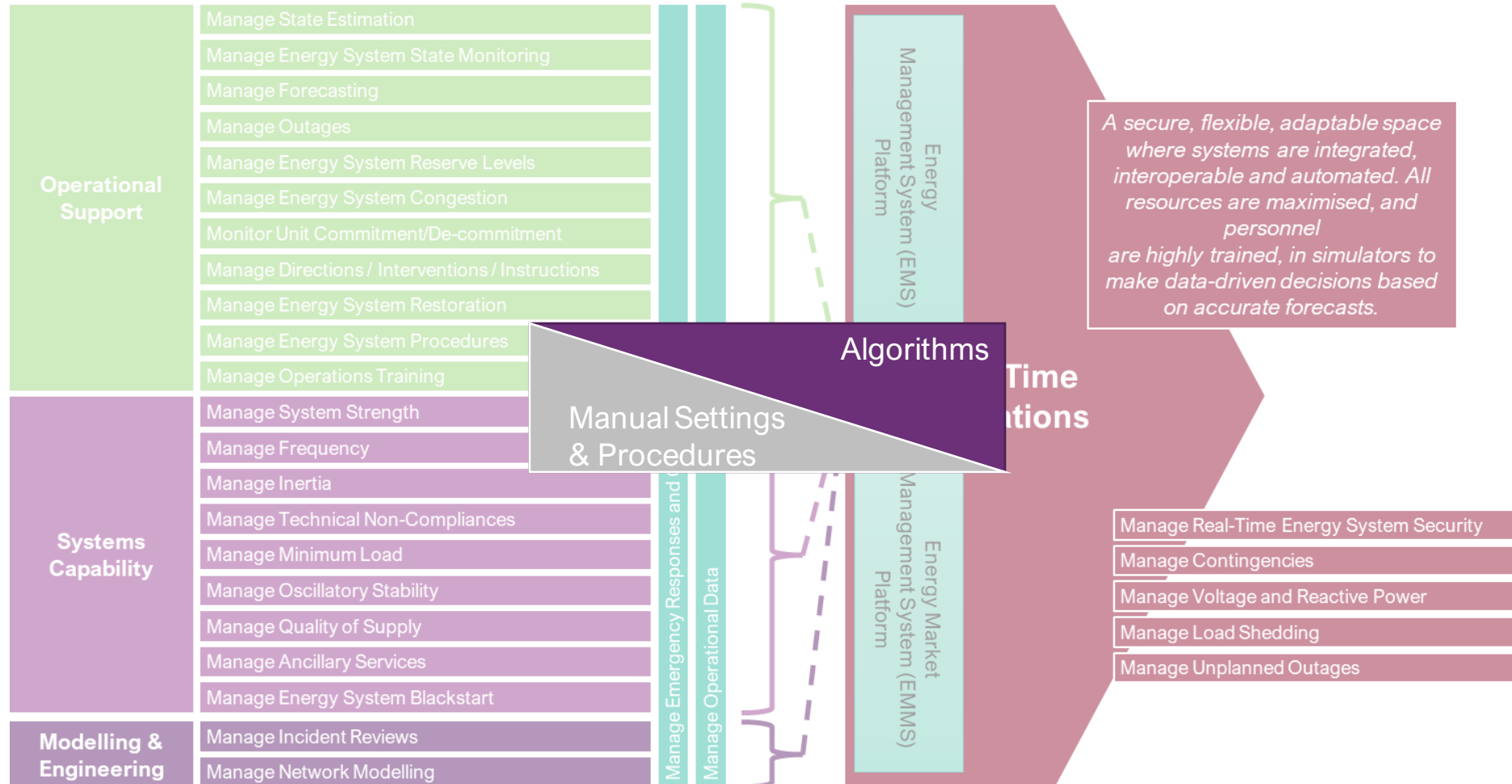


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Aligning our Capabilities to an integrated Future Mode of Operation

Control Room of the Future (CROF)

