

Reform Delivery Committee

Workshop 1 – 13 December 2021
Resource Adequacy Mechanisms, Essential System
Services and Transmission & Access



1. Introduction
2. Resource Adequacy Mechanisms
3. Essential System Services
4. Transmission & Access
5. Next Steps



1. Introduction

The “NEM2025 Implementation Roadmap” is to establish a basis upon which AEMO and stakeholders may navigate the breadth of ESB reforms over the coming few years, de-risking delivery and informing implementation timing

- In design of the NEM2025 Implementation Roadmap, the RDC aim to set out a program that:
 - Implements reforms in a timely and efficient manner
 - Co-ordinates regulatory and IT change
 - Provides transparency to stakeholders on the implementation program
- Following its inaugural meeting on 10 November, the RDC supported a workshop based approach over two rounds to develop V1 of the NEM2025 Implementation Roadmap
 - Round 1 (DEC 21): to understand the NEM2025 Initiatives and assess their impact
 - Round 2 (FEB 22): to assess bundling, sequencing and prioritisation pathways as part of Roadmap development

Round 1 Workshops

TODAY	Workshop 1 (13 DEC)	Workshop 2 (20 DEC)
	Resource Adequacy Mechanisms	Distributed Energy Resources
	Essential System Services	Data Strategy
	Transmission and Access	

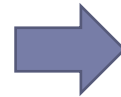
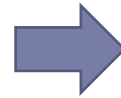
WORKSHOP OBJECTIVES

Understand implementation initiatives to support ESB Reforms

Understand pre-requisite initiatives

Consider and understand strategic or tactical initiatives to facilitate reform outcomes – improving efficiency or reducing pain points

Assess and understand implementation impacts and requirements for AEMO, participants, consumers



WORKSHOP APPROACH

- Overview of the reform workstream
- Identification of the implementation initiative and its relationship to the reform initiative
- Next level detail of the reform implementation initiative

- Identification and description of the pre-requisite (AEMO) initiatives

- Workshop discussion

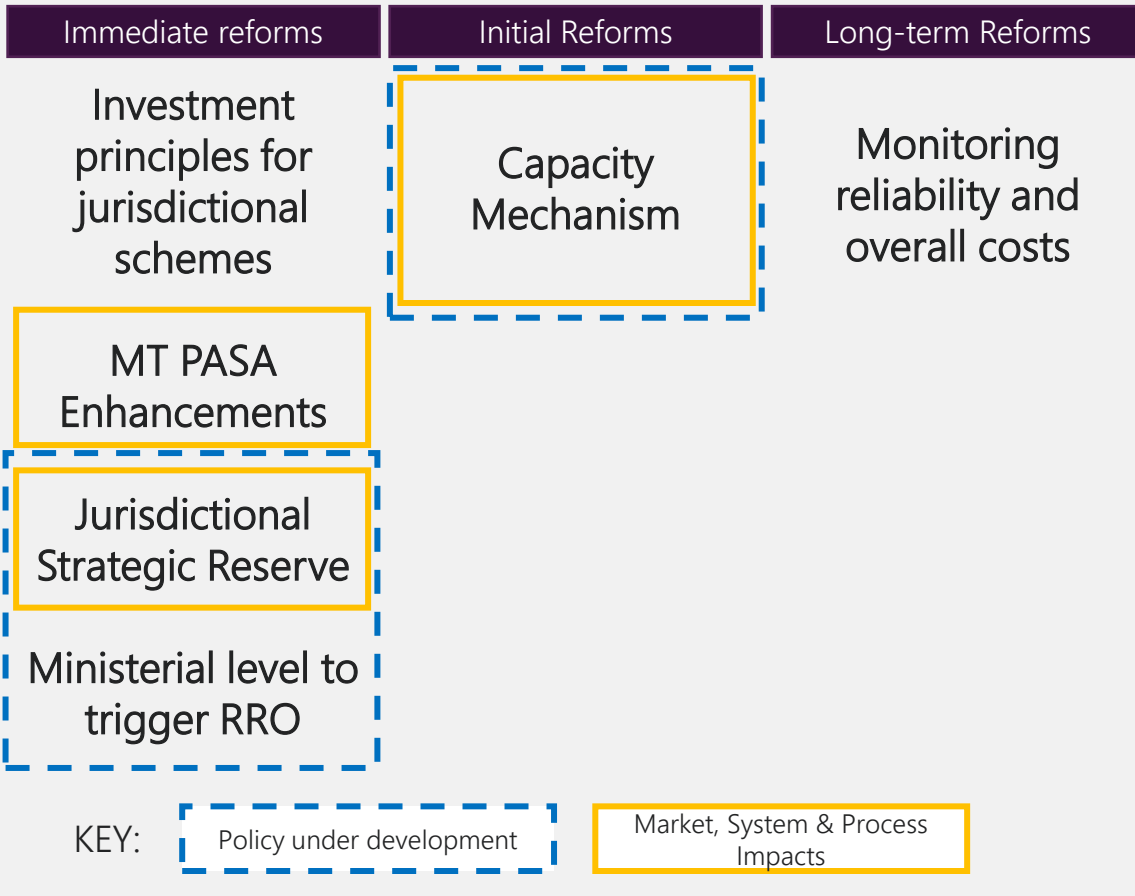
- AEMO initial impact assessment
- Workshop discussion

