

# Operations Technology Program

AEMC Overview  
14<sup>th</sup> March 2023

We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture.

**We pay respect to their Elders past, present and emerging.**

# About AEMO

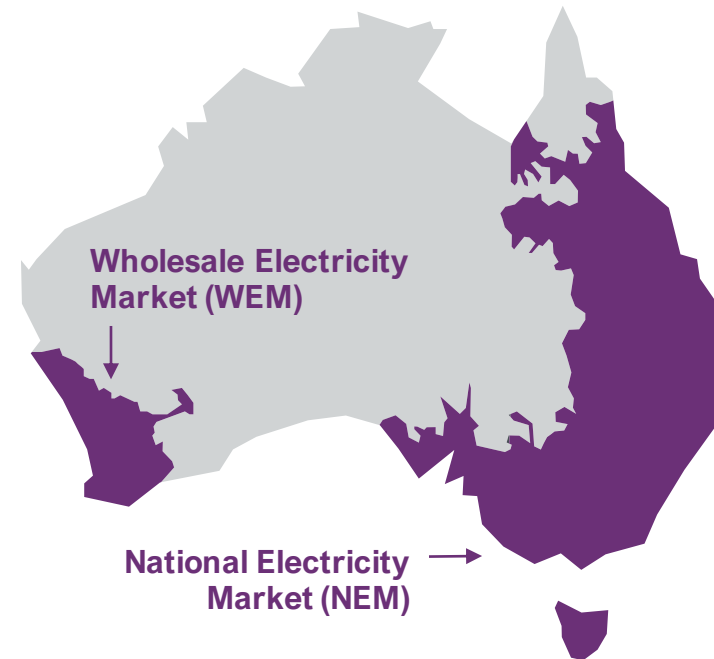
- AEMO is a member-based, not-for-profit organisation.
- We are the independent energy market and system operator and system planner for the National Electricity Market (NEM) and the WA Wholesale Electricity Market (WEM).
- We also operate retail and wholesale gas markets across south-eastern Australia and Victoria's gas pipeline grid.



AEMO Services is an independent subsidiary of AEMO, established in 2021 to enable the transparent provision of advisory and energy services to National Electricity Market jurisdictions.



## Electricity



## Gas



Declared Wholesale Gas Market (DWGM)

Short Term Trading Market (STTM) and Gas Supply Hub (GSH)

