



DER Market Integration Consultative Forum

16 September 2021

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

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

AEMO Competition Law Meeting Protocol

AEMO is committed to complying with all applicable laws, including the Competition and Consumer Act 2010 (CCA). In any dealings with AEMO regarding proposed reforms or other initiatives, all participants agree to adhere to the CCA at all times and to comply with this Protocol. Participants must arrange for their representatives to be briefed on competition law risks and obligations.

Participants in AEMO discussions **must**:

1. Ensure that discussions are limited to the matters contemplated by the agenda for the discussion
2. Make independent and unilateral decisions about their commercial positions and approach in relation to the matters under discussion with AEMO
3. Immediately and clearly raise an objection with AEMO or the Chair of the meeting if a matter is discussed that the participant is concerned may give rise to competition law risks or a breach of this Protocol

Participants in AEMO meetings **must not** discuss or agree on the following topics:

1. Which customers they will supply or market to
2. The price or other terms at which Participants will supply
3. Bids or tenders, including the nature of a bid that a Participant intends to make or whether the Participant will participate in the bid
4. Which suppliers Participants will acquire from (or the price or other terms on which they acquire goods or services)
5. Refusing to supply a person or company access to any products, services or inputs they require

Under no circumstances must Participants share Competitively Sensitive Information. Competitively Sensitive Information means confidential information relating to a Participant which if disclosed to a competitor could affect its current or future commercial strategies, such as pricing information, customer terms and conditions, supply terms and conditions, sales, marketing or procurement strategies, product development, margins, costs, capacity or production planning.

Today's meeting

Time	Item	Speaker
11:00 – 11:05	Welcome and introductions	Matthew Armitage
11:05 – 11:10	Virtual Power Plant Demonstrations Update	Matthew Armitage
11:10 – 11:40	ESB – DER Implementation Plan Overview	Phil Blythe & Mitch O'Neill (ESB)
11:40 – 11:50	Scheduled Lite rule change proposal	Trent Morrow
11:50 – 12:15	Engineering Framework – Operating conditions	Rama Ganguli
12:15 – 12:25	Q&A	<i>Via Slido.com – use code #MICF</i>
12:25 – 12:30	Future Meetings & Close	Matthew Armitage



VPP Demo & MASS Consultation update

VPP Demonstrations Knowledge Sharing

The fourth and final VPP Demonstrations Knowledge Sharing Report has been published on AEMO's [VPP Demonstrations webpage](#).

The final VPP Demonstrations Consumer Insights report is also now available at the same link.

There will be a public webinar on the VPP Demos insights on 28 September.

MASS Consultation Overview

 We are here

First Stage Consultation Commences	First Stage Submissions Close	Draft Report Published & Second Stage Consultation Commences	Second Stage Submissions Close	Final Report Published & Consultation Concludes
Tuesday, 19 January 2021	Thursday 11 March 2021 <small>2 week extension added</small>	Monday, 14 June 2021 <small>9 week extension added</small>	Friday, 6 August 2021 <small>1 month extension added</small>	TBC <small>Indicative</small>
Start	37 Business Days	65 Business Days	39 Business Days	30 Business Days

- Due to the volume and detail of the submissions received during the second stage of consultation, AEMO have required more time than scheduled to consider each in detail. As a result, we are unlikely to have the Final Determination ready for publication on the 17th September.
- A formal communication will be provided by 17th September on the updated timeframes to finalise the MASS consultation.
- Please contact MASS.consultation@aemo.com.au for any questions.



ESB DER Implementation Roadmap

Phil Blythe & Mitch O'Neill

Energy Security Board

Post 2025 Market Design Program

Final Recommendations
Integrating DER and Flexible Demand

SEPTEMBER 2021





- ESB delivered final recommendations to Ministers in late July
 - Decisions to follow in due course
 - Public release of advice enables discussions on issues raised and proposed way forward
- Post-2025 recommendations cover three time-frames:
 - Immediate – do now
 - Initial – need to be developed now for implementation in medium term
 - Long term –the need for further reforms will be assessed over time



RECOMMENDATIONS 7, 8 & 9: IMMEDIATE REFORMS

Delivery of DER Implementation Plan

Ministers to agree:

- Support for plan and sequenced delivery of regulatory, market and technical reforms to address emerging risks

Next steps:

- Technical/cyber standards & guidelines
- Maturity Plan approach to inform activities with priority consumer needs and insights
- Development of two-sided market reforms underway in rule changes
- DER technical standards governance rule change process starts 5 August

Adopt emergency backstop measures

Ministers to agree:

- To adopt emergency backstop measures to address emerging system security challenges associated with minimum system load conditions (to be implemented by individual jurisdictions)

Next steps: (parallel activities underway)

- Roll out of Dynamic Operating Envelopes
- Enhanced information provision – e.g., Lack of Demand market notices
- Trials for enhancing ‘turn up’ capabilities
- States to consider policy ‘nudges’ to align support schemes with the needs of the market and system

Consumer risk assessment tool

Ministers to note:

- risk assessment tool now in place and to be used by market bodies in carrying out their activities

Next steps:

- market bodies will use tool to ensure consumer protections to remain fit for purpose

THE ESB RECOMMENDS IMPLEMENTATION OF DATA STRATEGY TO ENABLE IMPROVED CONSUMER OUTCOMES

Ministers to agree:

- Implementing of strategy including introduction of new high level policy principles to govern management and use of data
- Regular reporting and advice about forward priorities, changing data needs and risks in the context of the NEM

Next steps

- Focus on priority data gaps – proposed areas include: EVs, Network Transparency, Consumer Research, Consumer bill transparency



- Advice sets out directions for how roles and responsibilities of various actors across the energy ecosystem will need to evolve to enable the effective integration of DER. These directions have been built into reform activities.