2. Resource Adequacy Mechanisms

Resource Adequacy Mechanisms

Reform Workstream Overview

REFORM WORKSTREAM



Objective:

- Establish new market-based arrangements to explicitly value capacity to provide an 'investable' and enduring long-term signal
- Establish market arrangements that support efficient allocation of investment risk between participants, jurisdictions, and consumers
- Establish tools that provide jurisdictions sufficient confidence that reliability will be maintained in a way that preserves market signals

This means:

- We have investment in the right mix of resources (generation, storage and demand response) in place prior to anticipated plant closures, and that plant exit does not cause significant price or reliability shocks to consumers through the transition

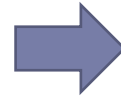
National Cabinet agreed or endorsed the ESB's final recommendations

- Only 2 of 6 reform initiatives recommended by the ESB under the RAMs workstream are anticipated to impact AEMO and/or market participants systems and processes
- Of the reform initiatives recommended AEMO propose the inclusion of *MT PASA Enhancements* initiative within version one of the Roadmap
- This reflects the policy uncertainty regarding design of a capacity mechanism and the ESB’s recommendation a Jurisdictional Strategic Reserve mechanism be established through existing Short Notice RERT

Reform Initiative	Status	System / Process Impacts	Inclusion in Roadmap (v1)	Comment
Investment principles for jurisdictional schemes	Completed	N/A	No	<ul style="list-style-type: none"> • Amended set of principles for jurisdictional investment schemes adopted on a non-binding basis
MT PASA Enhancements	Rule change	Yes	Yes	<ul style="list-style-type: none"> • Rule change request drafted proposing the establishment of reason codes and recall times within the MT PASA process – submission early Dec
Jurisdictional Strategic Reserve	Under policy development	No	No	<ul style="list-style-type: none"> • Current proposal aims to utilise existing RERT procedures. Further changes to AEMO systems unlikely, minor changes to processes (if any)
Ministerial RRO Trigger	Under policy development	No	No	<ul style="list-style-type: none"> • Jurisdictions to adopt a trigger as per current SA arrangements • ESB, State and Territories to progress with implementation
Capacity Mechanism	Under policy development	Yes	No	<ul style="list-style-type: none"> • To be included in subsequent versions of the Roadmap when design of mechanism is further advanced
Ongoing Monitoring	N/A	No	No	<ul style="list-style-type: none"> • No explicit change to existing systems/processes required

OVERVIEW

- Establish the reporting of a unit's status through reason codes via MT PASA
- Establish the reporting of recall times via MT PASA when triggered through a reason code



SCOPE

- Consultation on design and definition of reason codes
- IT related changes to AEMO / participant MT PASA systems / models, bidding interfaces and reports
- Updates to relevant AEMO / participant policies, processes, guidelines (e.g. RSIG and MT PASA Process Description)

AEMO Initial System / Process Impact Assessment

Reform initiative	Wholesale									Retail	DER	Other
	Registration	Offers	Dispatch	Constraints	PASA	Settlements Billing & Prudentials	Causar Pays	System operations	New			
MT PASA Enhancement												

QUESTIONS FOR COMMITTEE MEMBERS

What are the key impacts to participant systems and processes?

