ENERGY SECURITY BOARD

POST 2025 FUTURE MARKET PROGRAM

DER INTEGRATION MDI - WEBINAR #1

30 JUNE 2020

IMPORTANT NOTES

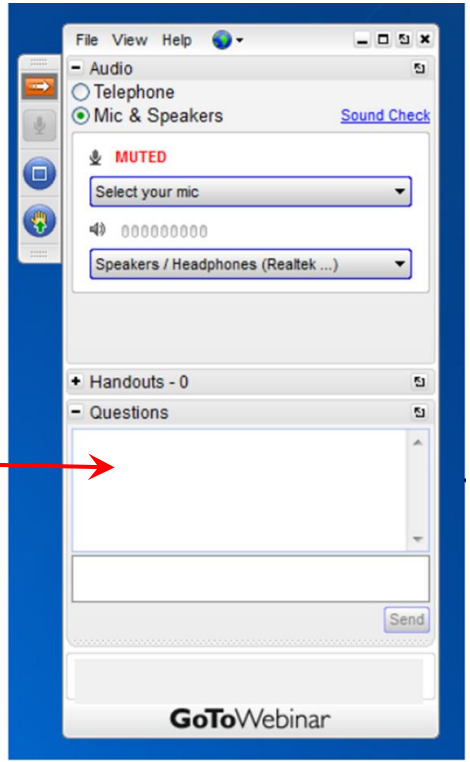
- These slides are solely for workshop purposes only. The content provides general information to support informed stakeholder engagement and foster a diversity of thinking and feedback.

- The presentation does not represent the official position of the Energy Security Board or any related body.

- The webinar is being recorded and a link to the recording will be provided after the webinar.

WEBINAR-WORKSHOP LOGISTICS

- All participants are currently in listen-only mode
- We will pause periodically for discussion. Please use the **Raised Hand** to signal that you would like to speak.
- If you would like to record a comment without discussion, feel free to type it into this field.



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P2025 PROGRAM CONTEXT

POST 2025 FUTURE MARKET PROGRAM (P2025)

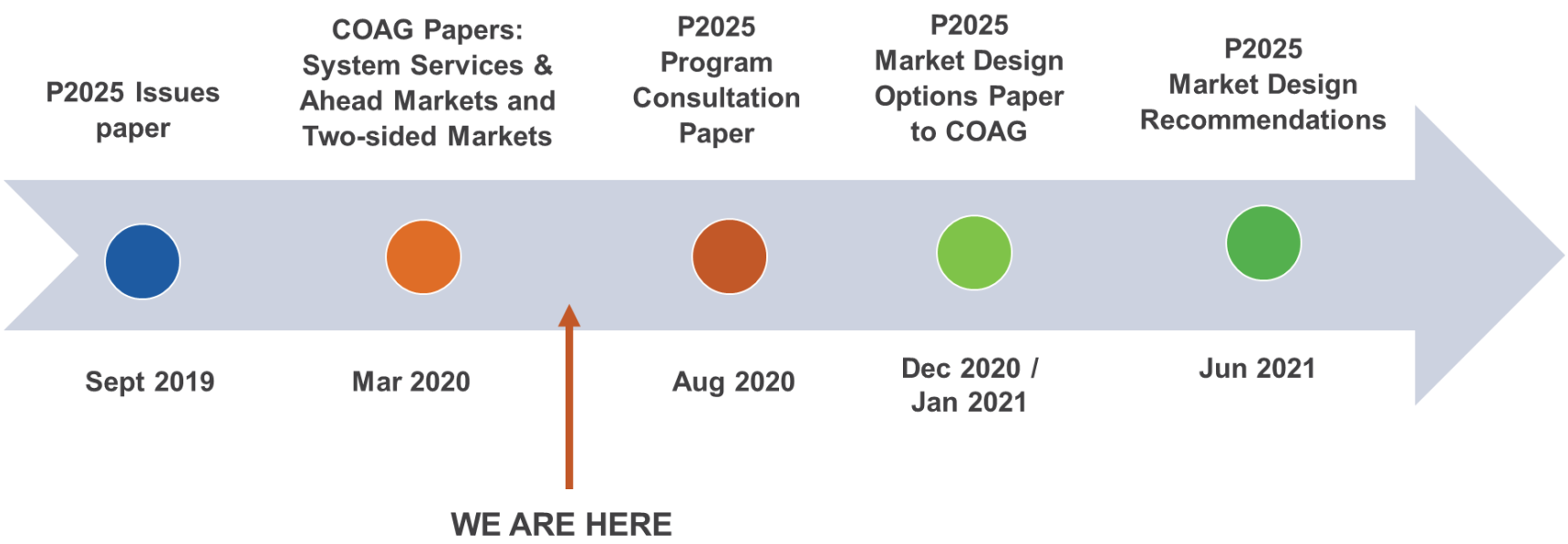
The COAG Energy Council tasked the ESB with developing advice on a

