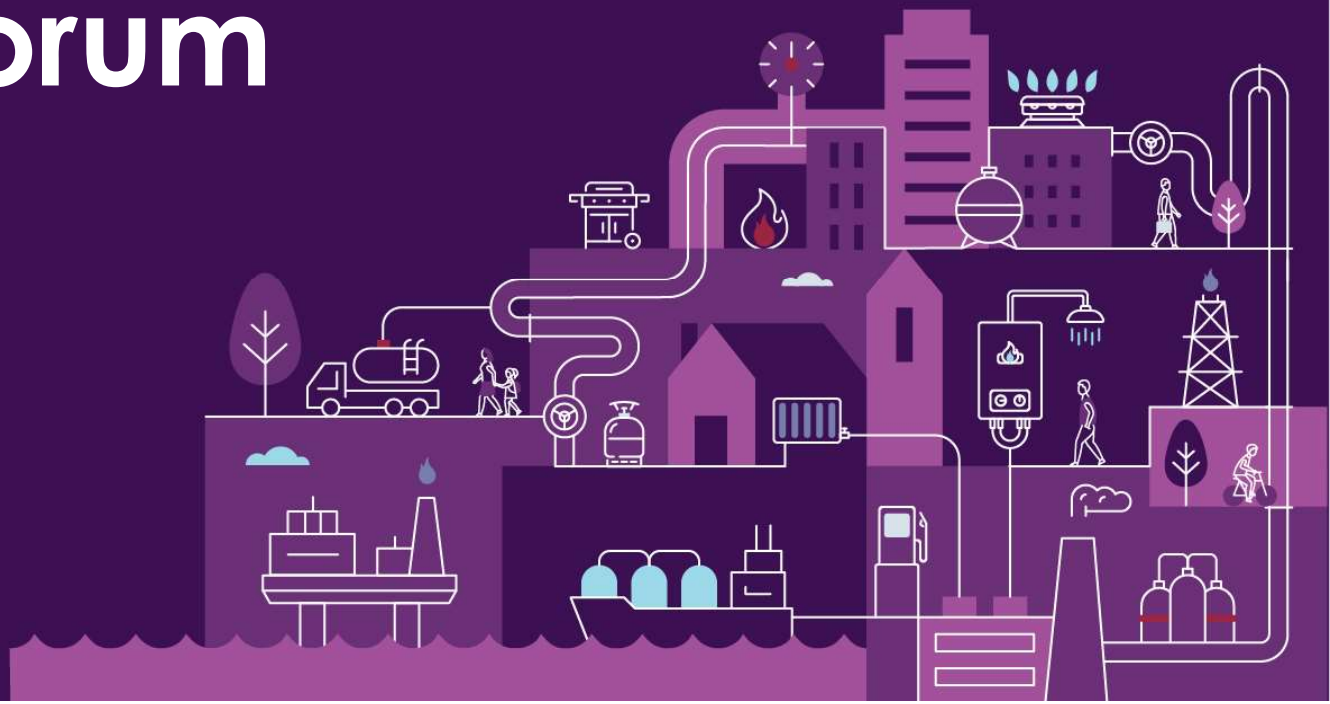
Consumer Forum

April 2022



Welcome & Acknowledgement of Country

Agenda

Time	Duration	Item	Speakers
9:00am	10 minutes	Welcome and introduction	Jane McNamara, GM Stakeholder Relations
9:10am	20 minutes	Financial Consultative Committee update	Paul Johnson, AEMO Stakeholder Relations Brian Murray, AEMO Finance Team
9:30am	40 minutes	NEM2025 Roadmap	Peter Carruthers, Business Advocate, Reform Delivery
10:10am	10 minutes	Victoria to New South Wales Interconnector – West (VNI West) Progress Update	Sandra Nielsen, AEMO Victorian Transmission Planning
10:20am	35 minutes	NEM Engineering Framework: update for consumers	Dave Reynolds, Stakeholder Relations Taru Veijalainen, Future Energy Systems
10:55am	5 minutes	Other business & close	Marteena McKenzie, AEMO Stakeholder Relations

AEMO Financial Consultation Committee

AEMO Financial Consultation Committee

- Established to improve the transparency and rigour of AEMO budget and fees processes by enabling early engagement from a representative group of stakeholders.

- The Financial Consultation Committee (FCC):
  - Annually reviews and provide comments on the draft AEMO budget.
  - Annually reviews AEMO's projected revenues, expenses, and major project horizon for the coming three-year period.
  - Provides feedback on AEMO's proposed Corporate Plan priorities.