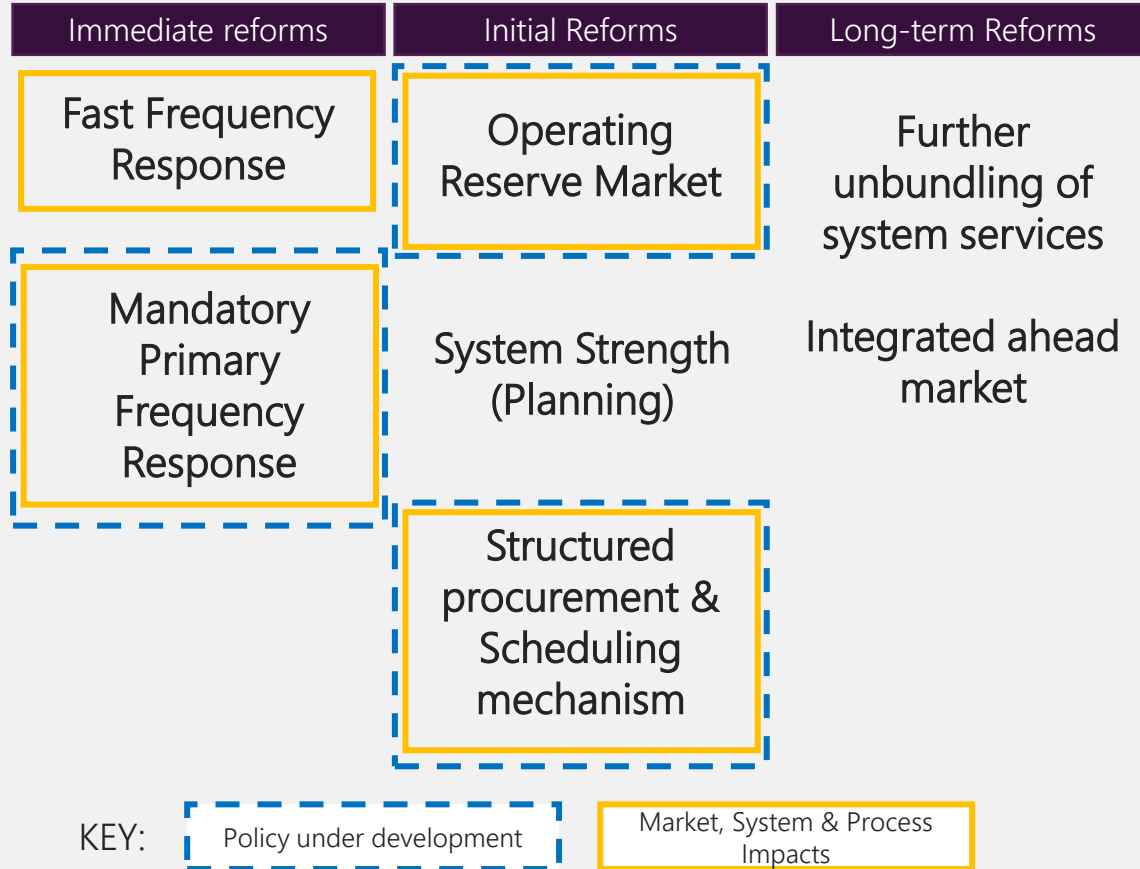
What are the key challenges and risks associated with the delivery of these reforms?

What time period would be required to implement?

Is this seen as a high complexity implementation?