# 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.

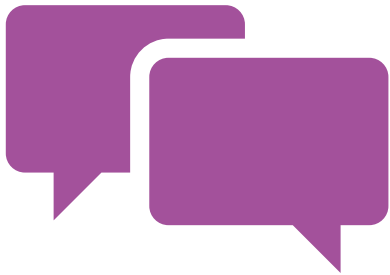
# A Critical Decade of Change

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

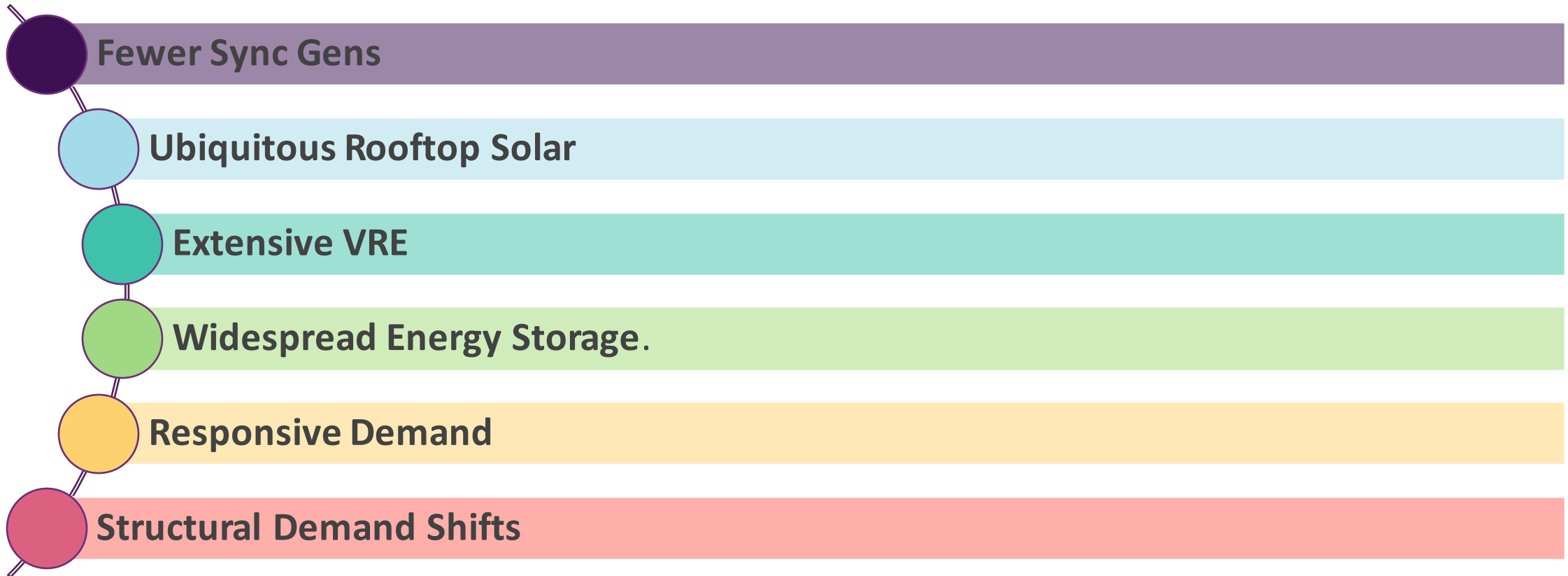
*“It is a stunning democratisation of power.”*

*“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.”