long-term, fit-for-purpose market framework

to support reliability that could apply from the mid-2020's.

The ESB needs to recommend any changes to the existing market design or recommend an alternative market design to enable the provision of the full range of services to customers necessary to deliver a secure, reliable and lower emissions electricity system at least-cost.

P2025 PROGRAM – KEY DELIVERABLES



SPECIFIC CHALLENGES

Missing markets

We currently have no market mechanisms to value and price inertia and system strength – services traditionally provided at no cost by thermal plants. Unless addressed, this issue will become acute over the next two decades.

Increasing complexity, uncertainty and variability

Increasing complexity, uncertainty and variability are making the task of coordinating resources while maintain system security more difficult. This is leading to more directions. Without changes, this situation will become unmanageable as the penetration of IBR increases.

Managing network constraints

By 2040, installed capacity will need to grow from ~50GW to ~90GW to meet roughly the same peak demand. This will mean that at times parts of the network will be increasingly congested and constrained and flows will be much more dynamic. Participants will need tools to manage the associated risks.

Investment in dispatchable capacity

There remain concerns around the market's ability to bring forth the future investment in the dispatchable plant required to replace coal generation as it retires. And if the timing timing of exits and entries will enable the current market to respond appropriately.

Poorly valued and integrated DER

Currently most small customers are unable to effectively respond to price signals and reveal their intentions to the market. The same customers are also locked out of the market for system services. This penalises consumers and costs the system.

Cross market optimization of DER

DER has the potential to offer system benefits at the network, spot market and system services levels. There are insufficient tools to schedule and optimize participation across these (potential) markets.

STRATEGIC PRIORITIES – WHAT IS CHANGING?

1. Managing increasing variability, uncertainty and complexity

2. Timely and efficient capital replacement

3. Meeting consumer needs

4. DER Integration

Max instantaneous penetration of wind and solar

50% → **100%**

- Growing challenges with maintaining secure dispatch with high VRE and lower minimum demand
- Increasing penetration of VRE and IBR as proportion of resources across NEM
- Exponential increase in combinations of resources to co-optimise for secure dispatch of energy and services

61% of current coal generation will exit the system by 2040

- Declining combination of resources to ensure secure dispatch
- Increasing need for definition and provision of services that support system security
- Rapidly increasing demand peaks – greater need for dispatchable resources
- Increased need for signals to ensure timely and efficient investment in networks and resources

Proportion of engaged demand and DER

- Customer expectations not being consistently met with energy as an essential service
- Changing demand patterns reflect increasing uptake of DER across community
- Growing digitization of economy providing increased opportunities to engage customers where they want to be met
- Increased need for complementary market and regulatory arrangements to improve outcomes for all customers

Systems, tools, arrangements to adapt over the transition in proportion to evolving needs

Combination of market and regulatory arrangements, tech standards, and incentives to meet changing needs

MARKET REFORM DESIGN FEATURES

Based on these strategic priorities, the P2025 project team will design features to guide market reform.

1 Market reforms should broadly preserve the principles of **self-commitment and self-scheduling, based on incentives rather than penalties.**

2 **The market design should drive efficient entry and exit of resources throughout the transition.** Where it is likely this will not occur, non-market mechanisms may need to be considered.