3. Essential System Services

REFORM WORKSTREAM



Objective:

- Establish new market-based arrangements to value the services needed to support the changing mix of resources in the NEM (frequency, inertia, system strength, and operating reserves)
- Establish new market mechanisms to support efficient scheduling and dispatch by AEMO
- Deliver a range of supply and demand-based technologies and resources with capabilities to deliver these essential services

This means:

- We have the resources and services when needed to manage the complexity of dispatch and to deliver a secure supply to customers

These immediate and initial reform initiatives are the subject of open (or recently closed) rule changes being progressed by the AEMC

- All reform initiatives recommended by the ESB under the ESS workstream are anticipated to impact AEMO and/or market participants systems and processes. As a result AEMO propose the *inclusion four of the seven initiatives* within version one of the Roadmap
- In formulation of the Roadmap, the RDC will need to be mindful of the policy uncertainty across various rule changes driving each initiative. For example, the AEMC has announced an 18 month delay to the OR Market rule change process given policy uncertainty and need for further quantitative analysis

Reform Initiative	Status	System / Process Impacts	Inclusion in Roadmap (v1)	Comment
Fast Frequency Response	Final determination	Yes	Yes	<ul style="list-style-type: none"> • Final determination made Jul 2021 establishing two new market ancillary service categories; very fast raise and very fast lower. Implementation Oct 2023
Mandatory Primary Frequency Response	Draft determination	Yes	Yes	<ul style="list-style-type: none"> • Continuation of mandatory primary frequency response requirements beyond June 2023 sunset • It is proposed Roadmap v1 to align with draft determination until a final is made (likely mid 2022)
Operating Reserve Market	Rule change open	Yes	Yes	<ul style="list-style-type: none"> • Draft determination extended to 30 Jun 2023 to allow further consideration and design • It is proposed Roadmap v1 to align with 'Co-optimised availability market' option as per the directions paper until further design and assessment has been completed
System Strength (Planning)	Final determination	Yes	No	<ul style="list-style-type: none"> • Final determination made Oct 2021. As system / process impacts target transmission network service providers only it is proposed this initiative be excluded from Roadmap v1- tbc
Structured procurement & Scheduling Mechanism	Directions paper	Yes	Yes	<ul style="list-style-type: none"> • AEMC directions paper highlighted spectrum of possible approaches to valuing, scheduling, and procuring security services operationally. Draft determination scheduled July 2022. • It is proposed Roadmap v1 to align ESB final paper (Unit Commitment for Security (UCS) + System Security Mechanism (SSM))
Unbundling system services (e.g. inertia)	Early policy consideration	No	No	<ul style="list-style-type: none"> • No explicit change to existing systems/processes required at this time
Integrated ahead market	Early policy consideration	No	No	<ul style="list-style-type: none"> • No explicit change to existing systems/processes required at this time

OVERVIEW

- Introduce two new FCAS markets / products (very fast raise / very fast lower) to help control system frequency under lower system inertia conditions
- AEMO to revise the market ancillary service arrangements by Jan 2023 to allow market start by Oct 2023



SCOPE

- Develop and consult on FFR Market Ancillary Service Specification (MASS)
- IT related changes to AEMO / participant FCAS systems / models, bidding interfaces and reports (e.g. NEMDE, EMS, Market & Settlement Systems)
- Updates to relevant AEMO / participant policies, processes, guidelines

AEMO Initial System / Process Impact Assessment

Reform initiative	Wholesale									Retail	DER	Other
	Registration	Offers	Dispatch	Constraints	PASA	Settlements Billing & Prudentials	Causar Pays	System operations	New			
Fast Frequency Response	Yellow	Yellow	Yellow	Yellow	Green	Yellow	Green	Yellow	Green	Green	Green	Green

QUESTIONS FOR COMMITTEE MEMBERS

What are the key impacts to participant systems and processes?

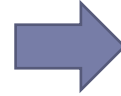
What are the key challenges and risks associated with the delivery of these reforms?

Are implementation time pressures seen in achieving Oct 2023?

Is this seen as a high complexity implementation?