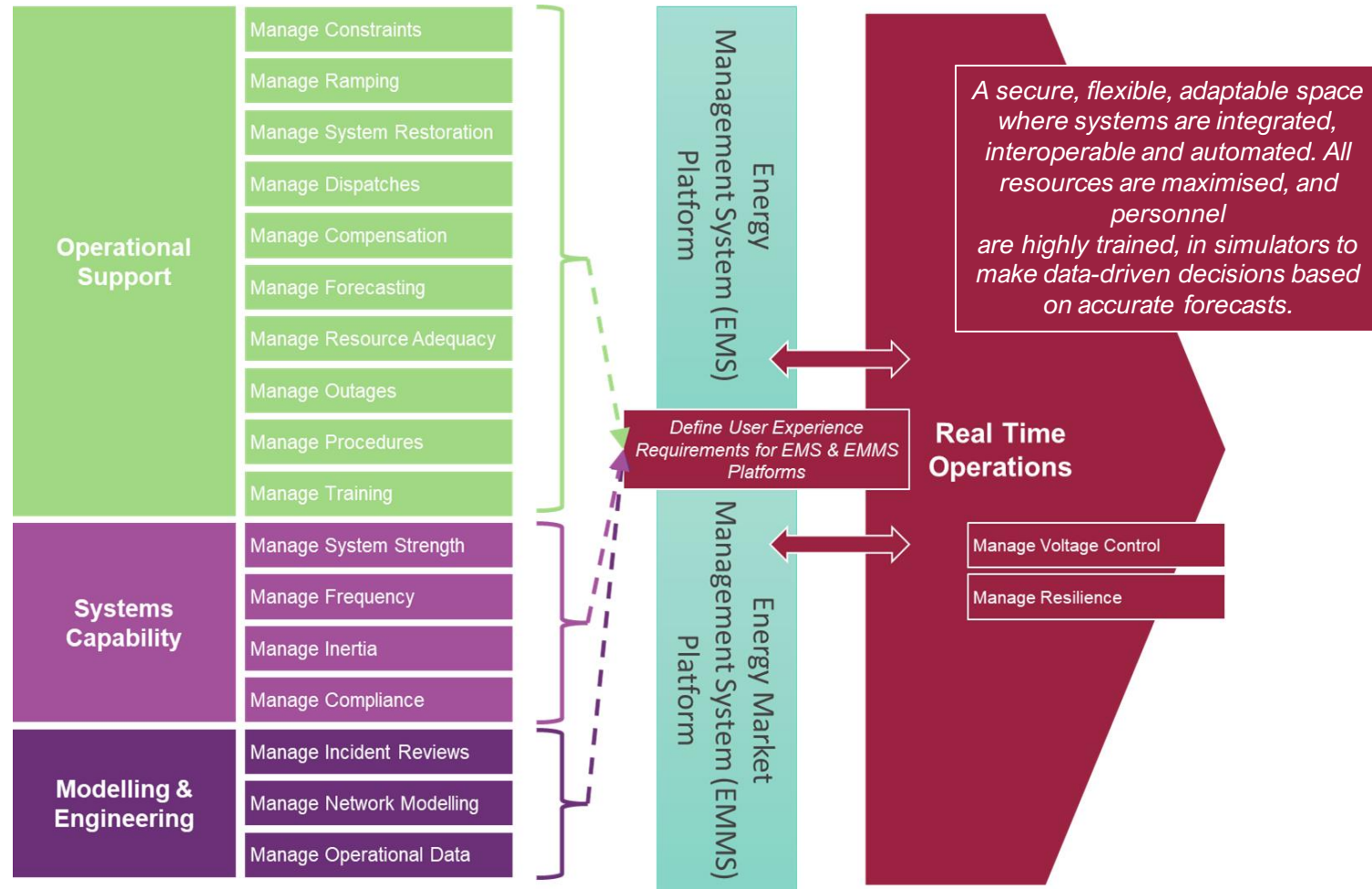
## Purpose

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



# Control Room of the Future (CROF)