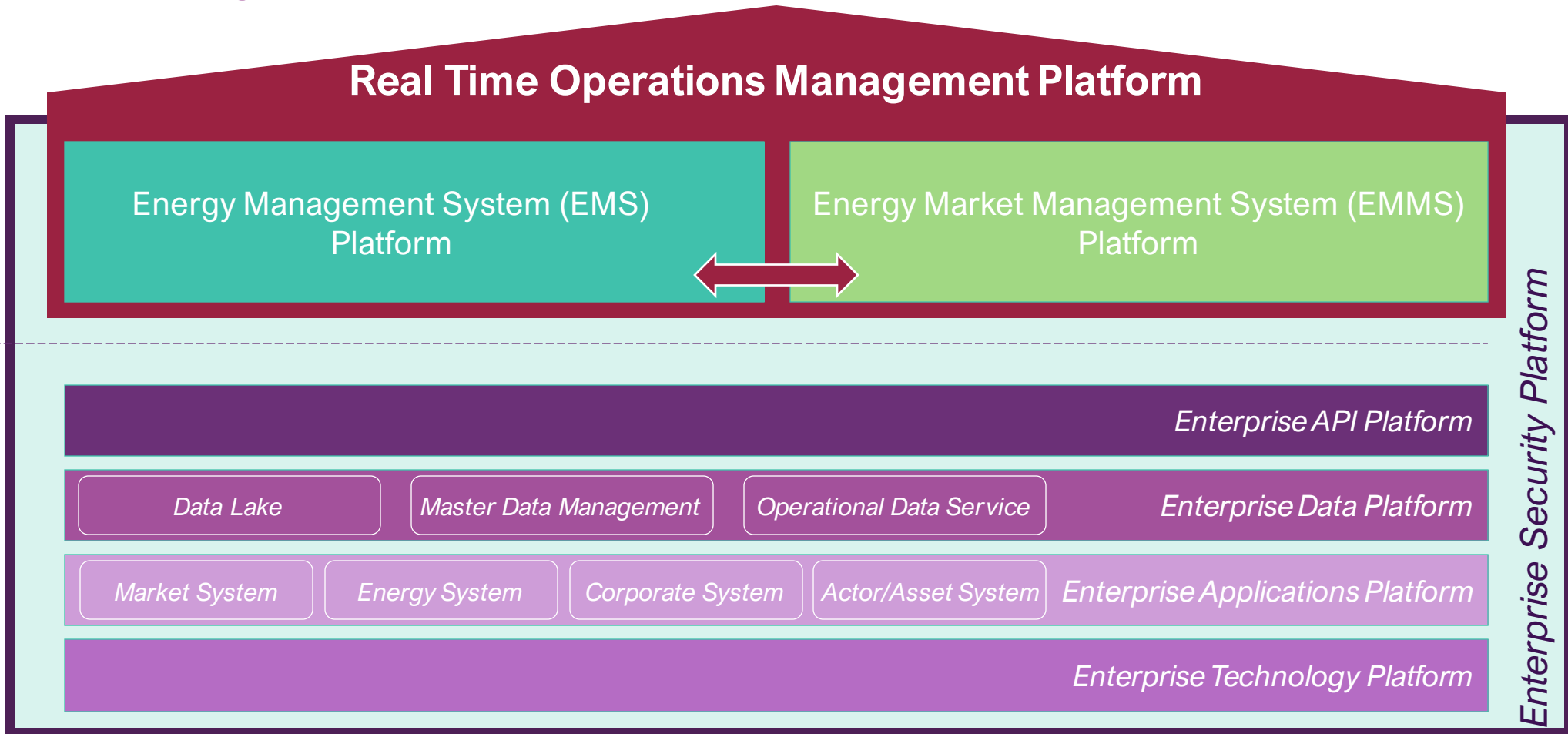
Secure, reliable, resilient, safe and flexible operations, which facilitate a goal of 100% renewable operation



The trend over time must be a reduction in manual activities as we increase our use of algorithms and automation