OVERVIEW

- Continuation of mandatory PFR requirements beyond the June 2023 sunset date i.e. going forward all scheduled and semi-scheduled generators will be required to provide PFR
- AEMC draft determination 1) confirm enduring mandatory arrangements and ii) establish an updated framework for frequency performance payments



SCOPE

- Develop and consult on frequency contribution factors procedure and final PFR requirements
- IT related changes to AEMO / participant systems / models and reports (e.g. NEM Settlements, causer pays calculation engine)
- Updates to relevant AEMO / participant policies, processes, guidelines

AEMO Initial System / Process Impact Assessment

Reform initiative	Wholesale									Retail	DER	Other
	Registration	Offers	Dispatch	Constraints	PASA	Settlements Billing & Prudentials	Causer Pays	System operations	New			
Mandatory Primary Frequency Response	Yellow	Green	Green	Green	Green	Yellow	Orange	Green	Green	Green	Green	Green

QUESTIONS FOR COMMITTEE MEMBERS

What are the key impacts to participant systems and processes?

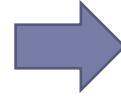
What are the key challenges and risks associated with the delivery of these reforms?

What time period would be required to implement?

Is this seen as a high complexity implementation?

OVERVIEW

- An OR market would unbundle reserves from energy to separately value flexible, responsive resources, through one or more new markets, and in doing so provide a separate and explicit signal for their provision
- AEMC draft determination extended to June 2023 to allow for consideration of further technical advice from AEMO, additional data on market operation under 5MS, and understanding of related ESB reforms



SCOPE

- Scope subject to ongoing consultation on possible design, rules and implementation options
- IT related changes to AEMO / participant systems / models, bidding interfaces / settlement and cost-recovery processes (e.g. bidding interface, NEMDE, operational tools / interfaces, settlement, MASS)
- Updates to relevant AEMO / participant policies, processes, guidelines

AEMO Initial System / Process Impact Assessment

Reform initiative	Wholesale									Retail	DER	Others
	Registration	Offers	Dispatch	Constraints	PASA	Settlements Billing & Prudentials	Causer Pays	System operations	New			
Operating Reserve Market	Yellow	Yellow	Yellow	Green	Green	Yellow	Green	Yellow	Yellow	Green	Green	Green

QUESTIONS FOR COMMITTEE MEMBERS

What are the key impacts to participant systems and processes?

What are the key challenges and risks associated with the delivery of these reforms?

What time period would be required to implement?

Is this seen as a high complexity implementation?

OVERVIEW

- Develop market-based solution to procure system services in operational timeframe and tool to schedule the system services that have been contracted in the planning timeframes
- AEMC direction paper highlighted two categories of possible approaches; a **non-market ancillary services (NMAS) approach**, which sees an additional solver and process run close to real-time, or a **market ancillary services (MAS) approach**, which sees a new service introduced or modifications to the NEM dispatch engine



SCOPE

- Scope subject to ongoing consultation on possible design, rules and implementation options, including required prototype and trial approaches.
- IT related changes to AEMO / participant systems / models, bidding interfaces / settlement and cost-recovery processes (e.g. new solver engine, NEMDE, operational tools / interfaces, settlement, billing and prudentials)
- Updates to relevant AEMO / participant policies, processes, guidelines

AEMO Initial System / Process Impact Assessment

Reform initiative	Wholesale									Retail	DER	Other
	Registration	Offers	Dispatch	Constraints	PASA	Settlements Billing & Prudentials	Causer Pays	System operations	New			
Structured procurement & Scheduling mechanism	Green	Green	Green	Green	Green	Yellow	Green	Orange	Orange	Green	Green	Green

QUESTIONS FOR COMMITTEE MEMBERS

- What are the key impacts to participant systems and processes?
- Other impacts (such as commercial) are likely, do these need to be mapped?
- What are the key challenges and risks associated with the delivery of these reforms?
- What time period would be required to implement?
- Is this seen as a high complexity implementation?

OVERVIEW

- A new transmission standard for system strength and TNSP-led procurement to provide efficient levels of system strength on a forward looking basis
- A charging mechanisms where connecting parties have a choice between paying to use system strength provided by the TNSP or providing their own by remediating their impact
- New access standards for relevant generators, loads and market network service providers ensuring they use an efficient amount of system strength



SCOPE

- Supply side arrangements commence December 2022; Demand side and coordination arrangements commence March 2023
- AEMO to develop and consult on system strength assessment documentation. No AEMO IT related impacts identified
- Responsible TNSPs to adapt processes and procure to meet system strength standard

AEMO Initial System / Process Impact Assessment

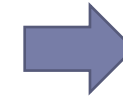
Reform initiative	Wholesale									Retail	DER	Other	
	Registration	Offers	Dispatch	Constraints	PASA	Settlements Billing & Prudentials	Causar Pays	System operations	New				
System Strength (Planning)													

QUESTIONS FOR COMMITTEE MEMBERS

- What are the key impacts to participant systems and processes?
- What are the key challenges and risks associated with the delivery of these reforms?
- What time period would be required to implement?
- Do Committee members believe such initiatives should be included in the Roadmap?