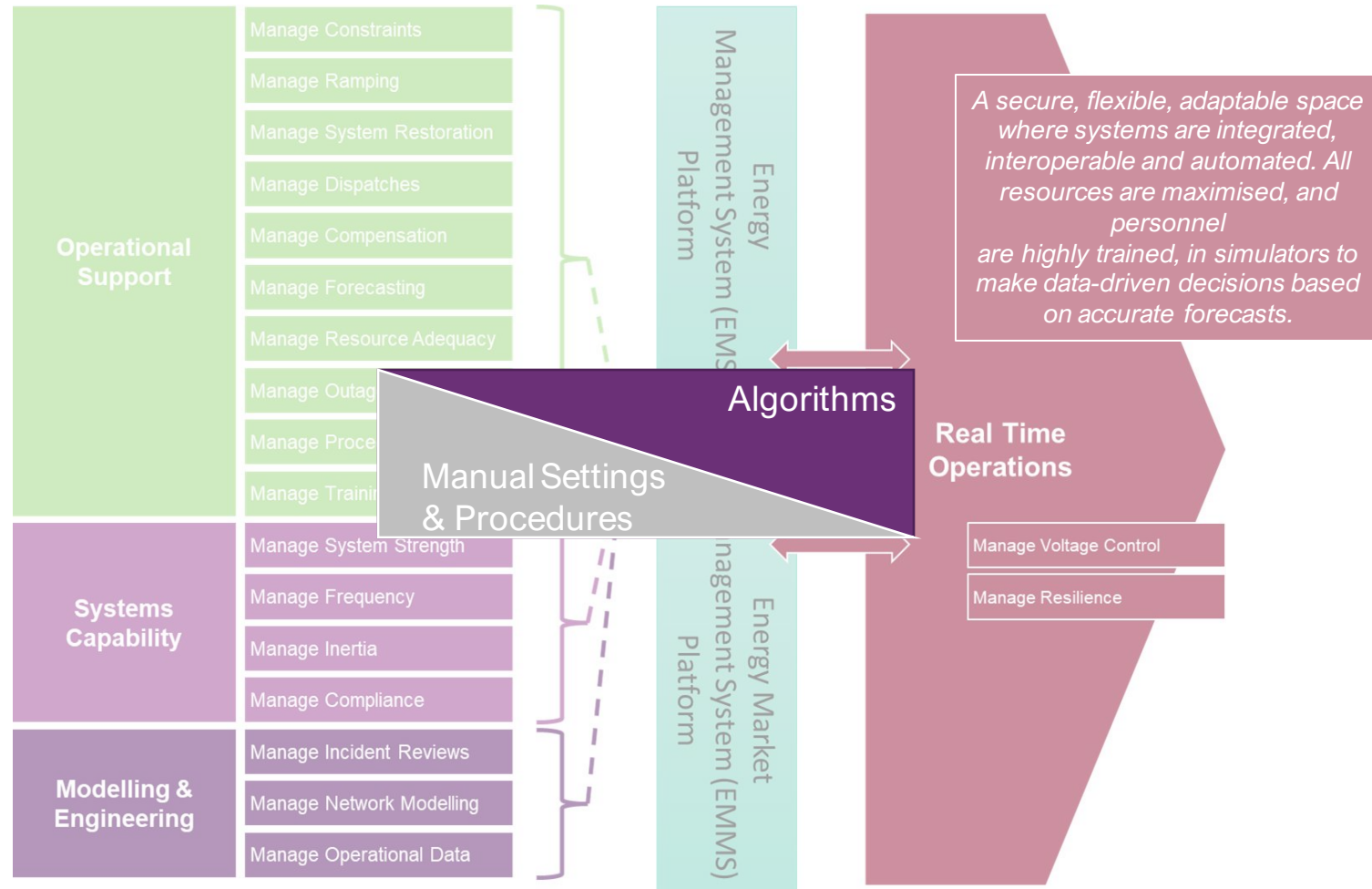
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**Aligning our Capabilities to an integrated Future Mode of Operation**