- Set up in February 2021

AEMO Financial Consultation Committee

The members of the FCC were nominated by Industry Associations and include:

- Mr Jeff Forrest (Acting CFO, TransGrid).
- Mr Guy Mutasa (Energy Queensland).
- Mr Jonathan Spink (Director of Engineering and Projects, Pacific Hydro).
- Mr Ian Brooksbank (CFO, Hydro Tasmania).
- Mr Alastair McKeown (CFO, Energy Australia).
- Mr Michael O'Rourke (CEO, Stanwell).
- Ms Katrina Porteus (Director Strategy and Corporate, Energy Consumers Australia).
- Mr Raif Sarcich (Principal Policy Officer, Victorian Department of Environment, Land, Water and Planning).
- Mr Jonathan Wills (Manager National Coordination, NSW Department of Planning, Industry and Environment).

AEMO Financial Consultation Committee

- The FCC has advised on the 2021/22 and is currently advising on the 2022/23 AEMO Budget and Fees.

- Four meetings held so far on the 2022/23 AEMO Budget and Fees with the next meeting scheduled for late April 2022.

- For more information including minutes and presentations from previous FCC meetings, please visit AEMO website www.aemo.com.au and search “Financial Consultation Committee”.

AEMO Budget and Fees 2022/23 Update

- AEMO has under-recovered its costs and run sustained operational deficits for NEM core operations in recent years, accruing a deficit of ~$106m. This is not sustainable to continue.

- To reduce costs, AEMO has taken, and is continuing to implement actions to identify, quantify and reduce costs and drive effectiveness in operations.

- At the same time, AEMO needs to invest in core operations to ensure the safe, reliable and affordable energy system Australians expect.

AEMO Budget and Fees 2022/23 Update

- BCG consultancy has benchmarked AEMO against other system operators, finding:
  i. AEMO's core costs are low compared to peers, and
  ii. AEMO is underinvesting in some critical, central functions.

- In consultation with stakeholders, AEMO has produced a Corporate Plan to deliver on its obligations and priorities, noting the significant work required to ensure Australia has a capable system and market operator to help navigate a critical period in the Australian energy transition.

AEMO Budget and Fees 2022/23 Update

- The Corporate Plan drives AEMO's draft 2022/23 Budget, along with a set of principles appropriate to a non-profit entity. AEMO can not continue to operate with an annual deficit. Deficits accumulated also need to be recovered.

- Having engaged on these principles and issues with the FCC, AEMO is proposing to increase NEM Core fees for 2022/23 to:

  - Eliminate annual operating losses;
  - Recognise some costs have risen due to the increasing complexity in delivering core obligations; and
  - Commence recovery of accumulated losses form recent years.

NEM2025 Reforms and Implementation Roadmap

AEMO Consumer Forum Update

27 April 2022

Purpose

- AEMO's objective is to establish a collaborative process with stakeholders to define a roadmap for implementing the NEM2025 reforms – the "NEM2025 Implementation Roadmap"
- This roadmap can then be used by all stakeholders to assist in navigating the reforms over the coming few years, de-risk delivery and to inform regulatory implementation timings
- The Reform Delivery Committee (RDC) has been setup to help establish and guide the roadmap
  - The RDC held their first meeting 10 November 2021
  - Since then, monthly meetings have been conducted in addition to 4 deep-dive workshops
- The RDC is comprised of representatives from:
  - Market bodies – AEMC, AER, ESB
  - Industry participants representing – AEC, ENA and CEC
  - Consumer representatives – ECA, MEUA, EUAA and PIAC
- The purpose of this update is to provide an overview of the RDC and the NEM2025 Implementation Roadmap

Context

- The ESB provided its final advice on the Post-2025 reforms to the Energy National Cabinet Reform Committee on 27 July. National Cabinet approved the Post-2025 reform recommendations on 29 October
- One of the main enablers for the reforms is the development of IT systems and business processes
- An initial assessment of the impacts associated with the delivery of the reforms was prepared by AEMO and formed part of the ESB's final advice
- The ESB's final advice called for further consideration of how to deliver these changes together with industry stakeholders as part of an integrated roadmap approach for NEM regulatory and IT systems implementation
- The NEM2025 Implementation Roadmap will enable careful planning for the delivery of reforms, avoid unnecessary or duplicative costs, and identify where strategic investments can be made to deliver efficient outcomes for AEMO, market participants and consumers
- AEMO has identified initiatives that are required to be delivered ahead of the P2025 reform program to provide a functional or technological dependency (e.g. pre-requisites were identified across digital, registration, operational and dispatch streams)

The Roadmap – Objective & Principles

Objective

- The Objectives of the NEM 2025 Implementation Roadmap is 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

Principles

- In developing the roadmap, the following factors will be considered:
  - Reform benefits and priorities
  - Opportunities for bundling and sequencing initiatives to improve implementation efficiency
  - Industry pain points and strategic opportunities to improve operations. For example, e.g. lowering transaction costs, reducing barriers to entry and further achievement of the NEO
  - Implementation risks
  - Minimising duplicate processes
  - Allocation of implementation responsibilities taking account of efficiency, capability to deliver and management of implementation risks
  - Adaptability to respond to changes