Overview

P1934	Operational Decision-Making Tools	A refresh of the user interfaces used by the AEMO control room operators. Multiple disparate UI converged into single user experience platform
P2280	Dispatch Target State	A technology uplift of AEMO backend market platform services to replace legacy technology. In the case of bids/offers this will leverage SMS deliverables
P2281	Bids offers target state	
P2282	Constraint target state	
P2263	Forecasting Platform Uplift	A converged modelling platform that supports model development, interfaces for forecasting-as-a-service providers and layered blended models across a number of modelling domains e.g. demand and VRE



SCOPE

- Enable AEMO Control Room to maintain operational functions in an increasingly complex system management environment
- Technology life cycle upgrade of end of life core market dispatch/bidding/constraint platforms
- Enable more sophisticated forecasting models to optimise procurement of ESS services

AEMO Initial System / Process Impact Assessment

Reform initiative	Wholesale									Retail	DER	Other
	Registration	Offers	Dispatch	Constraints	PASA	Settlements Billing & Prudentials	Causar Pays	System operations	New			
Dependent Initiatives												

QUESTIONS FOR COMMITTEE MEMBERS

Are significant impacts to participant systems and processes foreseen, or are these initiatives internal to AEMO?

Do Committee members have specific pain points in these areas that should be considered?

Do Committee members believe such initiatives should be included in the Roadmap?

4. Transmission & Access

REFORM WORKSTREAM

Immediate reforms	Initial Reforms	Long-term Reforms
Dedicated connection assets and system strength	<div style="border: 2px dashed blue; padding: 5px;"> Transmission Access Reform </div>	Locational marginal pricing and financial transmission rights
Interim REZ framework	Transmission Planning and Investment Review	
	Enhanced congestion information	
<p>KEY: Policy under development Market, System & Process Impacts</p>		

Objective:

- Establish better signals for generators to locate in areas where there is available generation capacity - namely in the REZs
- Reduced uncertainty for investors, through measures that give rise to more predictable future patterns of congestion, and a more orderly and predictable connections process
- Establish better use of the network, resulting in more efficient dispatch outcomes and lower costs for consumers
- Ensure batteries are locating where they are needed most and being paid to operate in ways that benefit the broader system

This means:

- We have a network to meet future needs, renewable energy zones, and a targeted set of investments that can deliver the energy transition at lower cost

Assessment of the T&A immediate and initial reforms are being considered via AEMC reviews or rule changes, the ESB or AEMO

- As noted, immediate and initial reforms are being considered via a range of processes including AEMC reviews or rule changes, the ESB design and consultation or AEMO. In certain cases these initiatives have been completed or reached their final determination
- Others, such as Transmission Access Reform are subject to ongoing detailed design work
- Given the status of each reform initiative AEMO propose *not to include any of the initiatives* within version one of the Roadmap