# Control Room of the Future (CROF)

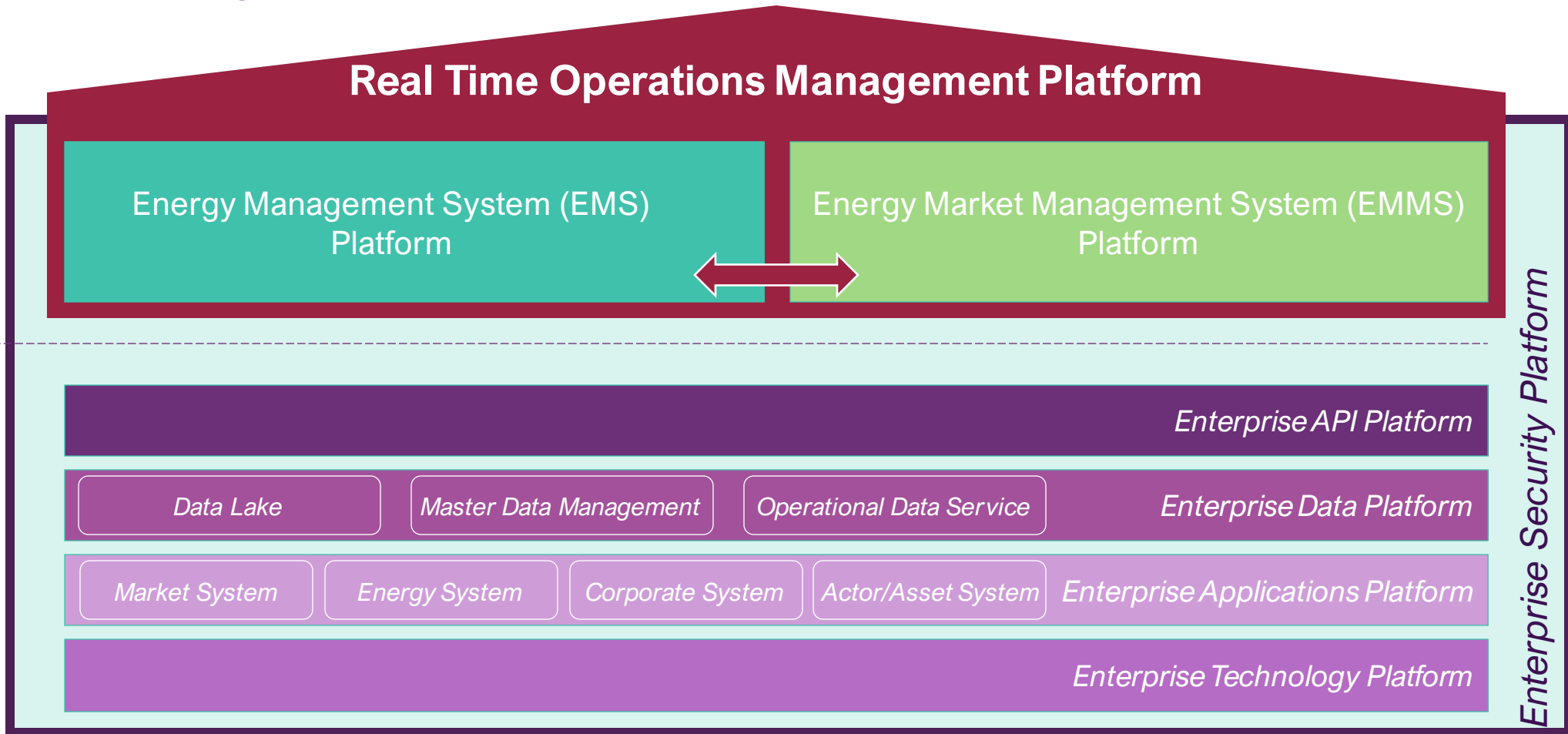
Secure, reliable, resilient, safe and flexible operations, which facilitate a goal of 100% renewable operation