- **Customers**

- Facilitating the energy needs of the customer is the fundamental role of the energy system

- **Traders (Retailers and Aggregators)**

- Traders provide the operational and financial connection between the customer and the market

- **Distribution Network Service Providers**

- DNSP provides the physical connection of the customer to the system and market, management of capacity and operation of distribution network

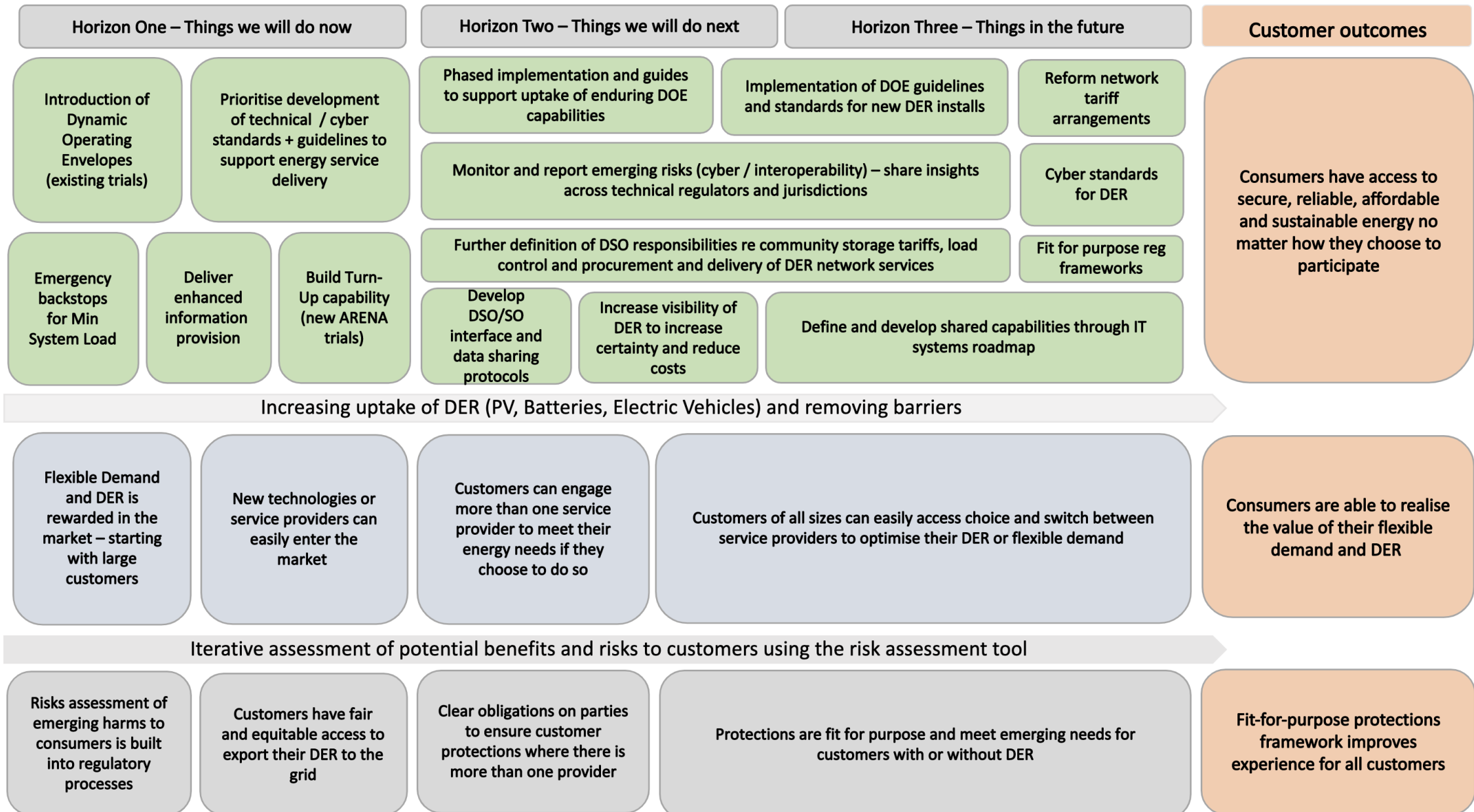
- **System and Market Operator (AEMO)**

- Operation of the system and market, management of system security and reliability (keeping the lights on), ensuring the supply and demand balance

- **Data and Technology**

- In a high-DER, decentralised system with millions of actors and devices, digitalisation is a necessary capability