Reform Initiative	Status	System / Process Impacts	Inclusion in Roadmap (v1)	Comment
Dedicated connection assets & system strength	Final Determination	Yes	No	<ul style="list-style-type: none"> • Final determination made in Aug 2021 and Oct 2021. • As system / process impacts target transmission network service providers only it is proposed this initiative be excluded from Roadmap v1
Interim REZ framework	Completed	No	No	<ul style="list-style-type: none"> • National Cabinet has endorsed ESB' interim framework setting out principles relating to planning, connections, funding and economic regulation, and access in a REZ
Transmission Access Reform	Under policy development	Yes	No	<ul style="list-style-type: none"> • Overall direction of CMM expected to be clearer in the March-May timeframe following initiation of a detailed design phase by the ESB in late Nov 2021. It is proposed that this initiative therefore be included in Roadmap v2 at that time
Transmission Planning & Investment Review	Consultation Paper	No	No	<ul style="list-style-type: none"> • AEMC consultation paper published Aug 2021; aim to identify issues, reform and/or improvement options to existing regulatory framework
Enhanced congestion information	Completed	Yes	No	<ul style="list-style-type: none"> • AEMO has completed its consultation on its Congestion Information Resource Guidelines with new obligations on the provision of information from TNSPs. It is proposed this initiative be excluded from Roadmap v1
LMP & FTR	N/A	N/A	N/A	<ul style="list-style-type: none"> • Not under consideration due to ongoing consideration of CMM

Implementation Impacts

Summary Market and System Operations Impacts

- AEMO’s initial assessment shows some systems are heavily impacted by multiple reforms – key functions include registration, settlements and system operation tools and interfaces
- Many of the changes will require:
 - Consideration of the lifecycle state of the underlying systems
 - Coordination and need to be sequenced / bundled for efficient delivery
- AEMO anticipate similar impacts to participants systems and processes

A potentially useful tool to understand and represent participant or consumer impacts could be a similar (high-level) business function framework by participant/consumer type?

Workstream	Reform initiative	Wholesale								New	Retail	DER	Others
		Registration	Offers	Dispatch	Constraints	PASA	Settlements Billing & Prudentials	Causar Pays	System operations				
RAM	Increased MTPASA information	Green	Green	Green	Green	Yellow	Green	Green	Green	Green	Green	Green	Green
ESS	Operating Reserve Market	Yellow	Yellow	Yellow	Green	Green	Yellow	Green	Yellow	Yellow	Green	Green	Green
ESS	Mandatory Primary Frequency Response	Yellow	Green	Green	Green	Green	Yellow	Orange	Green	Green	Green	Green	Green
ESS	Fast Frequency Response	Yellow	Yellow	Yellow	Yellow	Green	Yellow	Green	Yellow	Green	Green	Green	Green
ESS	System Strength (Planning)	Grey								Green	Grey	Green	Grey
ESS	Structured procurement & Scheduling mechanisms	Green	Green	Green	Green	Green	Yellow	Green	Red	Red	Green	Green	Green

5. Next Steps

Proposed actions	Responsibility
AEMO follow-up feedback/actions arising from Workshop 1	AEMO
AEMO make any adjustments to pack format etc for Workshop 2	AEMO
Committee members reflect on “Committee Questions” as set out in the pack and engage with constituencies as required. Provide additional feedback to AEMO and Committee – by 23 December	Committee members
Committee members consider prioritisation, interdependencies, and sequencing of initiatives to leverage synergies and manage risks and cost in preparation for roadmap development workshops in February 2022.	All

See you next at...