*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

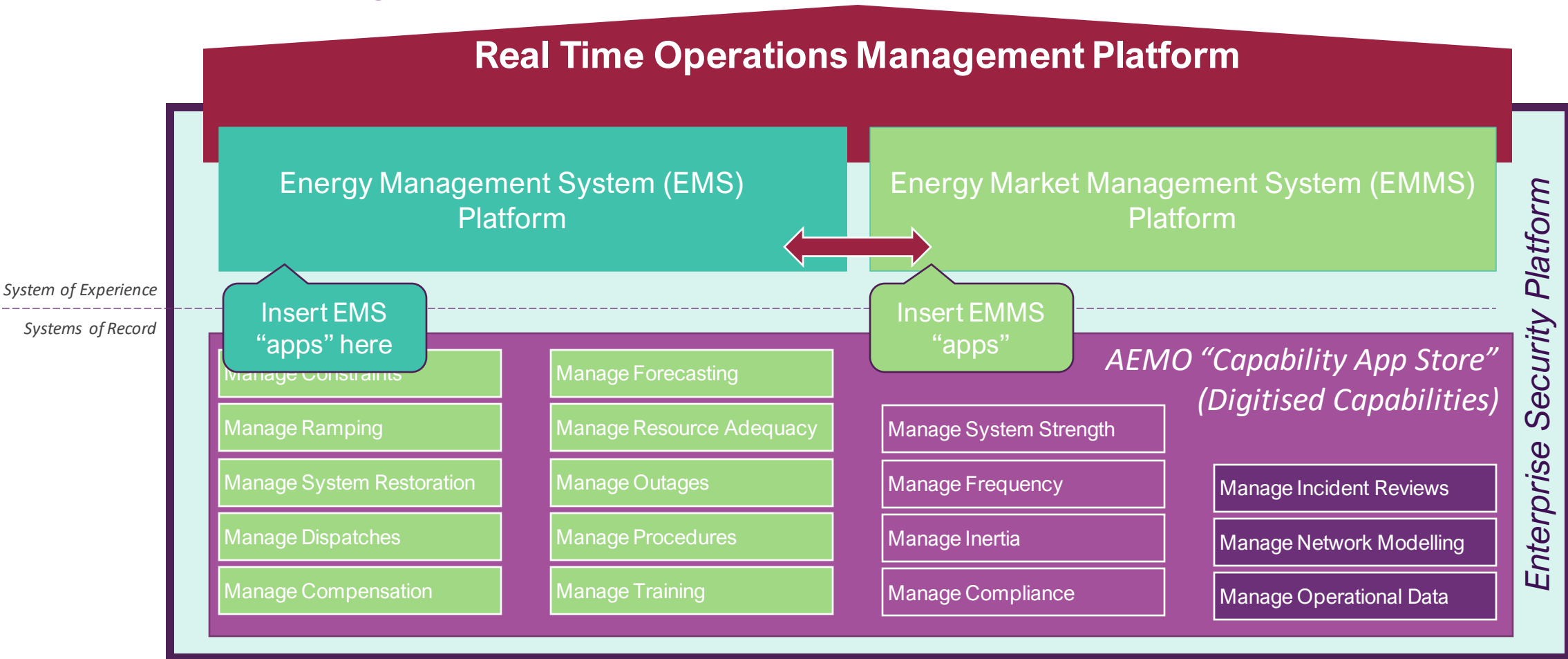
## Conceptual Design



*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.*

# Real Time Operations Management Platform

Self Service Apps to Improve Operator Agility & Experience

## Real Time Operations Management Platform

Energy Management System (EMS)  
Platform

Energy Market Management System (EMMS)  
Platform

System  
Strength  
App

Inertia  
App

Constraints  
App

Operator Dashboard

Insert EMS  
apps here

Insert EMMS  
apps here

Manage Constraints

Manage Ramping

Manage System Restoration

Manage Dispatches

Manage Compensation

Manage Forecasting

Manage Resource Adequacy

Manage Outages

Manage Procedures

Manage Training

Manage System Strength

Manage Frequency

Manage Inertia

Manage Compliance

AEMO "Capability App Store"  
(Digitised Capabilities)