DER IMPLEMENTATION PLAN – SUMMARY VIEW

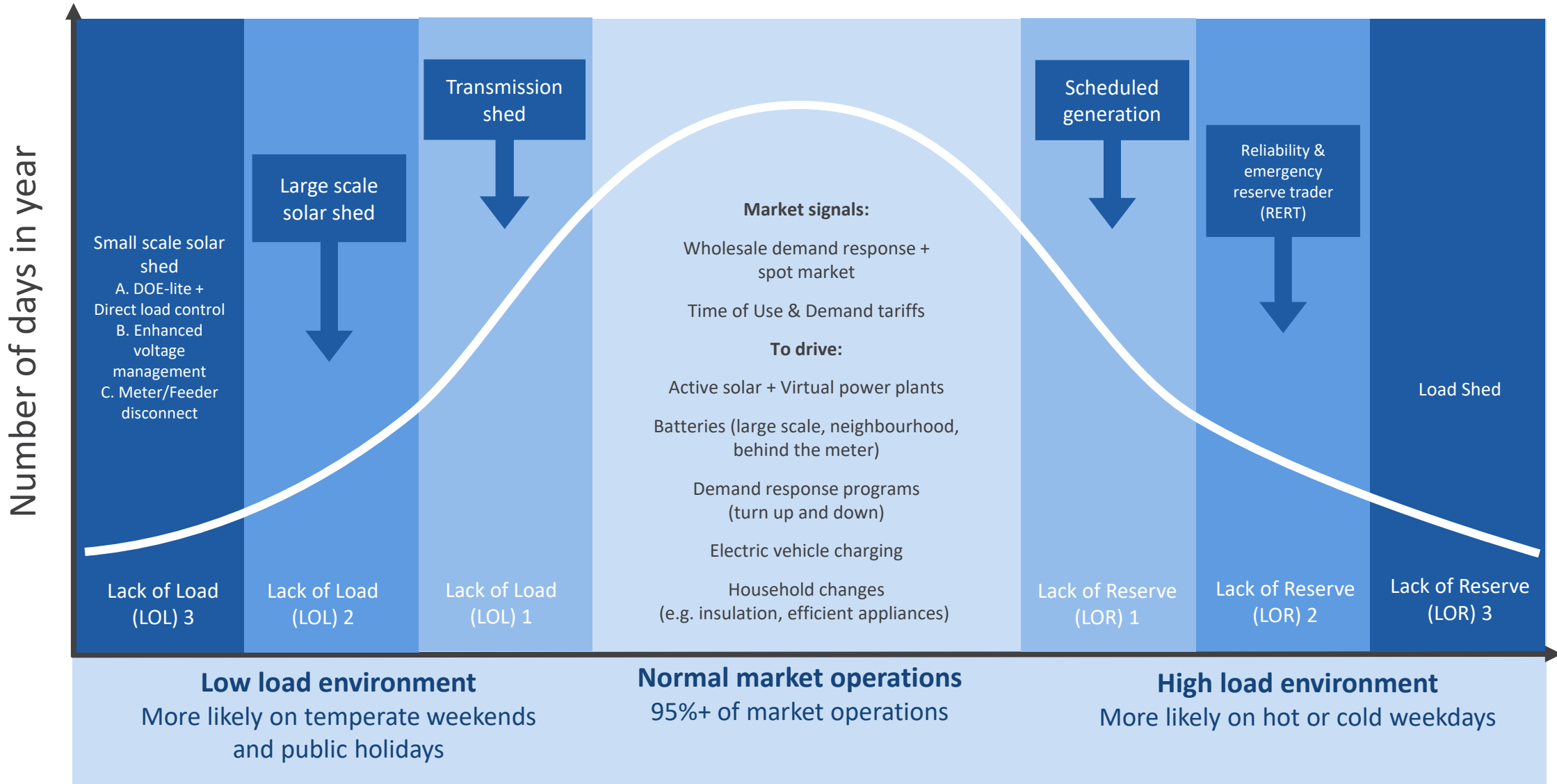




- Issues associated with low system load are creating a growing challenge for maintaining system security the NEM, with the recent increase in distributed solar installations relative to forecasts causing problems to emerge quicker than previously expected
- More work is needed by AEMO on characterising how the system security problems and consequences associated with minimum system load emerge in each region to better inform when and what solutions are implemented and how they are used. These insights need to be communicated with stakeholders to build greater understanding of these factors
- Emergency measures will likely be required in all mainland NEM jurisdictions in the coming years, with more immediacy required for Queensland, followed by Victoria.
- Emergency measures are buying time and enhancing capability in preparation for more enduring solutions such as dynamic operating envelopes and two sided market reforms. As such, many of the pieces of work in the DER Implementation Plan such as standards and technical regulation, cyber-security, roles and responsibilities will both inform the implementation and operation of some backstop measures, and need to be completed in a timely manner where measures are being used for short-term purposes



Structuring and formalising existing arrangements





Measures include:

- Ministers to consider putting in place levers to **enable emergency backstop measures** across jurisdictions – building on insights emerging from SA experience and stakeholder feedback to enhance implementation outcomes in other states
- AEMO to develop **enhanced information provisions and a formal “minimum system load” framework** both to support the timing and implementation of emergency backstop measures, as well as support market development of increased “turn up” load
- **Market development and trials of “turn up” solutions** should be pursued to increase the capability and capacity of load to respond to low or negative price signals during times of abundant VRE, which is correlated to periods of minimum demand
- Ministers to consider **designing new features into existing subsidies** in order to encourage enhanced consumer and system outcomes in the operation of DER assets

CUSTOMER RISK ASSESSMENT TOOL



Context The market bodies will use this tool to consider consumer risks and benefits in policy development, including rule change requests (as part of considering the National Energy Retail Objective), reviews of guidelines and processes that would impact consumers. It will also be used through the maturity plan releases.	
Communicate and Consult	Benefits Assessment This part of the tool includes a series of questions to assess benefits of the change, or new product/service to customers. It also requires mapping of how it achieves the following consumer protection principles: <ul style="list-style-type: none"> • Access to energy: Recognising that energy is an essential service, customers should have access to at least one source of electricity • Switching providers: Customers should be able to change retail providers when they choose • Access to information: Customers should have access to information that is sufficient, accurate, timely, and minimises complexity and confusion to allow them to make informed decisions • Vulnerable consumers: The needs and circumstances of vulnerable consumers will need to be explicitly considered • Dispute resolution: Customers should have easy access to no cost dispute resolution mechanisms when things go wrong.
	Identify Risks This stage includes a series of questions to identify barriers to achieving benefits and/or risks to customers. It requires consideration of the multiple aspects of the consumer experience, situations, and the diverse range of customers
	Evaluate This stage includes two parts. <ol style="list-style-type: none"> 1. Evaluate the magnitude of the risk or issue (including whether it is a significant risk of harm or an inconvenience) and rank the risks and issues based on severity of consequences and the likelihood of it occurring 2. Evaluate the extent to which the market bodies can address the risk or issue: Can they act? / Can they influence? / Should they monitor?
	Treat risks This section includes a series of questions for assessing the options to address the risks or to remove barriers. It also seeks to clarify who is responsible for progressing the risk mitigation? How will it be done and by when?
Monitor and review	

- Consumer risk assessment tool developed as part of the Post-2025 reforms - will be used as a tool by all market bodies.
- The purpose of the tool is to explicitly consider consumer benefits, barriers to benefits and risks as part of the design and development of market reforms and as part of reviews of processes (such as the retailer authorisation process) that would affect consumers.
- Incorporates “consumer protection principles” - developed with stakeholders and customer advocates through the Post-2025 process.
- Stakeholders commented favourably on the draft tool that was included in the April Options paper. Updates made to reflect stakeholder suggestions for improvement.

MATURITY PLAN



- The Maturity Plan describes a collaborative approach proposed to generate and test customer insights on a series of key issues.
- The Maturity Plan is intended to enable and enrich stakeholder buy-in; supporting market bodies and others delivering DER related reforms as part of the DER Implementation Plan.
 - DEIP program demonstrates the value of iterative, customer-focussed co-design process
 - The intention of the Maturity Plan is to build this kind of capability into ongoing development of DER related reforms
- The Maturity Plan also provides a flexible and collaborative mechanism to adapt priorities / sequencing of reforms across the DER Implementation Plan as we learn what works and the market evolves.
- The scope has been re-focussed over the course of Post-2025 program reflecting stakeholder feedback and the lessons from the Maturity Plan pilot. The intent is to draw on the best work already being done across the sector and enrich not duplicate the rule change and other processes like DEIP.

HOW DO WE SEE THE MATURITY PLAN OPERATING IN PRACTICE? DIVERSE CUSTOMER AND STAKEHOLDER INPUT WILL BE KEY



- **Stakeholder Steering Cohort**

- Designed to support alignment with the broad churches of stakeholder perspectives, the SSC brings together 6 diverse representatives from across the sector to meet the common challenge.
- Will play a substantial role in driving the work on each release ... *define the problem, and set objectives and principles*, which they can own and become champions for propositions through the rule change process etc.
- Engaged via an open EOI which will select for diversity of expertise and understanding.
- SSC renewed for each release.
- Funding for customer representative (and other reps if needs demonstrated).