Workshops

- Round 1 – Workshop 2: Mon 20 Dec 2021

Committee meetings

- Meeting 2: Mon 21 Feb 2022
- Meeting 3: Mon 21 Mar 2022

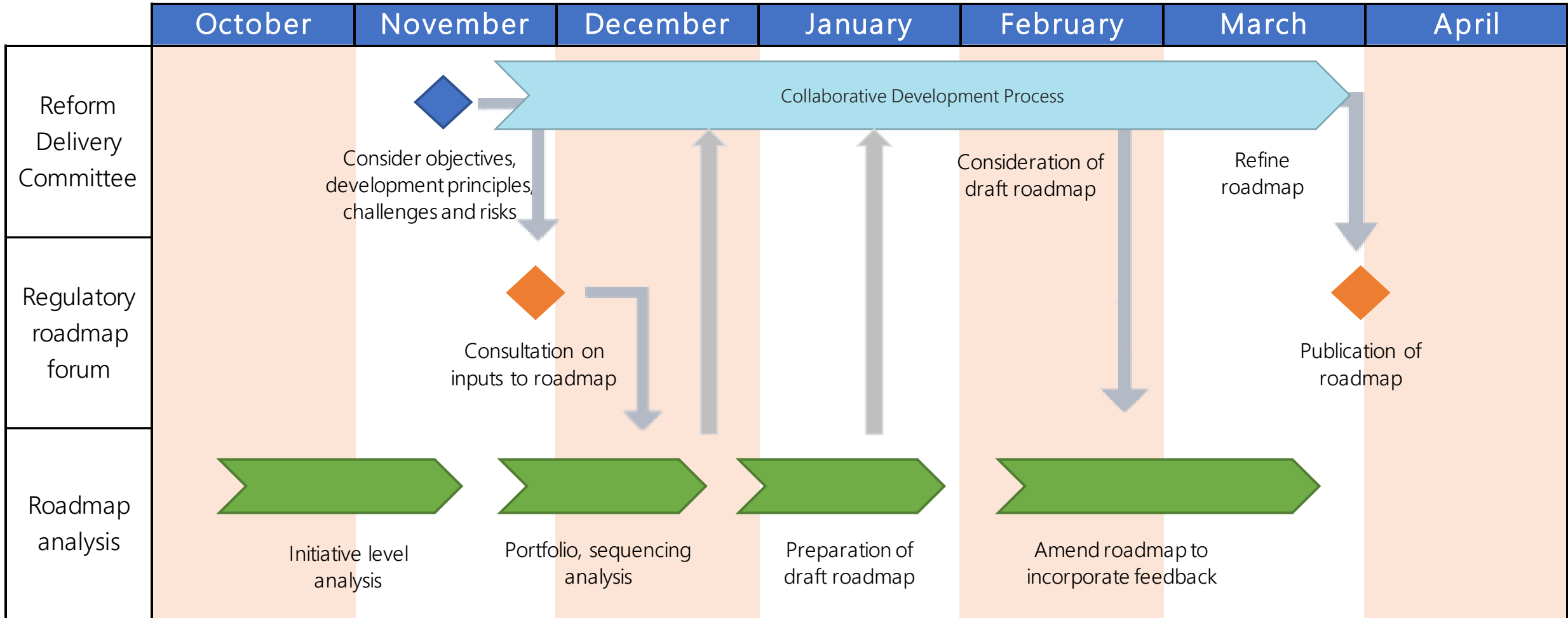
For more information
please visit www.aemo.com.au

Appendices

Workstream	Reform Initiative	Reference (link to rule change, market review, or latest ESB publication)
RAMS	MT PASA Enhancement	https://www.datocms-assets.com/32572/1629945809-post-2025-market-design-final-advice-to-energy-ministers-part-b.pdf
ESS	Fast Frequency Response	https://www.aemc.gov.au/rule-changes/fast-frequency-response-market-ancillary-service
	Mandatory Primary Frequency Response	https://www.aemc.gov.au/rule-changes/primary-frequency-response-incentive-arrangements
	Operating Reserve Market	https://www.aemc.gov.au/rule-changes/operating-reserve-market
	System Strength (Planning)	https://www.aemc.gov.au/rule-changes/efficient-management-system-strength-power-system
	Structured procurement & Scheduling Mechanism	https://www.aemc.gov.au/rule-changes/capacity-commitment-mechanism-system-security-and-reliability-services
	Unbundling system services (e.g. inertia)	N/A
	Integrated ahead market	N/A
T&A	Dedicated connection assets and system strength	https://www.aemc.gov.au/rule-changes/connection-dedicated-connection-assets https://www.aemc.gov.au/rule-changes/efficient-management-system-strength-power-system
	Interim REZ framework	https://www.datocms-assets.com/32572/1629945809-post-2025-market-design-final-advice-to-energy-ministers-part-b.pdf
	Transmission Access Reform	https://www.datocms-assets.com/32572/1637195419-transmission-access-reform-scope-of-work-and-forward-project-plan.pdf
	Transmission Planning & Investment Review	https://www.aemc.gov.au/market-reviews-advice/transmission-planning-and-investment-review
	Enhanced congestion information	https://aemo.com.au/consultations/current-and-closed-consultations/2021-congestion-information-resource-guidelines
	LMP & FTR	N/A

Appendix B

Roadmap timeline



Objective is to deliver the NEM2025 Implementation Roadmap by end-March.