Real Time Operations Management Platform

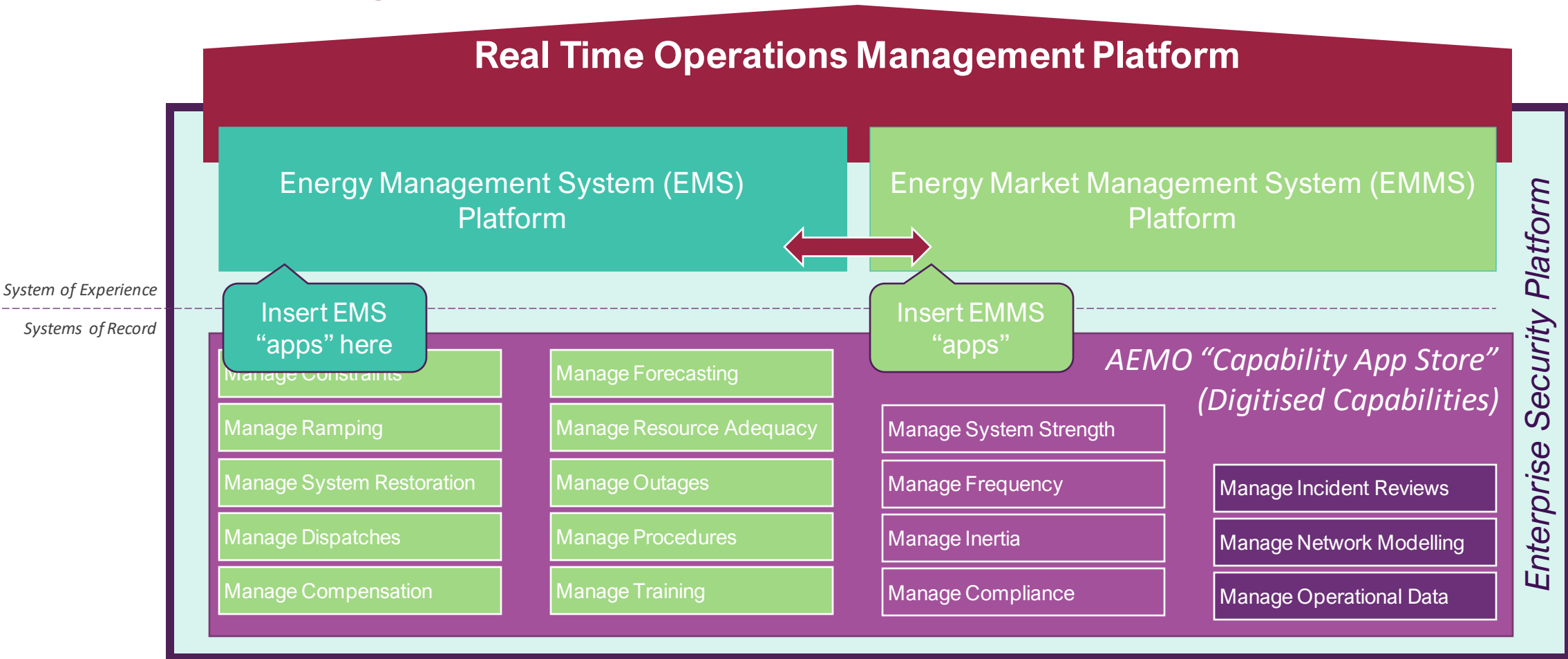
Conceptual Design



Aligning with Digital, we can quickly bring the vision to life based on the work products developed in the Operations Decision Making Tools project.