- **Technical Design Squad**

- Intended to bring together technical input to test and shape emerging solutions from each release from a technical perspective – highlighting risks, opportunities, issues to support practical implementation.
- Different membership to the SSC but can also change for each release based on needs / interest. Feed insights into design workshops



- The DER Implementation Plan sets out the priorities and sequencing for reforms across the sector.
- The customer insights will be framed on specific market and service issues for each Maturity Plan release. This should also build up an increasingly sophisticated consumer picture over time consistent with the trajectory of the DER Implementation Plan.
 - **2021-2022**
 - MP1 - *how to remove barriers for customer to be rewarded for flexible demand* (use cases - C&I turn up loads, in-home devices such as smart hot water systems, air conditioning loads and pool pumps)?
 - MP2 - *how do customers give and receive signals to the market* (use cases - smart appliances and process automation)?
 - **2022-2023**
 - MP3 - *how do customers want to use smart charging* (use cases: smart charging infrastructure away from primary premises and EV smart home charging)?
 - MP4 - *how do customers choose and switch providers* (use cases - enrolment in VPPs and upgrading existing systems)?
 - **2023-2024**
 - MP5 / MP6 - *priorities to be informed by earlier releases as well as customer and stakeholder input.*



How to remove barriers for customers to be rewarded for flexible demand

Realising the \$10-15bn* in long term market benefits from DER hinges on customer participation. There is little participation of flexible demand in the wholesale energy market today, particularly at the smaller end (e.g., hot water)

Enabling this value to be unlocked will require:

- A deeper understanding of customer behaviour and needs under a range of different conditions
- A suite of market, technical and regulatory arrangements that work together to provide the right mix of incentives and policy settings to reward customers who choose to offer their flexible demand / assets to service providers
- Simple and easy to understand products and services with fit for purpose customer protections
- Addressing challenges facing customers or service providers to enter the market and offer new flexibility products / services

Multi faceted challenge which will require multiple solutions that can work together in harmony:

- *Customer issues include* – need for arrangements to be easy to understand, simple and safe to switch and make new choices, protections that reflect the level of risk customers are prepared to take (e.g., safe default settings), customers being adequately rewarded for the flexibility that they may choose to provide to the system (in ways they wish to be rewarded), arrangements will need to work for all customers (not just those with DER assets)
- *Technical issues include* – need to ensure system remains secure under changing demand profiles, need customer assets / DER devices to ‘talk to each other’ and integrate with network and market systems with ease of use, need visibility to support network and system operators to maintain and operate the grid system
- *Regulatory / market issues include* – need for a mix of regulatory and market arrangements that work together to make it easy for new entrants to enter the market and offer flexibility products and services to customers, and that provide signals for efficient outcomes via services to help balance the system to shift load or turn off exports at key times of the day

* ESB commissioned studies by Baringa and NERA on market and network savings from effective DER participation



How do customers want to give and receive signals from the market?

There are more signals than ever before going to customers – retail TOU tariffs, market TOU tariffs, feed-in tariffs, export tariffs, dynamic connection limits, direct load control tariffs, demand response payments, multiple service providers,? Is it too much for customers to manage?

The risks of implementing a set reforms that result in a poor experience will mean non-compliance, fewer protections, poor customer outcomes, and ineffective reforms.

How do we better understand the growing complexity issue for customers, the risks that it imposes, and what types of experiences (and hence services) the market arrangements encourage.

How do the Post-2025 reforms collectively manifest for customers? What decisions can the market bodies or policy makers take that will mitigate / offset the increased complexity for customers?

- Are there new risks that we are introducing with the new reforms, either as single reforms, or collectively?
- What can we do to ensure the combined impact for customers is a better experience?
- How do we facilitate better, simpler products and services?
- Trust and social license are key factors influencing the customer experience – important that the mix of arrangements in place do not lead to unintended consequences



Scheduled Lite Proposal

Trent Morrow

Scheduled Lite Initiative

ESB has proposed the concept of Scheduled Lite

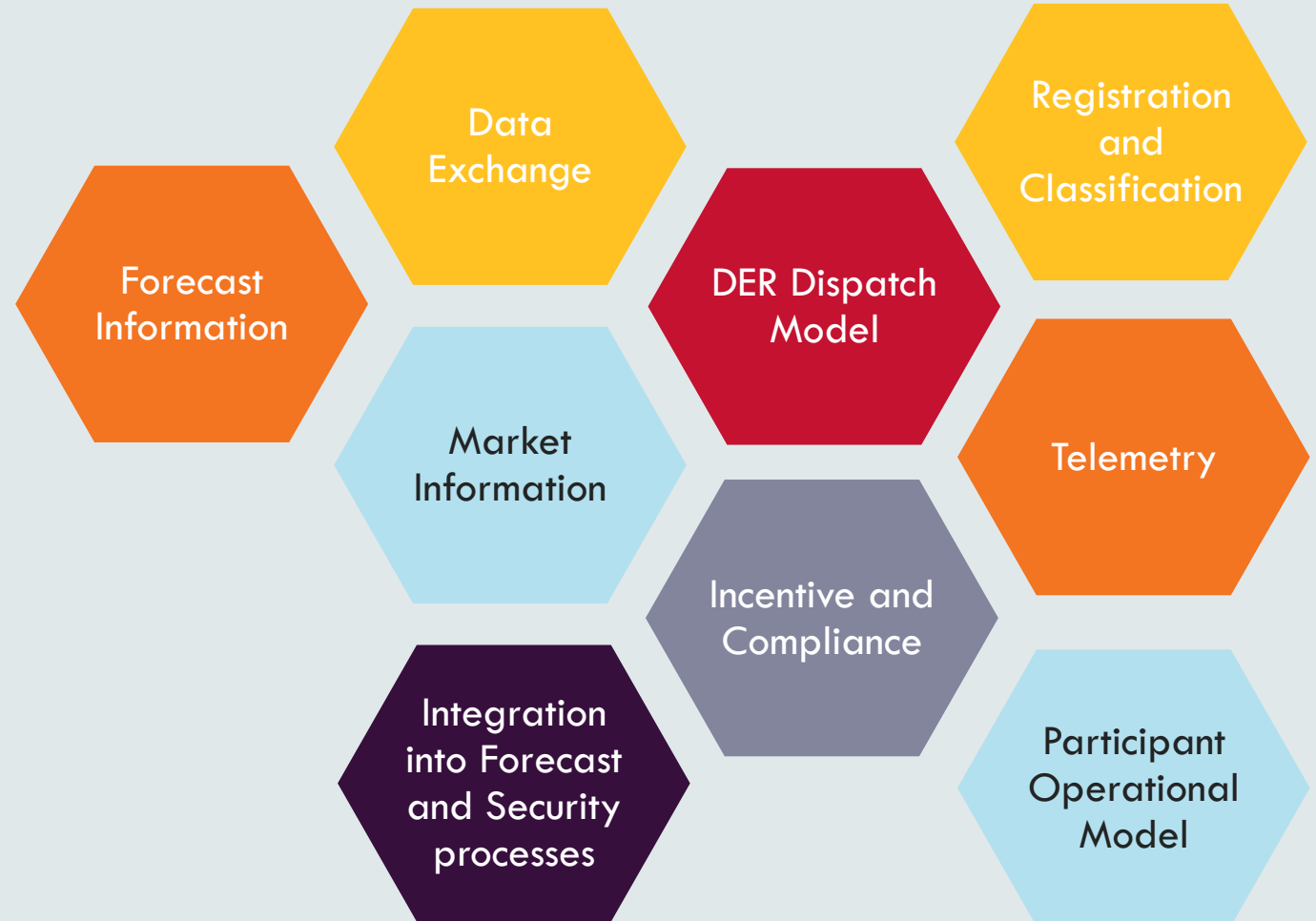
Proposal aims to lower barriers and provide incentives for non-scheduled resources to participate in scheduling processes.

