Energy Security Board

Post 2025 Market Design Project

Update to National Consumer Roundtable

APRIL 2021

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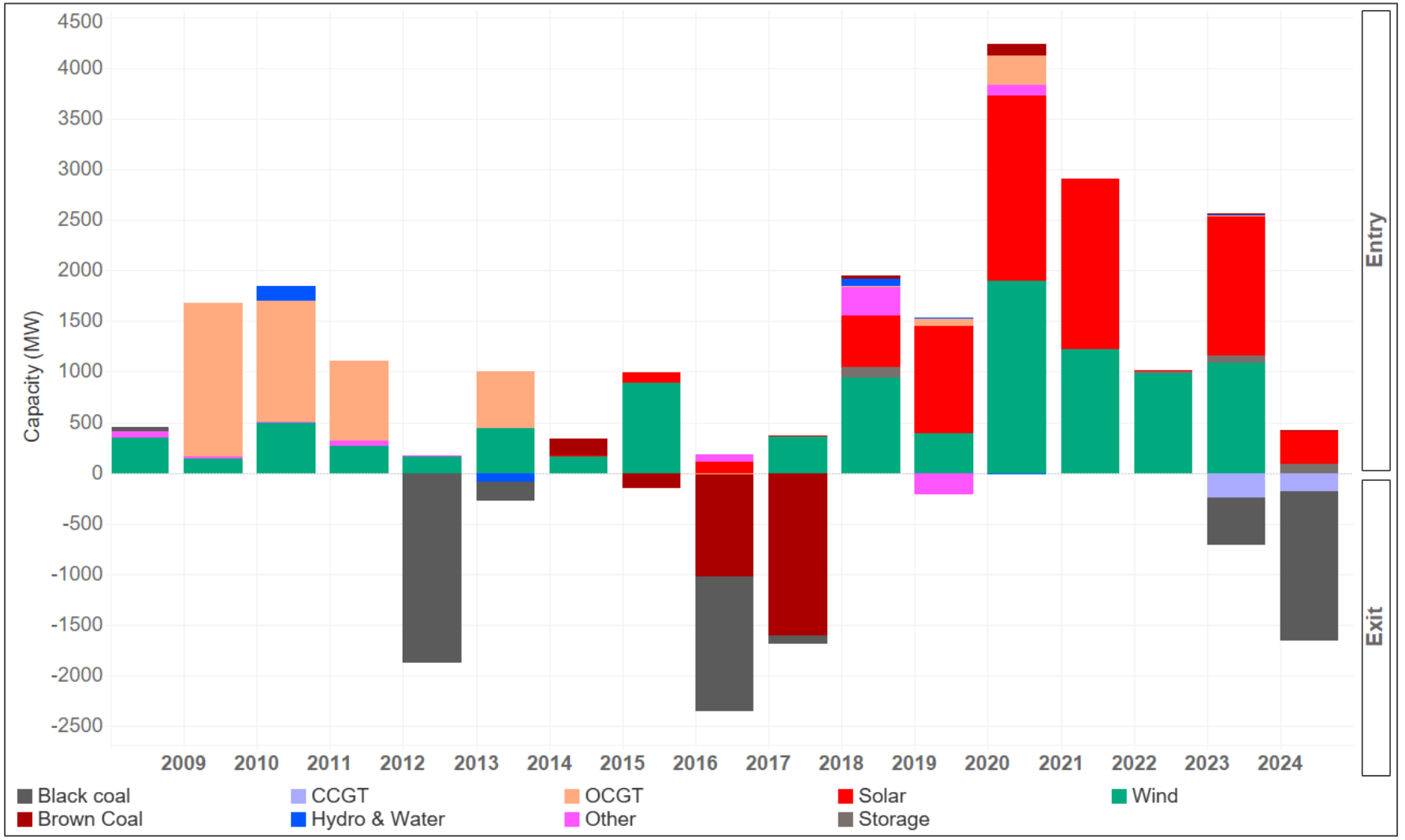
POST-2025 PROGRAM – TIMELINE OF KEY DELIVERABLES

- **April 2021** – Options paper to set out further detail for each pathway for evaluation and consultation
- **Mid 2021** – final recommendations and implementation program