The Roadmap – Scope & Benefits

Scope of NEM2025 Implementation Roadmap (Version 1)

Pathway	Reform Initiative
Resource Adequacy Mechanism	• Increased MT PASA Information
Essential System Services	• Fast Frequency Response • Mandatory Primary Frequency Response • Operating Reserve Market • System Strength (Planning)* • Operational Security Mechanism
Integration of DER & Flexible Demand	• Integrating Energy Storage • Flexible Trading Arrangements (Model 2) • Scheduled Lite • Dynamic Operating Envelopes • Distribution Local Network Services • Turn-up Services • DER Platform Registry Services • Market & System Operator Integration
Transmission & Access	N/A at this time
Data Strategy	• Data Services • EV Charging Standing Data Register • Bill Transparency • Network Transparency

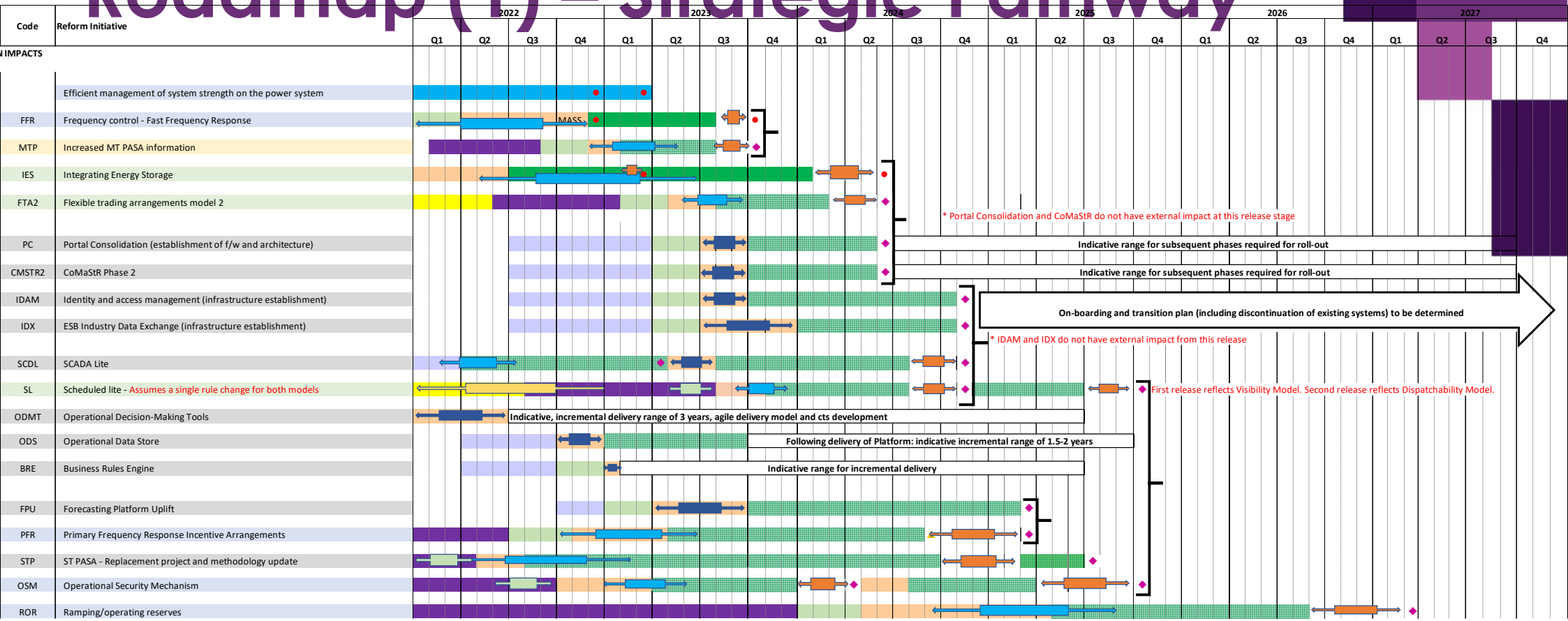
Note: Capacity Mechanism and Congestion Management Model are awaiting policy guidance before inclusion onto the Roadmap.