Real Time Operations Management Platform

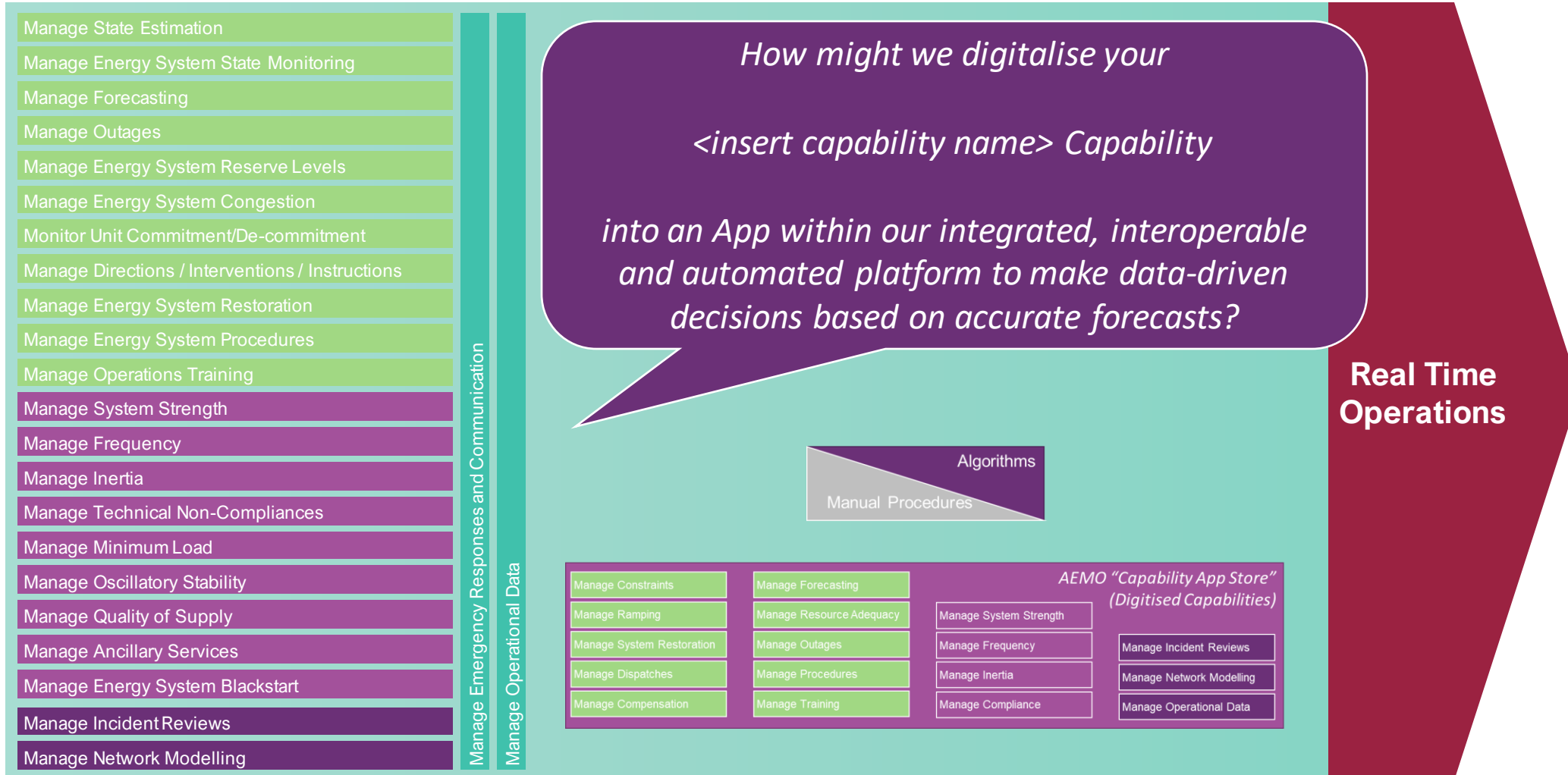
Conceptual Design



How might we digitalise critical capabilities and serve that into the Real Time Operations Management Platform. Working together, we are in the process of determining which capabilities are the most important.

Operations Technology Program

Capability Transformation Objective



Operations Technology Program

FY23/24 Major Projects

Manage Energy Market Systems Platform	Manage Real-Time Energy System Security	Manage Forecasting Supply & Demand	Manage Energy System Reserve Levels	Manage Oscillatory Stability	Manage Network Modelling
Real Time Operations Management Platform (P1934) Replace a range of unsupported complex systems with a contemporary Electricity Market Management System (EMMS).	NEM/WEM Energy Management System (EMS) Upgrade (P2205) Partnering with GE to upgrade our existing EMS to take advantage of new capabilities being brought to market	Forecasting Platform (P2046) Uplift our ability to forecast supply & demand across an increasing number of Distributed Energy Resources (DERs) & changing weather patterns.	ST-PASA Replacement (P1608) Uplift our ability to forecast energy resource levels & assess system adequacy.	Phasor Management Units (PMU) Monitoring Platform (P1920) Deploy PMUs with NSPs to detect small signal disturbances caused by Inverter Based Resources	Power System Modelling Uplift (P1828, P2332) A suite of initiatives that will uplift power system modelling capability, practices and tools
Operational Data Management Platform (ODMP) - P2160 Building a platform to better secure, govern, maintain and serve our real time data for our systems and scientists.					



For more information visit

aemo.com.au