THE GENERATION AND RESOURCE MIX IN THE NEM IS RAPIDLY CHANGING

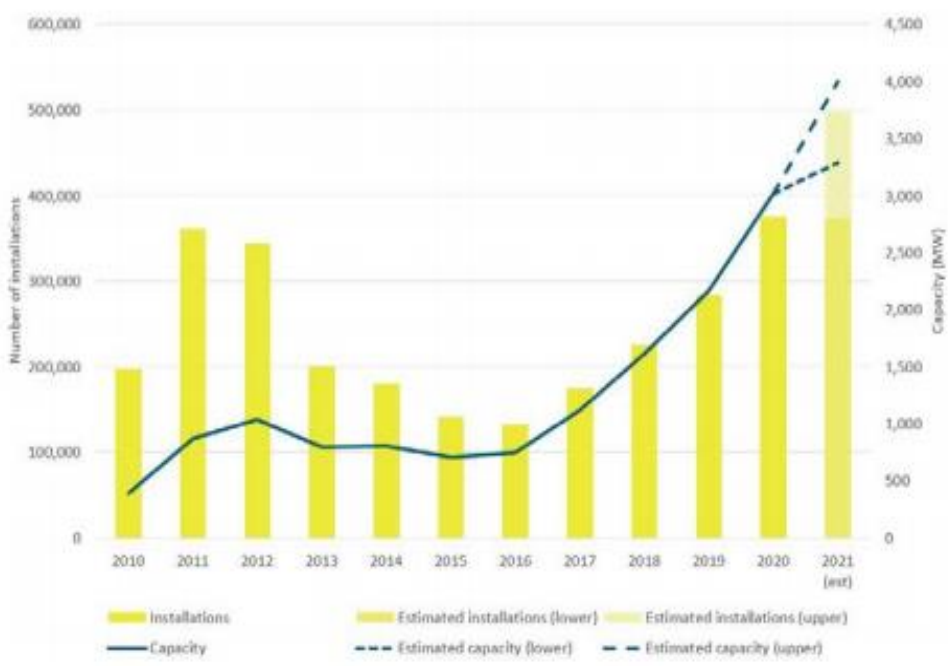


- **Up to 63% of the current coal and gas fleet in the NEM retires by 2040.**
- **26-50 gigawatts (GW) of new large-scale variable renewable energy and 13 – 24 GW of distributed PV forecast to come online in the same period.**

Source: Analysis of AEMO MMS database, AEMO Generator Information Page

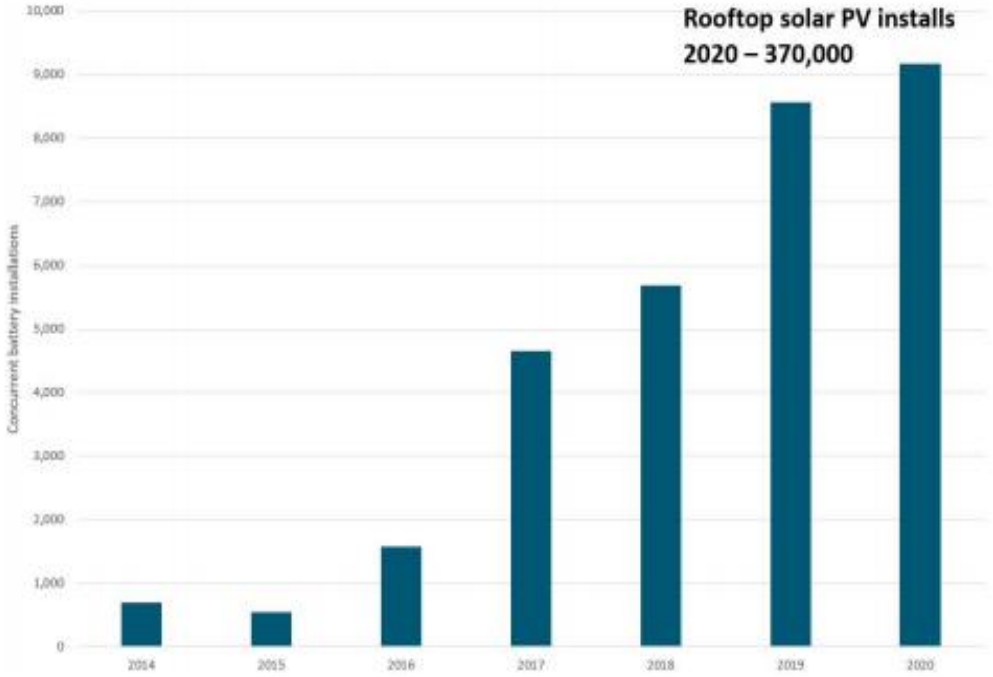
UPTAKE IN DISTRIBUTED ENERGY RESOURCES IS EXCEEDING FORECASTS – AND CONTINUING AT A RAPID PACE