**Led by transmission network service providers*

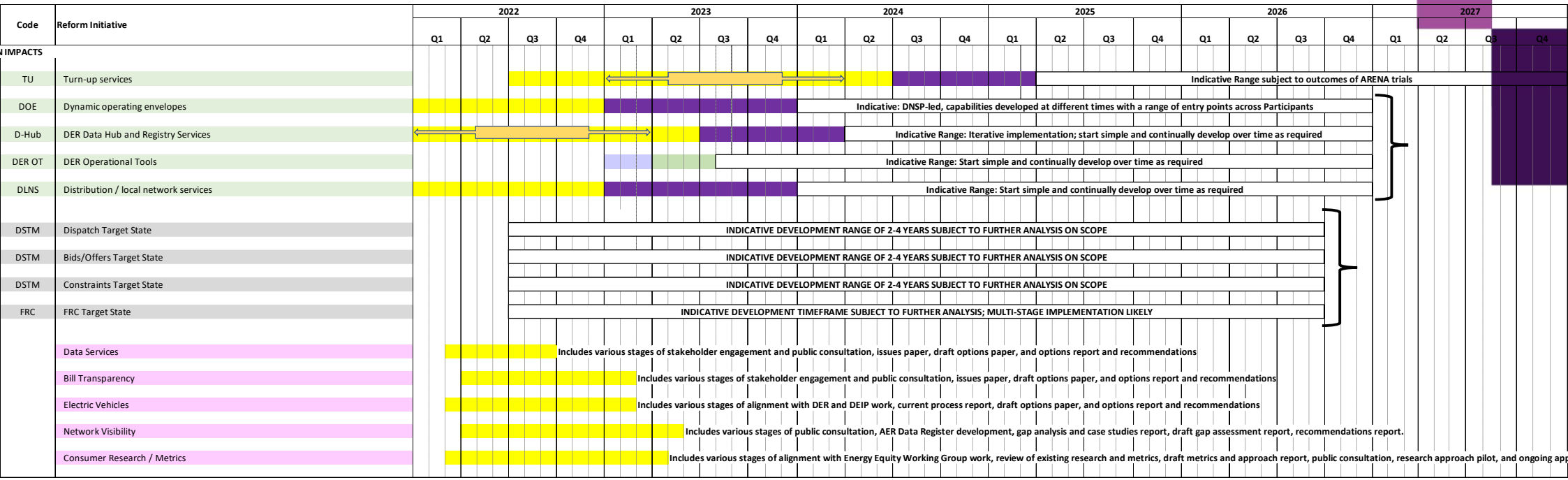
Why Is It Required?

- It's a very significant program, let's maximise the chances of industry-wide success and efficient delivery
  - Integrated program rather than piecemeal and fragmented
  - Drive down implementation costs
  - Supports implementation resource planning and mobilisation for all implementation stakeholders
- Transparency on implementation
- Informs implementation timing decisions by market bodies

Roadmap (1) – Strategic Pathway



Roadmap (2) – Strategic Pathway (ctd)



Pathways (1)

- We have developed two pathways with a distinct underlying approach

Regulatory Led Pathway

- It limits the scope to the bare minimum and does not consider coordination of regulatory and IT changes and therefore shared system impacts and minimising the number of system releases
- Strategic enabling technology solutions such as consolidating frameworks and platform uplifts to existing systems are deferred to commence after 2025, once most reforms have been delivered
- The reforms will be delivered by building on existing system frameworks and platforms, even those nearing the end of technical life. As these systems need to be replaced, new markets and processes implemented through the reforms will need to be migrated/integrated into future systems at a later point in time
- Most reforms are delivered by the end of 2025

The Regulatory Led roadmap delivers the reforms within the set or assumed regulatory effective dates by limiting the scope to the bare minimum

Strategic Pathway

- Shared system impacts are considered, the number of scheduled releases are reduced, and the foundational technology architecture and frameworks are established for future anticipated capability needs and removal of industry pain-points
- Reforms will be delivered into future state systems to the extent possible
- This pathway includes foundational target state technology development related to identity and access, and operational systems and tools. It also includes two large-scale and complex target state implementation initiatives relating to the uplift of the core Dispatch and Short-Term Market Operational (Dispatch, Bids/Offers, Constraints) platforms, and the consolidation of the Retail Markets (all fuels) technology and process framework.
- The delivery date for some reforms may extend beyond the assumed regulatory deadline. The roadmap limits the number of these instances and the length of a proposed extension will be subject to as yet undefined rule change effective dates.

The Strategic roadmap balances implementing reforms within regulatory timeframes where possible and optimising the reform delivery program

Neither roadmap is yet fully integrated with AEMO's enterprise-wide program of work and constraints

Pathways (2)

- The pathways require consideration of various trade-offs affecting overall program efficiency

Future reforms such as a Capacity Mechanism or Congestion Management Model will require a reconsideration of the pathways and trade-offs within the Roadmap