Through this participation we expect better visibility of active, price responsive resources, improved scheduling outcomes and DER provision of energy and other market services.

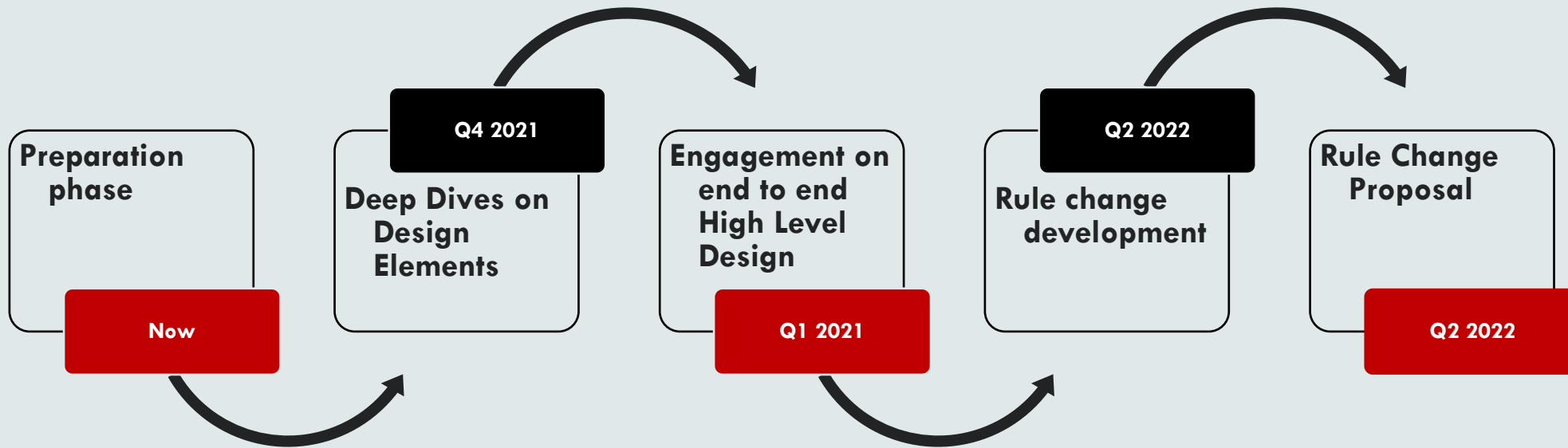
Develop models for resources to opt into:

1. Visibility Model – provision of real-time and forecast information.
2. Dispatchability Model – participation in dispatch processes.

Key Design Elements



Scheduled Lite Initiative – Engagement with DER MICF



- Aggregated DER is an important use case for the Scheduled Lite models.
- Engagement with DER MICF:
 - Build on insights from DER integration activities and initiatives,
 - Deep dive sessions to cover key design elements in detail and opportunity to collaborate with industry,
 - Coordinate development of the design with other DER integration initiatives.
- We seek your feedback on this proposed engagement and your interest in participating in this design development.

Engineering Framework

DER integration

Rama Ganguli

The NEM Engineering Framework aims to:

A

Facilitate a discussion to identify possible **future operational conditions** for the NEM power system

B

Consolidate a common view of the **current work underway across industry** to adapt the power system and existing avenues for **engagement**

C

Collaborate on **identifying where increased industry focus is needed** to bridge the gap between current work and future operational conditions



March 2021 report

- Highlights **work underway across industry**
- Introduces **focus areas**, providing a lens for identifying gaps.
- Industry workshops in April 2021.