SRES rooftop solar PV capacity and installations - National



Note: PV systems installed in the NEM represent 87% of the national total

Concurrent battery storage installations - National

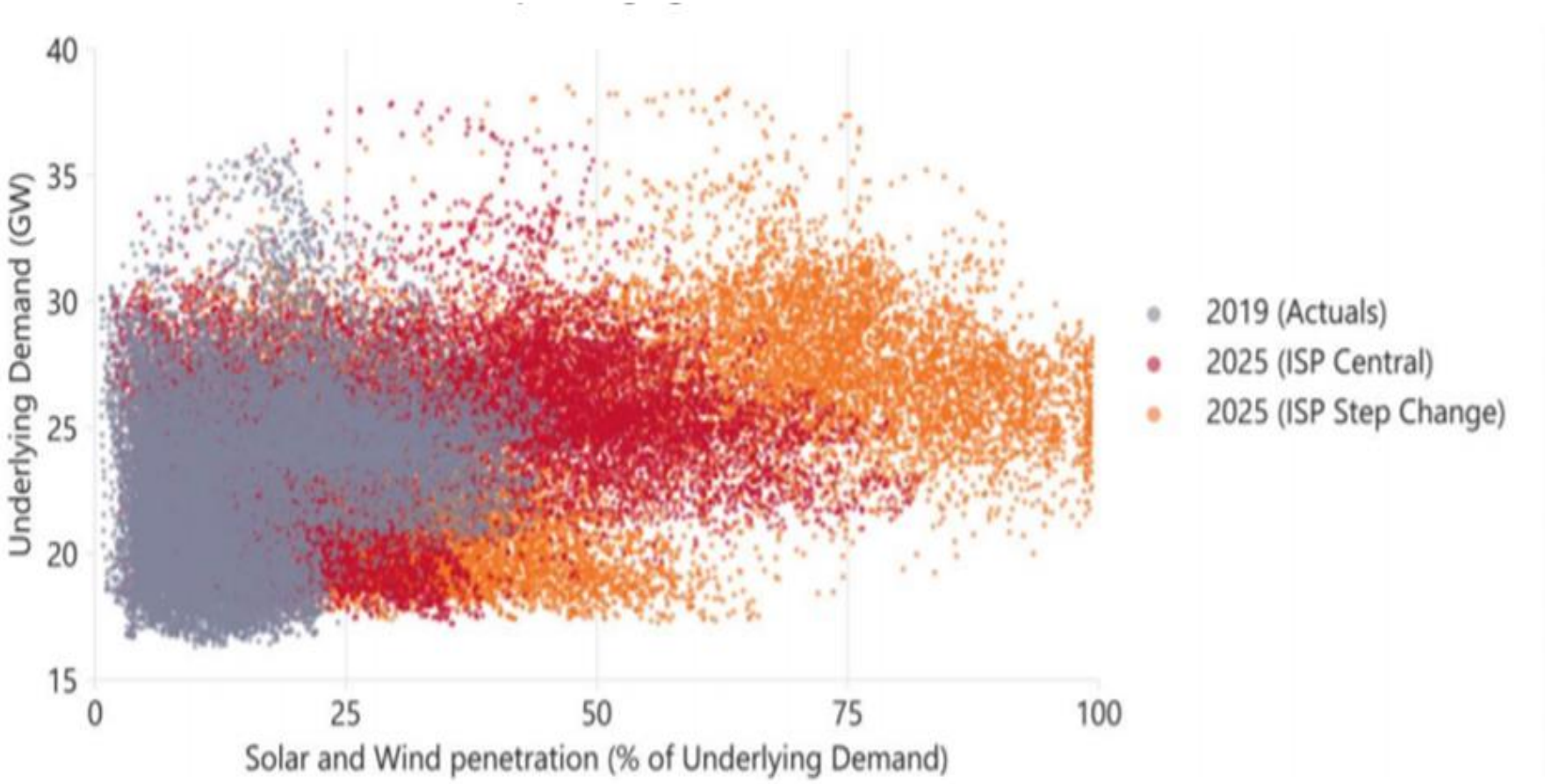


Note: Concurrent battery storage installations are voluntarily disclosed to the CER, so these figures likely under report the actual number of small-scale battery installations.