Trade-off	Description
Program Optimisation	• Coordination of regulatory and IT change in a timely and efficient manner, and consideration of shared system impacts to bundle reforms to minimise the number of system releases • *Example: Collectively adopted pathways provide for optimal grouping, sequencing and prioritisation of AEMO, participant and NEM 2025 initiatives*
Regulatory Timelines	• Capacity to meet regulatory timeframes • *Example: A strategic / foundational pathway would necessitate delay to the implementation of reform initiative in order to establish new foundational systems / processes*
Overall Cost Efficiency	• Implements reforms in a timely and efficient manner and at least whole-of-system cost • *Example: A short term focus may require building upon legacy systems that are nearing their end-of-life and need to be replaced. This may still require transition to a target state at a later date adding costs*
Risks	• Minimises overall implementation risks • *Example: Delay of an individual initiatives over time may create different delivery risks in the future such as the challenges of managing a larger bundle of reforms including resourcing and variations in scope*
Scalability	• Flexibility to adapt to future changes • *Example: The extent to which a pathway delivers target state reforms / initiatives with capabilities beyond those required for 'Day 1'*
Participant Investment and Operations	• Considers impact on participant investments (timing and scale) required for each delivery pathway as well as impacts on participants day-to-day operations and administration • *Example: A regulatory led pathway would maintain existing systems (and pain points) but would require further participant investment to transition to strategic systems over time.*

Immediate Next Steps

- **NEM2025 Implementation Roadmap**
  - Publication 22 April
  - Target 4 week period for feedback – due 20 May
  - Stakeholder forum 11 May

- **Participant Impact Assessment sought**
  - From RDC members

- **Decision on Roadmap Pathways and Release of Roadmap V2**
  - Business case process for Pathways
  - Stakeholder feedback on Pathways
  - RDC collaboration and input
  - AEMO input based on current architecture reviews underway

VNI West Update

Sandra Nielsen

Agenda

1. Overview
2. RIT-T update
3. Upcoming engagement activities
4. Next steps
5. Contact details

Victoria to New South Wales Interconnector West (VNI West) Update

- Proposed new transmission interconnector between Victoria and NSW
- A key project to enable the low carbon energy transition
  - unlocking clean, low-cost electricity from renewable energy zones in both states, reducing carbon emissions and helping to fill the gap as coal-fired power stations close
  - significantly boost the ability to share energy, improving security of supply
- VNI West via Kerang is a staged actionable ISP project
  - Stage 1 – early works
  - Stage 2 – implementation subject to decision rule and feedback loop
- Joint Transgrid and AEMO Regulatory Investment Test for Transmission (RIT-T)

RIT-T: 3-step regulatory process – current status

1. Project Specification Consultation Report – published Dec 2019
2. Project Assessment Draft Report – ***to be published soon***
   - At this stage publication planned for late June or in July
   - Followed by a six-week consultation period
     - Online forums
     - Written submissions welcomed and valued – published online
     - Feedback to be considered in the preparation of the final RIT-T report
3. Project Assessment Conclusion Report – *to be published by early 2023*

RIT-T under Actionable ISP Framework

- The ISP assessed a wide range of corridor locations for VNI West
- The option of 'VNI West via Kerang' was identified as the most beneficial and an Actionable ISP Project
- The VNI West RIT-T assessment will now focus on:
  - VNI West via Kerang and credible non-network options
  - 3 scenarios specified in the ISP
    - Progressive Change, Step Change and Hydrogen Superpower

- The Australian Energy Regulator's ***Cost benefit analysis: Guidelines to make the Integrated System Plan actionable*** applies

Broader engagement activities

- Briefings and roundtables with community representatives such as local Councils and agricultural organisations
- Project Updates: #3 available soon; #4 at PADR release
- Newspaper advertisements, social media, etc
- Contact us at
  - VNIWestRITT@aemo.com.au
  - 1800 845 044
  - Visit VNI West project webpage

NEM Engineering Framework

Proposed near-term priority actions

Agenda

Today we will:

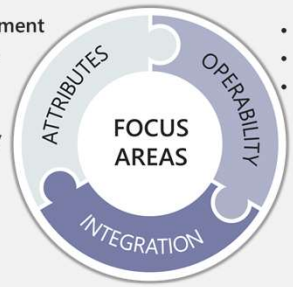
- Provide an overview of the Engineering Framework scope and work-to-date
- Provide an update on the development of a shortlist of near-term priority actions from the Engineering Framework
- Highlight a small subset of these actions relevant to stakeholders

AEMO's Engineering Framework

The Engineering Framework takes a holistic view of the changing characteristics of our energy system to help ensure the operability of the NEM over the next 10 years.

Current knowledge and work (March 2021)

- Frequency Management
- System Restoration
- System Strength
- Voltage Control
- Resource Adequacy



- System Analysis
- Control Room and Support
- Resilience

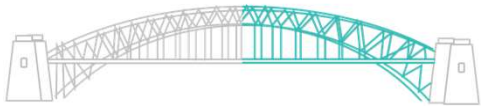
- Distributed Energy Resources
- Performance Standards

Potential Gaps and Actions (December 2021)

Operational Conditions Summary (July 2021)

1	Fewer synchronous generators online
2	Ubiquitous rooftop solar
3	Extensive grid-scale VRE
4	Structural demand shifts
5	Responsive demand
6	Widespread energy storage

Recent history of the Engineering Framework



Gap identification

December 2021

- Worked with stakeholders to build a list of over 300 gaps requiring action over the next five to ten years of the energy transition.
- Published findings in Initial Roadmap report.