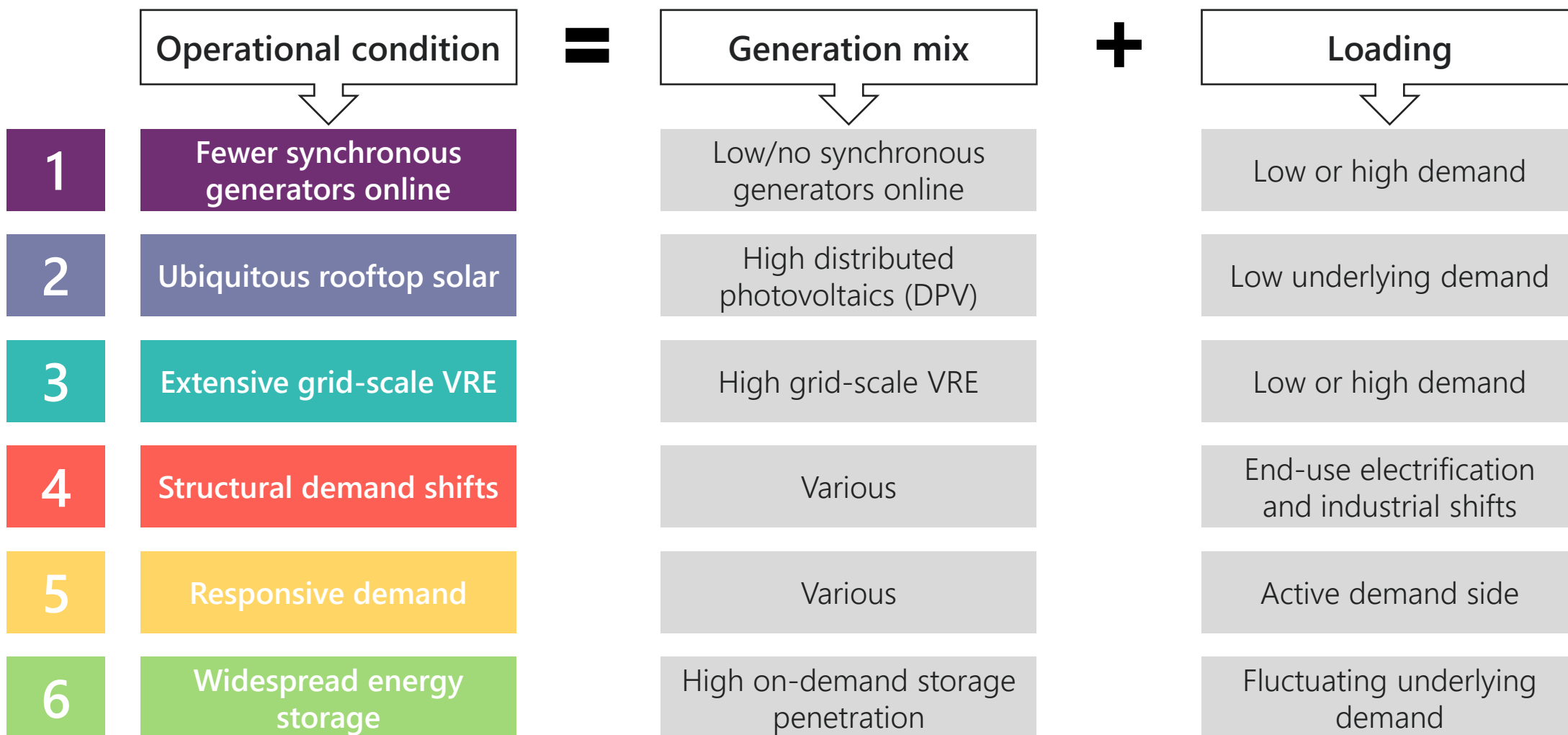
Bridging the gap

- Currently collaborating with industry to identify critical gaps that if not actioned, will make it difficult to manage the energy transition efficiently and securely.
- Will lead to the development of action roadmaps and implementation workplans.

July 2021 Operational Conditions Summary

- Identifies **operational conditions** five to 10 years ahead that will necessitate changes to current operational practices.
- Workshops in June 2021.

Identified operational conditions



Gaps

Critical items, that, if not actioned, will make it difficult to manage the energy transition efficiently and securely.

Developed by considering Operational Conditions across the different Focus Areas.

Can include:

- Gaps in our understanding that need further investigation
- Gaps in our specification of changing power system needs
- Gaps in systems or industry processes
- Gaps in market and regulatory frameworks

Operational Conditions

Fewer synchronous generators online

Ubiquitous rooftop solar

Extensive grid-scale VRE

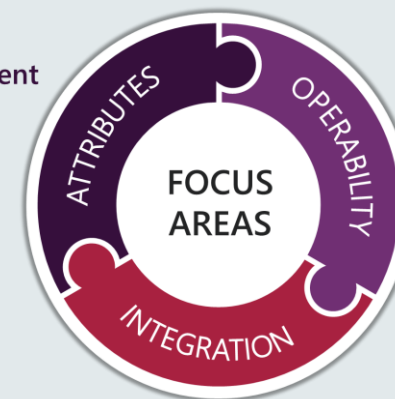
Structural demand shifts

Responsive demand

Widespread energy storage

Focus Areas

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



- Control Room and Support
- System Analysis

- Resilience
- Performance Standards
- Distributed Energy Resources

Today

Current capacity



11 GW
Rooftop PV



0.5 GW
Storage



12,000
Electric Vehicles



1.3 GW
Demand Response

Policy developments

- DNSPs increasing DER hosting capacity
- DER aggregation and coordination trials
- Wholesale demand response
- Network tariff reform for DER

Power system operation

- Managing reducing system load in the daytime
- DER performance disconnection risk
- Forecast uncertainty

5 years

Projected uptake



23 GW
Rooftop PV



4.6 GW
Storage
(28% aggregated)



700,000
Electric Vehicles



2.2 GW
Demand Response

Policy developments

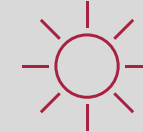
- DNSPs transition to dynamic limits for DER
- Community batteries and microgrids
- Market participation frameworks for flexible demand and DER aggregation.

Power system operation

- Continued reduction in system load, load and storage flexibility emerging
- Coordination with DNSPs and aggregators to managing locational impacts

10 years

Projected uptake



34 GW
Rooftop PV



11 GW
Storage
(42% aggregated)



4.4 million
Electric Vehicles



3.3 GW
Demand Response

Policy developments

- Future system architecture, associated roles and responsibilities

Power system operation

- Two-sided system operation, co-optimising between local and bulk power system
- Coordination with and across many parties

System operation will change dramatically in the next 10 years

March report put forward two broad objectives for DER integration ...