- **There are over 2.66 million rooftop solar power systems installed in the NEM as of 2020.**
- **This equals approximately 14GW of installed capacity, over 21% of homes have rooftop solar PV installed.**

Source: Clean Energy Regulator

MORE 'VARIABLE' WEATHER DEPENDENT RESOURCES ARE ENTERING THE MARKET – AND MORE 'DISPATCHABLE' RESOURCES ARE EXITING

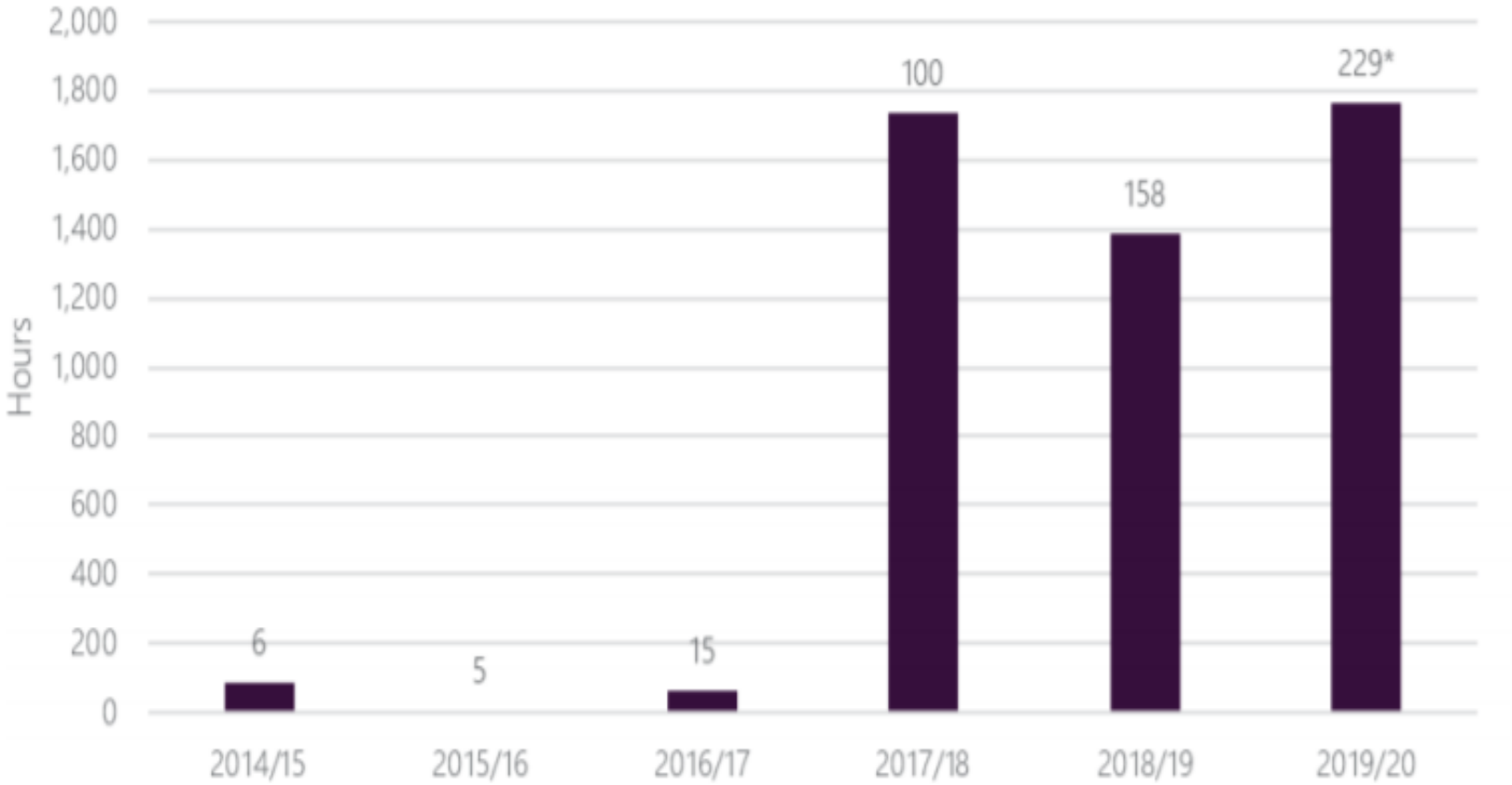


Source: AEMO Renewable Integration Study

- **Although the fundamental power system requirements remain unchanged, the type and composition of resources, and their configuration on the grid, is changing rapidly.**

- **The pace of penetration for variable renewable energy resources is already exceeding the AEMO ISP Step Change scenario.**