Stakeholder Forum

February 2022

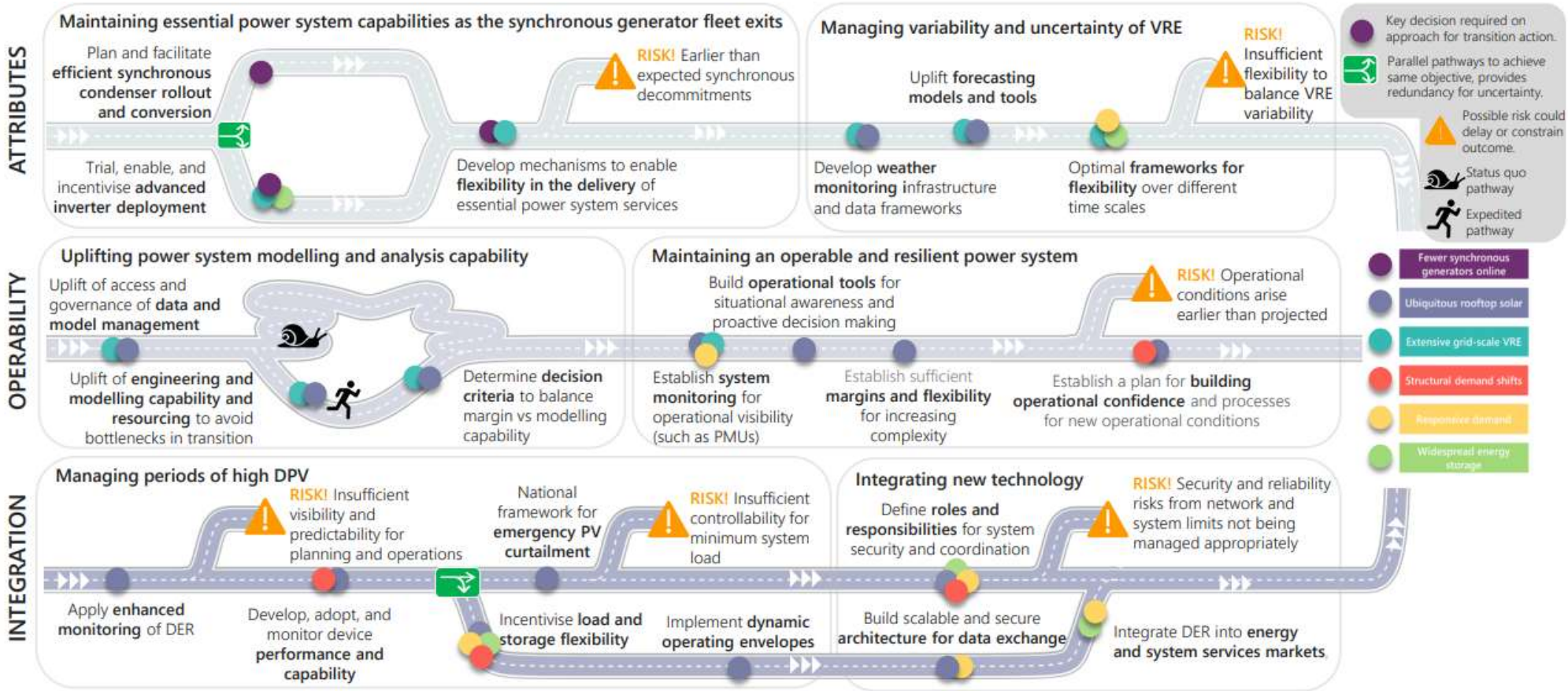
- Discussed the need to strike a balance between detailed planning and timely action. Determined that AEMO would prepare an initial shortlist of proposed actions for the next 1-2 years, for further refinement through industry collaboration.
- Determined that AEMO could use an agreed set of prioritisation principles to guide the identification of priority actions from the full list of gaps.

Convert potential gaps to early actions

March 2022

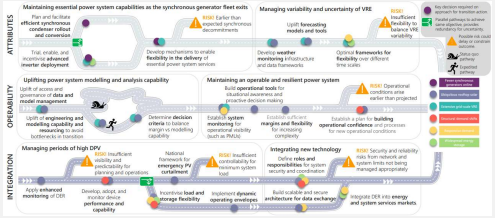
- AEMO developed a shortlist of ~40 potential actions, noting:
  - The shortlist does not provide full coverage of all gaps. Future Engineering Framework roadmaps will increase this level of coverage.
  - Some actions could be incorporated into existing workplans, while others require further discussion on responsibilities and implementation.