3 The **relative roles of AEMO and NSPs** respectively, in operating the high and low voltage systems **should not fundamentally change.**

4 **Risks are allocated appropriately to those best able to manage them**

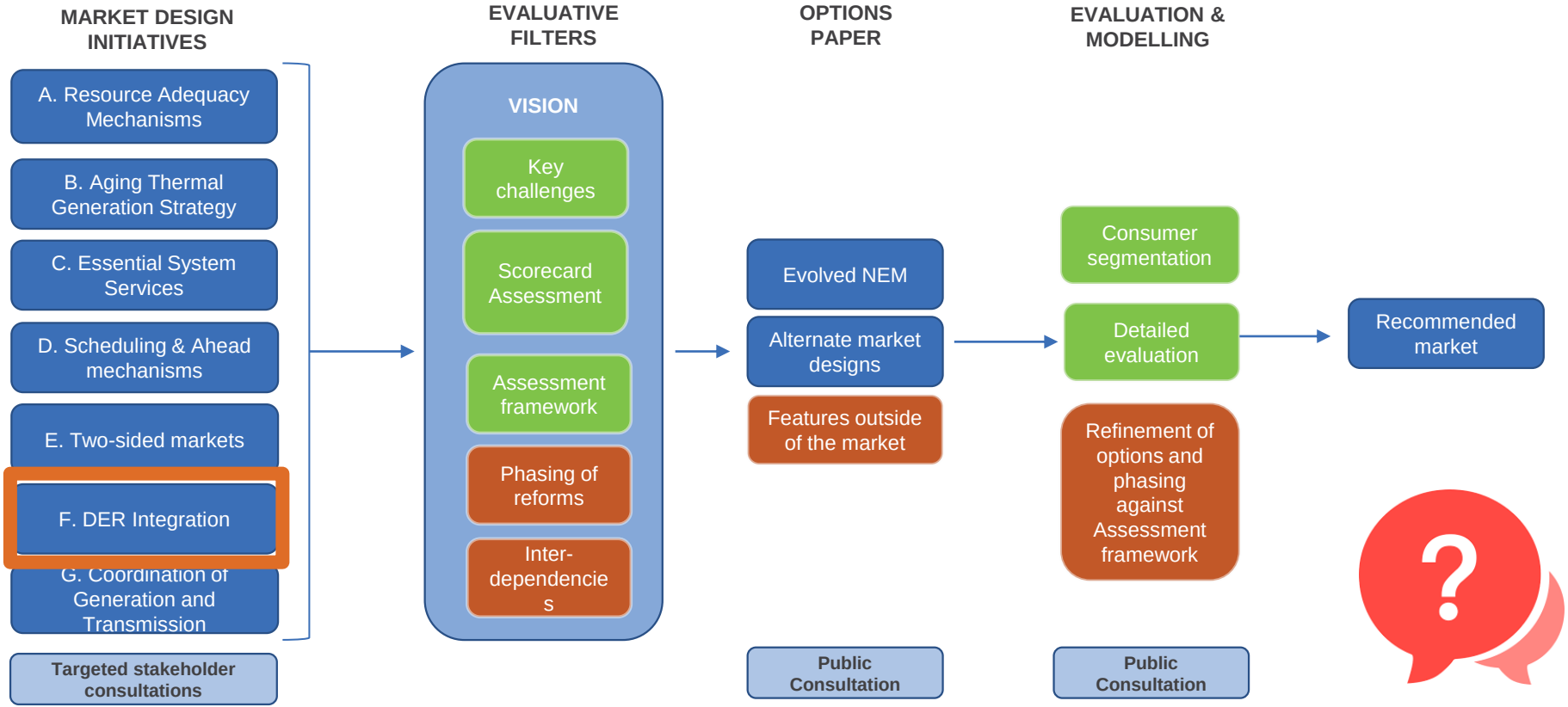
- Technology risk (incl. technology obsolescence risks) is best borne by market participants
- Governments, market participants and C&I customers may need to share (long-term) demand risk.
- Governments should be responsible for policy risk (recognising that policy decisions will ultimately be paid for by consumers)

5 **Markets must have depth and liquidity.** Where depth and liquidity are not possible likely that other mechanisms will be designed.

6 Market design needs to enable participants to **satisfy social licence requirements**.

7 Market design needs to provide a suite of effective price signals, regulations and incentives to integrate DER into the wholesale, network services and local markets to unlock the full value of DER for its owners and the system.