Manage Incident Reviews

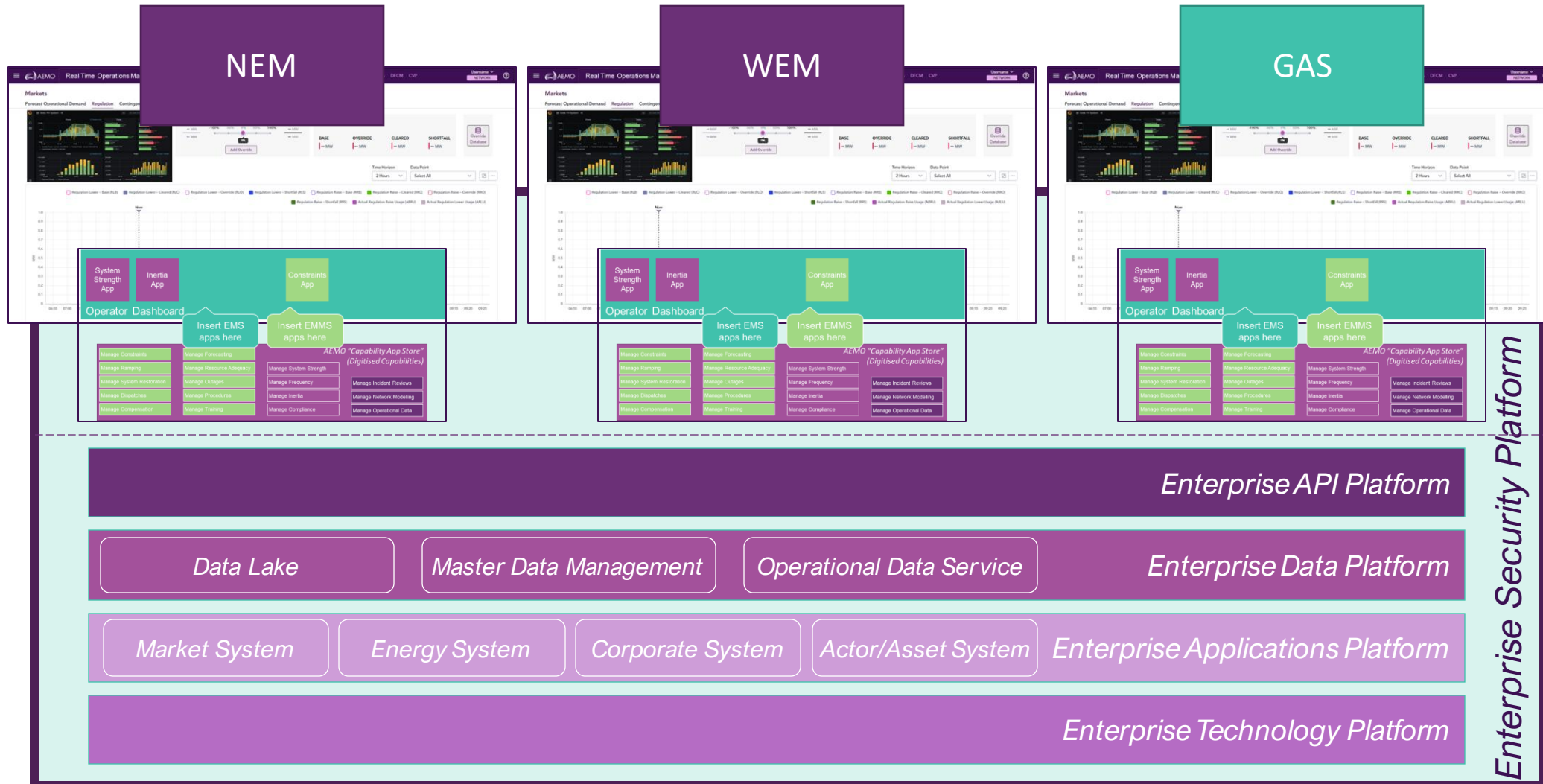
Manage Network Modelling

Manage Operational Data

System of Experience  
Systems of Record

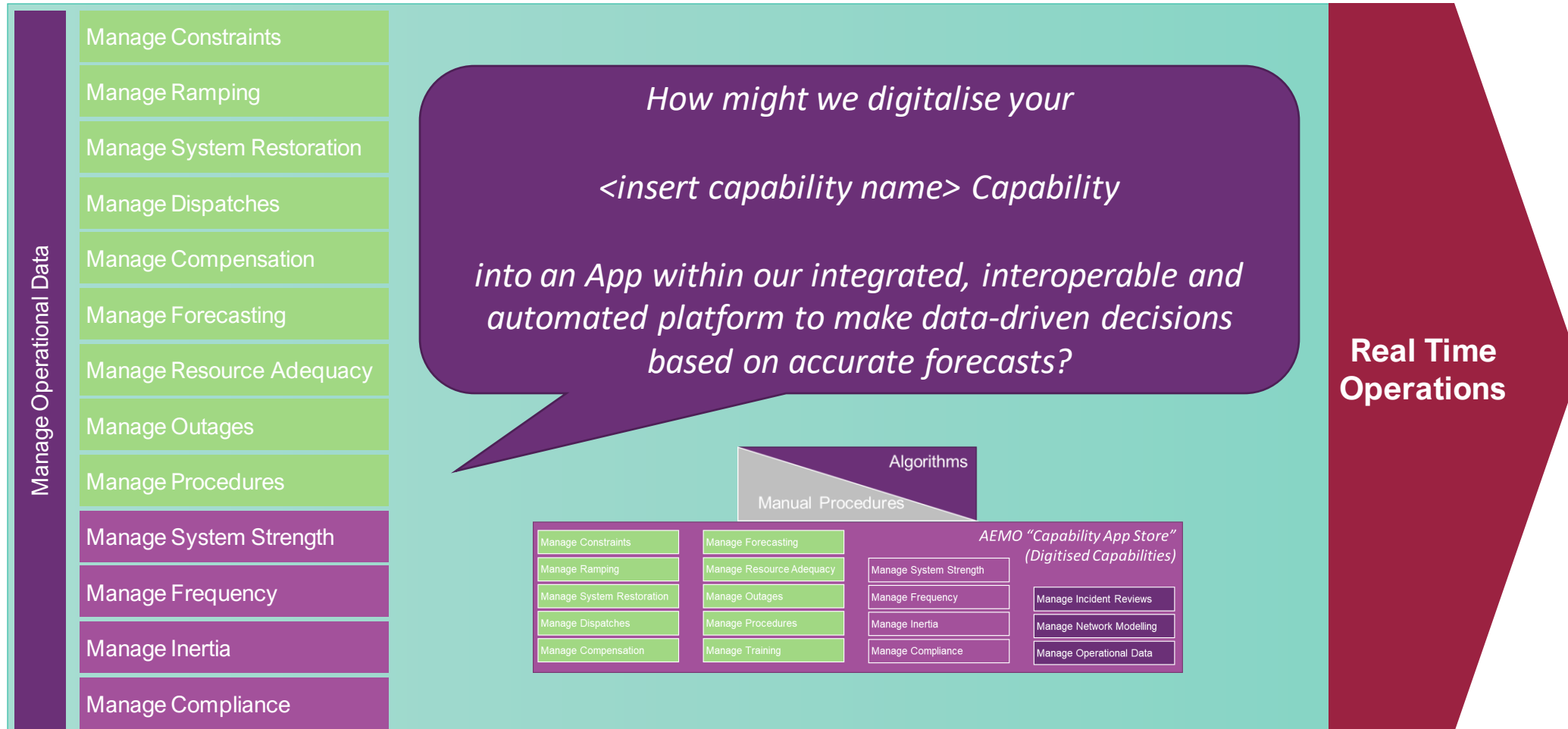
# Real Time Operations Management Platform