Next steps for decision making roadmap



AEMO's shortlist development process

Develop initial actions from key decisions roadmap



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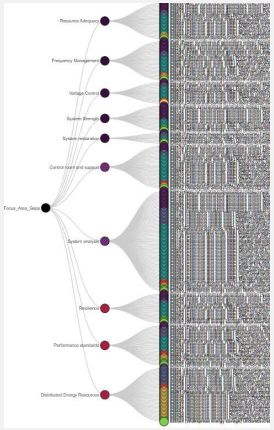
Review full gaps list to identify additional urgent actions



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Review across AEMO teams to refine actions

Initial shortlist of priority actions developed

Action ID number	Proposed action	Potential implementation pathway
A-2	Undertake a program of power system studies to assess power system stability in the NEM at times of 100% renewable generation and assess future system requirements with fewer large synchronous generators	New AEMO initiative, efforts to be aligned with TNSPs and other related industry initiatives
A-3	Develop new Operational Forecasting approaches to quantify and take into account uncertainty in demand, VRE and supply availability	Proposed new AEMO initiative
A-4	Deploy new weather monitoring infrastructure to support REZs	Collaboration with BOM, other weather providers, and jurisdictions
A-12	Establish appropriate over-frequency management settings in all NEM regions	AEMO to undertake initial studies under PSFRR/GPSRR TNSP responsibility to resolve
A-16	Establish widespread PMU coverage and high-speed data ingestion/automation processes	Targeted AEMO interaction with NSPs and market bodies to support case. TNSP including cost-benefit analyses in regulatory proposals AEMO Operations Technology Roadmap for development of control room tools.
A-32	Establish a voluntary specification for grid-forming inverters	AEMO to work with domestic and international industry stakeholders to establish appropriate pathway

Prioritisation principles

Engineering Framework timeline

The Engineering Framework is an iterative process, and will include ongoing industry engagement, progressive commencement of actions, monitoring of progress and ongoing updates

Q2 2022

Q3 2022

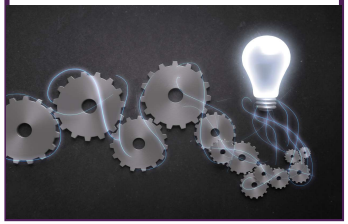
Q4 2022

AEMO and industry collaborate to define near-term priority actions

Engineering Framework mid-year update on near-term actions

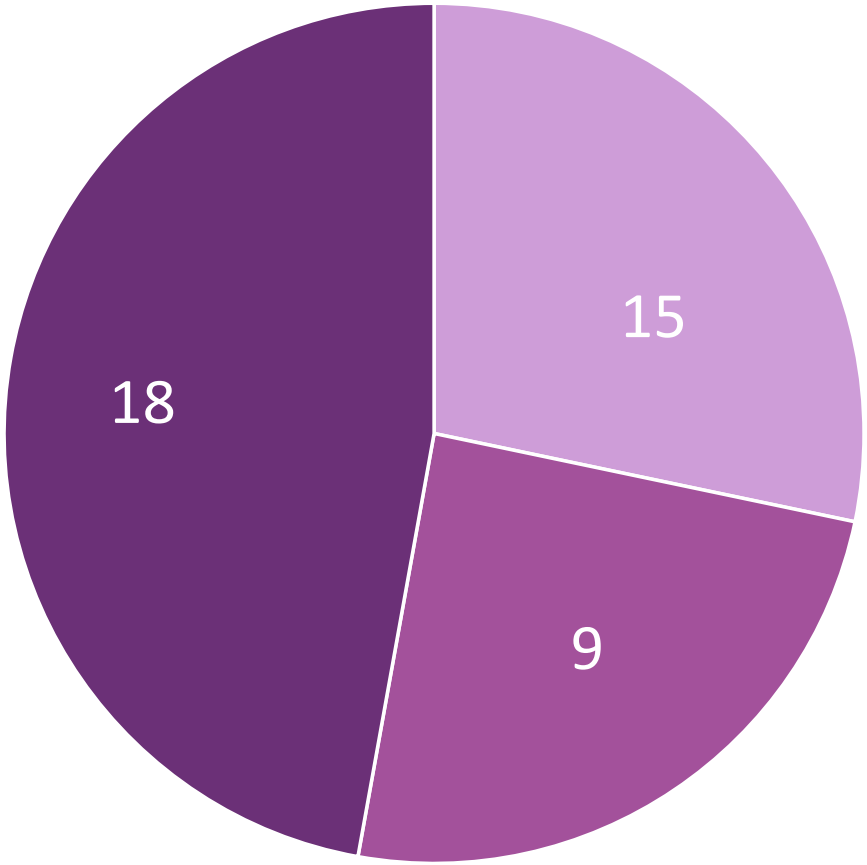
AEMO to develop and consult on an updated Engineering Framework roadmap

Engineering Framework end of year update



AEMO and industry to begin work on priority actions

Action ownership and responsibilities



Existing initiative
Actions that align well with existing initiatives

AEMO coordination needed
Proposed actions where AEMO would need to establish new workplans to coordinate delivery, collaborating with industry throughout.