P2025 PROGRAM ARCHITECTURE



WEBINAR PURPOSE & CONTEXT

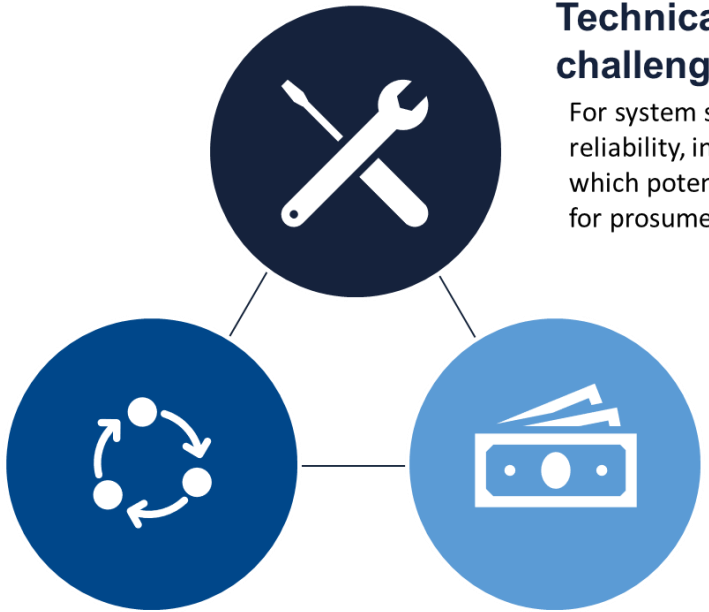
WEBINAR PURPOSE / OBJECTIVE

- Provide an overview of how DER Integration is being addressed within the P2025 program
- Identify how this work relates to other parallel DER initiatives
- Invite questions and discussion from the MDI Focus Group
- Confirm next steps / engagement opportunities

DER INTEGRATION WORKPLAN

Technical and operational challenges

For system security and distribution network reliability, including DER visibility and standards – which potentially limit or reduce the value of DER for prosumers and consumers



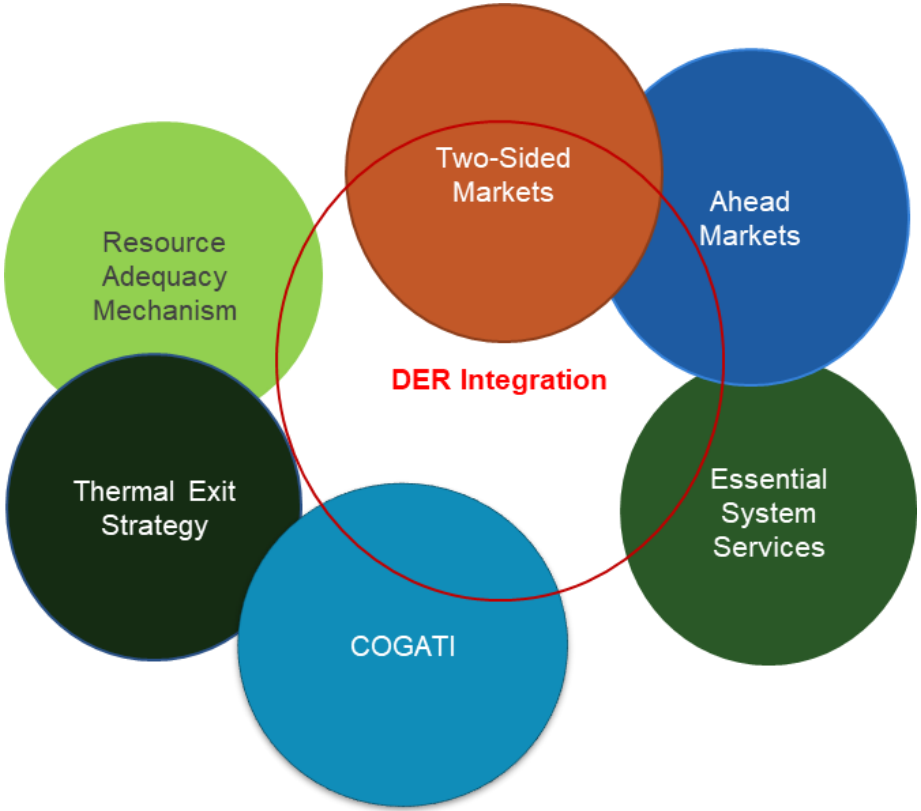
Regulatory and planning challenges

Include ringfencing regulation and integrated planning to optimise the benefits of DER integration