And the vision would be that the Platform serve all Real Time Operations



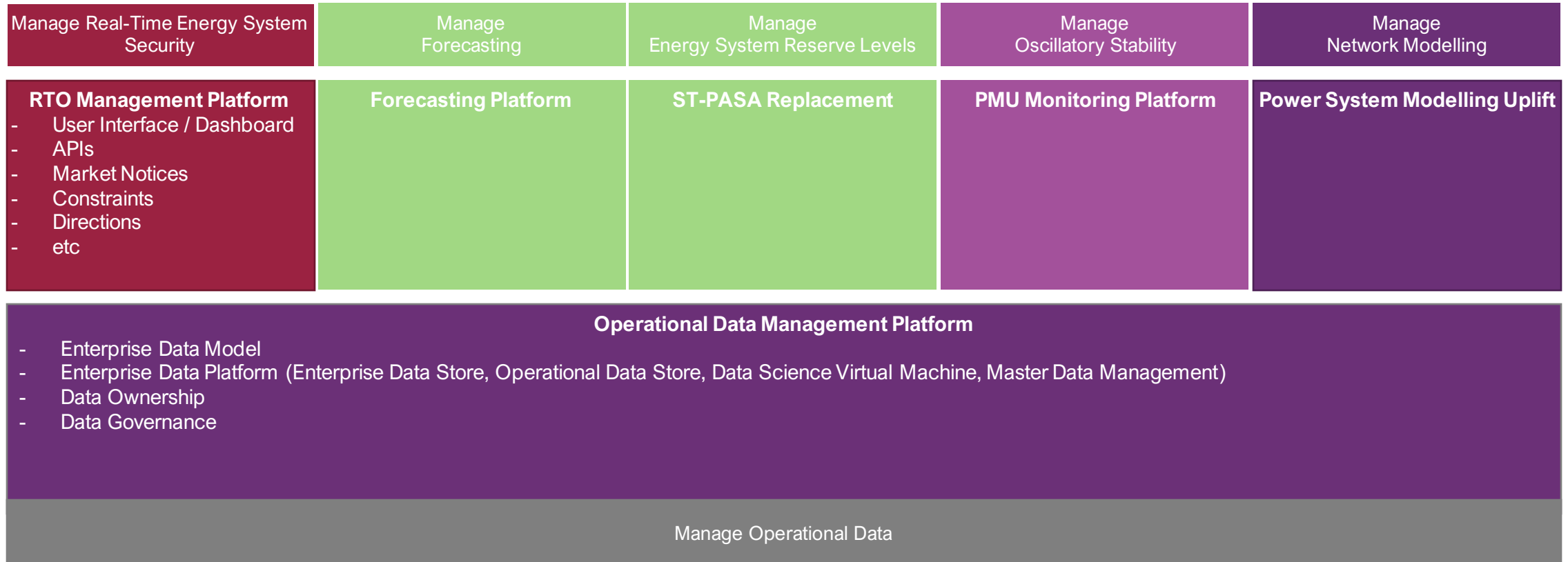
# Operations Technology Program

## Capability Transformation Objective



# Operations Technology Program

## FY23/24 Major Projects







For more information visit

[aemo.com.au](http://aemo.com.au)