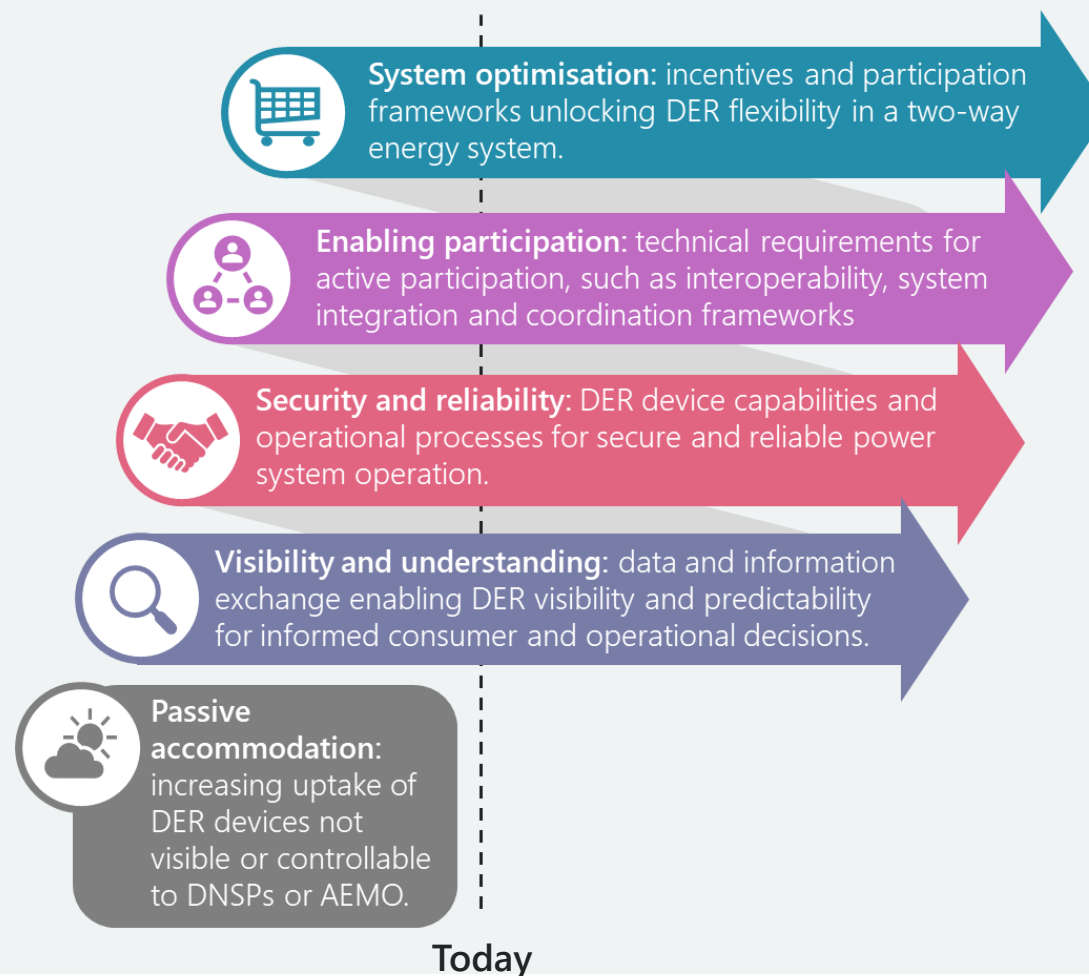


Secure and reliable system operation – as DER becomes an increasingly large component of the supply mix and interactions become more complex.

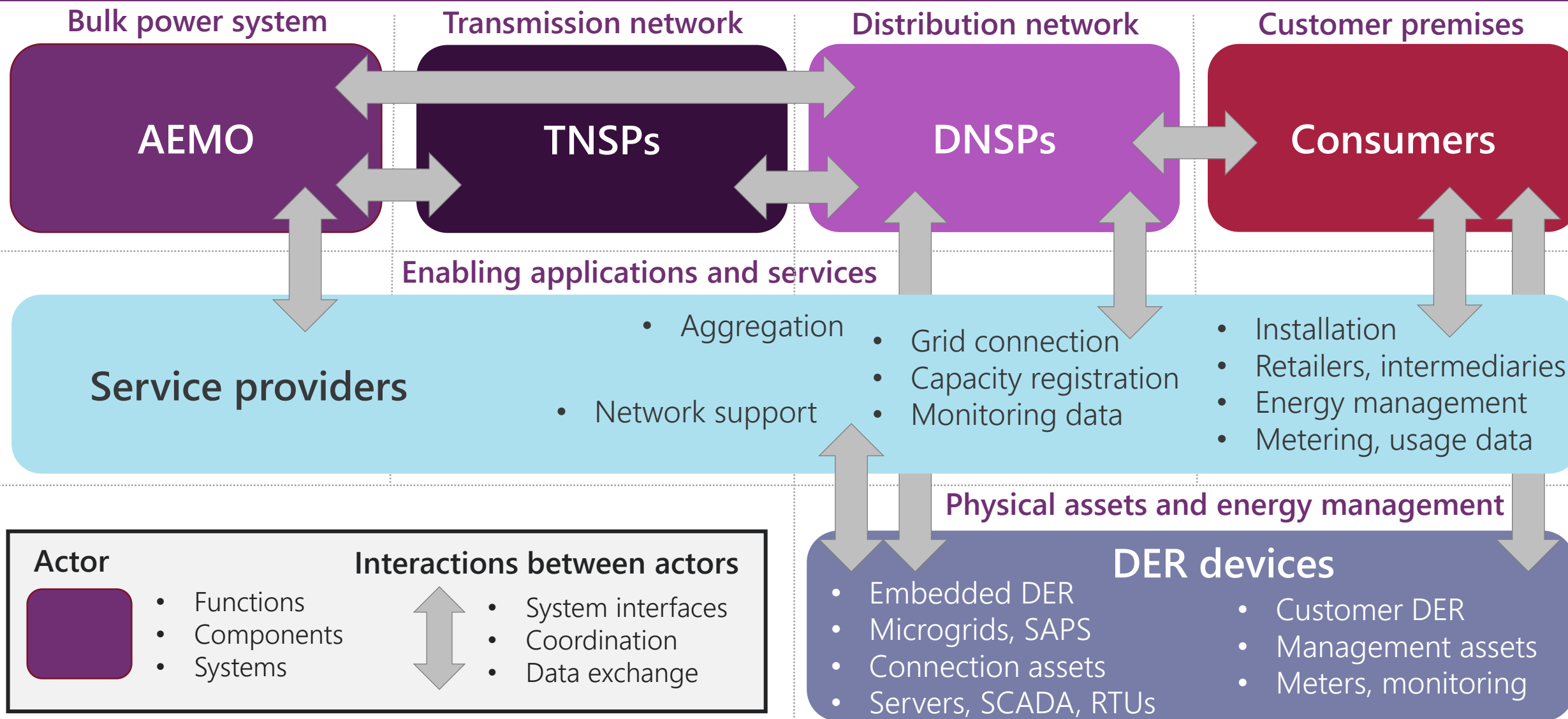


Empowering optimised consumer participation – consumers able to make informed energy choices aligned with system needs.