Market and business model challenges

Electricity markets and DNSP business models need to be updated to support the benefits and minimise the costs of DER integration for all consumers

DER INTEGRATION LANDSCAPE IN THE P2025 PROGRAM



DER INTEGRATION MDI – OVERVIEW OF APPROACH

DER INTEGRATION IN P2025 PROGRAM

- **Objective:** Optimise DER for the benefit of all energy system users
- **AEMO & AEMC jointly leading** with oversight from the ESB DER Steering Committee
- Initial focus will be to **test how DER is considered in other MDI design options** and what the implications are for DER integration – consumers, DER Owners, distribution networks, and overall electricity system
- The question of **Distribution Level Markets** are not anticipated to be addressed by P2025 DER integration at this stage, however designs should allow for these to emerge.
- **ITP/KPMG** engaged by the ESB to write an **initial briefing paper** that seeks to provide a summary of the activities, trials and changes contemplated to support DER integration and as a starting point for discussions/interviews with other MDIs.

THE BRIEFING PAPER CATEGORISES DER INTEGRATION CHALLENGE IN 4 KEY AREAS:

Consumer	• Non-economic (as well as economic) signals drive DER uptake and engagement of DER within the NEM • Trust will need to be earnt for DER owners and consumers to re-engage with the NEM • Incentives for DER need to be aligned (wholesale, network, retail) • Tariff reform will be important (DEIP Access and Pricing +)
Technical	• Hosting capacity and voltage levels will vary in distribution networks affecting DER ability to access Wholesale and FCAS markets • Technical standards for inverters as well as interoperability and cyber security will be required • A rule change and a governance review process for technical standards are underway
Commercial	• Battery uptake is increasing but the customer engagements is not guaranteed • EV charging and V2G technologies and business models are emerging • DER Aggregators and Consumers will want to value stack – role of DNSP, network services, modular networks and local markets need to be defined
Regulatory	• Visibility and Technical Optimisation are the first steps to DER integration followed by Market integration • Distribution Level Markets will need consideration and future regulatory reform • P2025 may need to define the role of the DNSP to ensure efficient DER integration

A SERIES OF MDI INTERVIEWS ARE UNDERWAY

- ITP/KPMG are completing a series of interviews with each of the other MDIs
  - COGATI
  - Essential System Services
  - Resource Adequacy Mechanism
  - Thermal Generation Exit Strategy
  - Two-Sided Markets
  - Ahead Markets
- How will uptake of DER impact these P2025 reforms?
- Will these P2025 reforms facilitate or put up barriers to DER uptake and value creation?
- Are there any interdependencies related to DER across the initiatives?

DER INTEGRATION: KEY CHALLENGES BEING CONSIDERED

In order to optimise DER for all system users, the DER Integration MDI will address the following challenges, amongst others:

- Current market design does not include **participation models** that make it simple for DER to provide services into all markets, and **simple for customers to understand** the value of making their DER available to the market.
- Current market design does not expose DER to **price signals** to encourage the optimal DER operation, or align risks to those who benefit from DER.
- Current market design does not accommodate **appropriate requirements** for DER to become active in the Wholesale and FCAS markets (Forecasting, Metering, Scheduling, Dispatch, SCADA etc) that balance system security and market efficiency with the highest volume of aggregated DER integration.

DER INTEGRATION : QUESTIONS?

- Are there specific themes or issues that DER integration should address?
  - What are the limits to a market-based approach to DER integration?
    - What aspects of DER operation need to be regulated?
  - Should the P2025 address other DER market design challenges not included already?
  - Other questions?

DER INTEGRATION: NEXT STEPS

- Interim and Final Report from ITP/KPMG will be considered by the DER Steering Committee
- DER Integration MDI will provide input into P2025 Consultation Paper (August 2020):
    - Make specific recommendations for each MDI
    - Identify further work to be done on DER Integration highlighted by other MDIs
- Upcoming DER Integration MDI Webinars:
    - Webinar #2: 21 July 2020
    - Webinar #3: ~28 July 2020 Open Mic Q&A