Industry coordination needed
Proposed actions where responsibilities may lie across multiple organisations, with further work needed to identify delivery mechanisms and ownership.

Relevant actions

Action ID number	Proposed action	Potential implementation pathway	Action category
A-5	Establish effective DPV emergency backstop mechanisms before minimum system load challenges emerge	Continue with state-by-state discussions, in parallel advocate for national framework through ESB DER implementation workplan	Industry coordination needed
A-15	Establish clear roles and responsibilities across the energy sector for remote interactions with DER devices	ESB cyber security stream and DEIP	Industry coordination needed
A-19	Align consumer incentives with power system needs and scarcities	ESB DER Implementationplan	Industry coordination needed
A-20	Establish satisfactory DER performance standards compliance arrangements	Escalate with market bodies, jurisdictions	Industry coordination needed
A-40	Uplift engineering resources and skills in Australia to support increasing demand for power system engineering expertise.	Engineers Australia CRI?	Industry coordination needed
A-50	Trial sub-sections/regions of the NEM at 100% IBR operation	Will require collaboration across multiple parties	AEMO Coordination needed

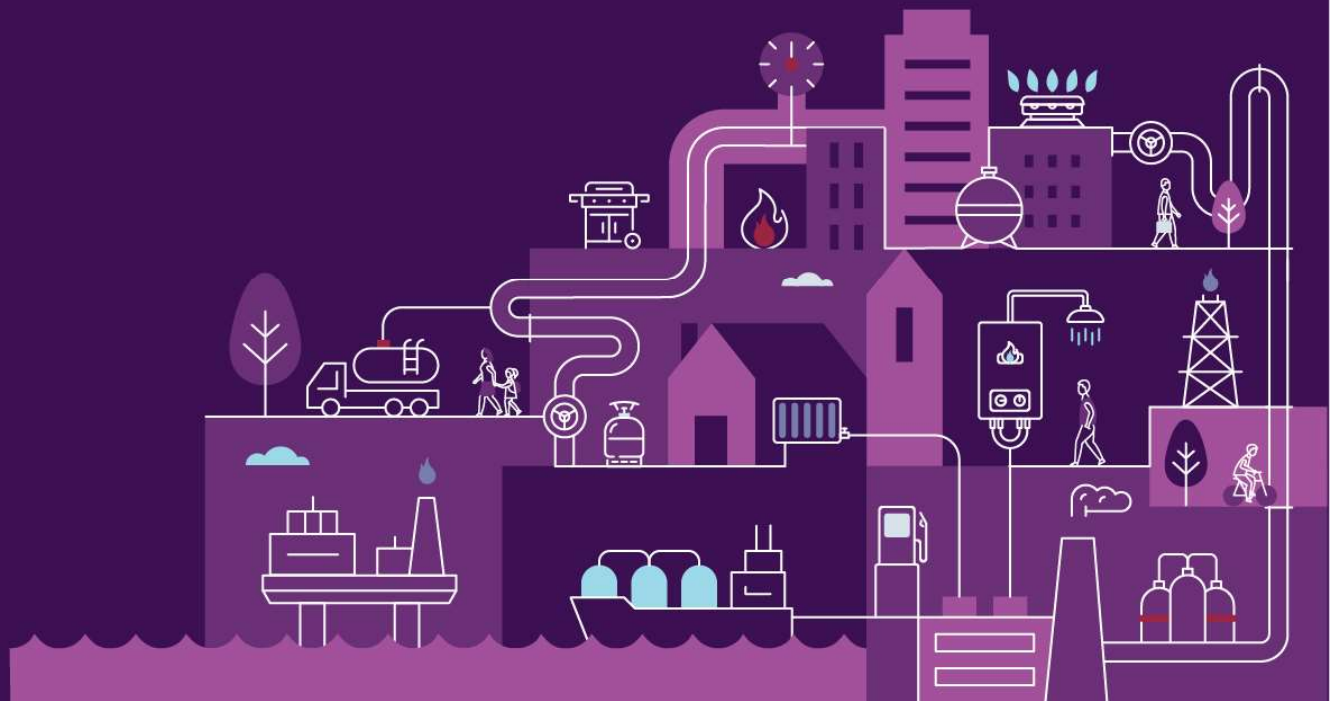
Next Steps

- Intend to publish an update in May on near-term priority actions
- Throughout 2022, develop and consult on an updated Engineering Framework long-term roadmap.

If you would like to provide feedback:

- Please reach out to AEMO at FutureEnergy@aemo.com.au

Other business & close



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