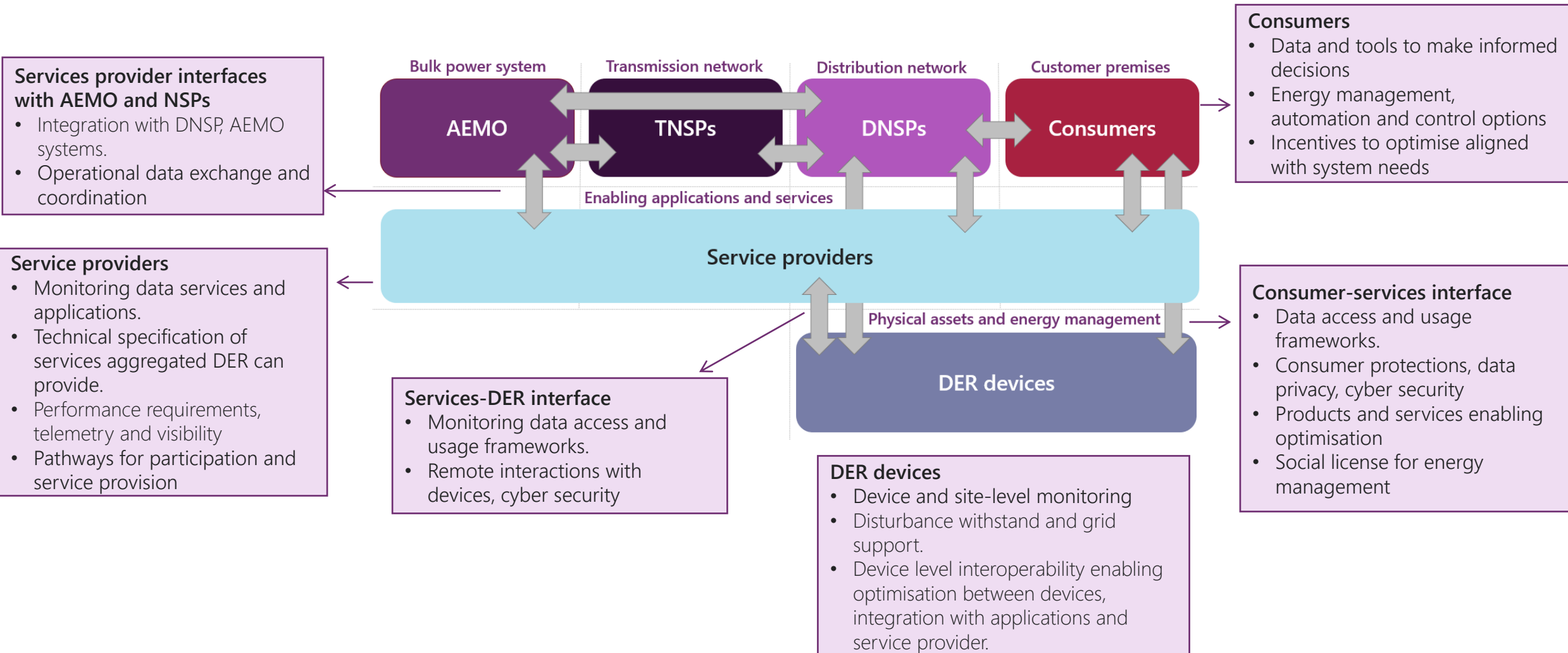
... and put forward sequence of stages for industry to collaborate towards achieving these objectives.

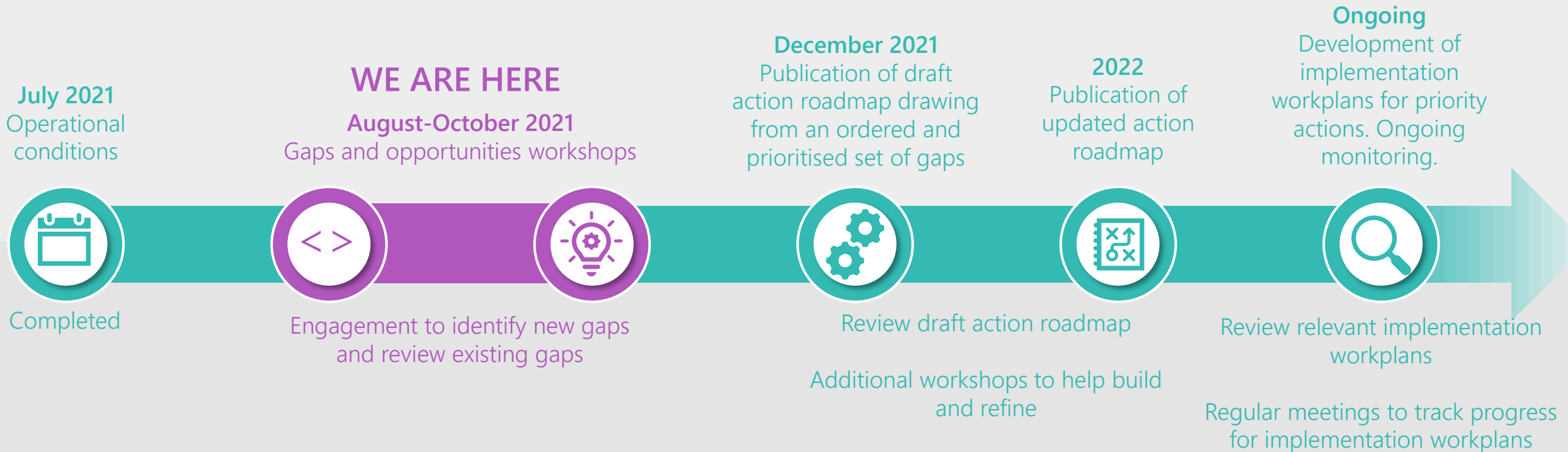


Defining actors and interactions



Areas of interest for DER MICF





To get involved, please get in touch with AEMO or sign up to our mailing list at FutureEnergy@aemo.com.au.



Q&A

Join via [slido.com](https://www.slido.com) using code #MICF

Any other business



Future Meetings & Close

Next meeting: 21 October 2021

Future Meetings

Indicative dates:

- **Thursday, 18 November 2021**

Note:

- Agenda & meeting documents will aim to be provided 5 days prior to meetings.
- Meeting actions will be distributed within 5 days post meetings (as required).
- Non-confidential information will be shared following each meeting.



Questions & contact

DERProgram@aemo.com.au