AS SYSTEM OPERATOR, AEMO IS HAVING TO INTERVENE IN THE MARKET MORE REGULARLY TO KEEP THE GRID SYSTEM SECURE AND STABLE

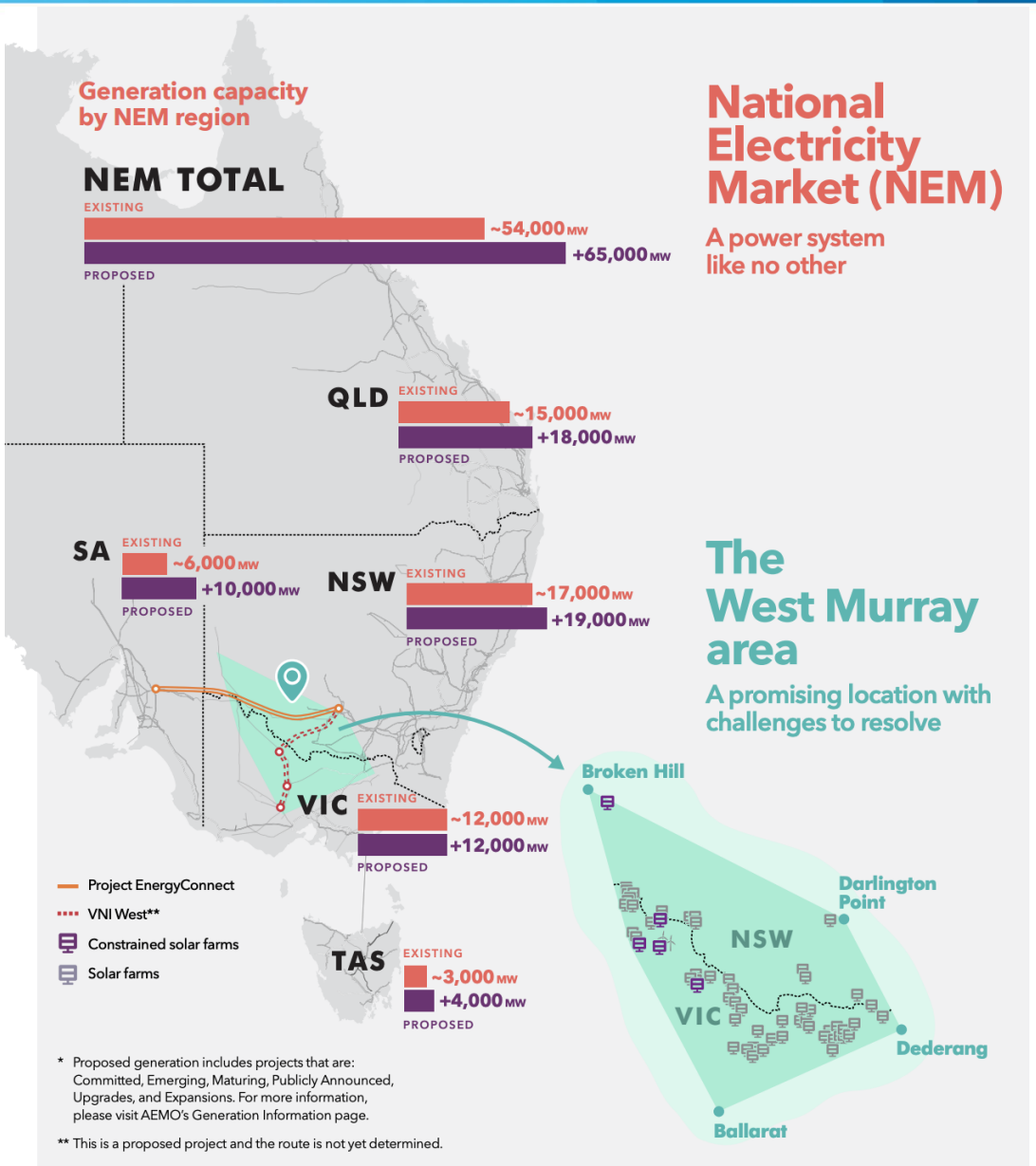


*Incomplete year; data current at 5 March 2020.
Note: values above each column represent number of directions issued.

Source: AEMO

- **Interventions taken by AEMO to ensure adequate system strength.**
- **Unbundling of essential system services is important. This will enable parties (demand or supply based) that can deliver those essential system capabilities to offer these to the market.**

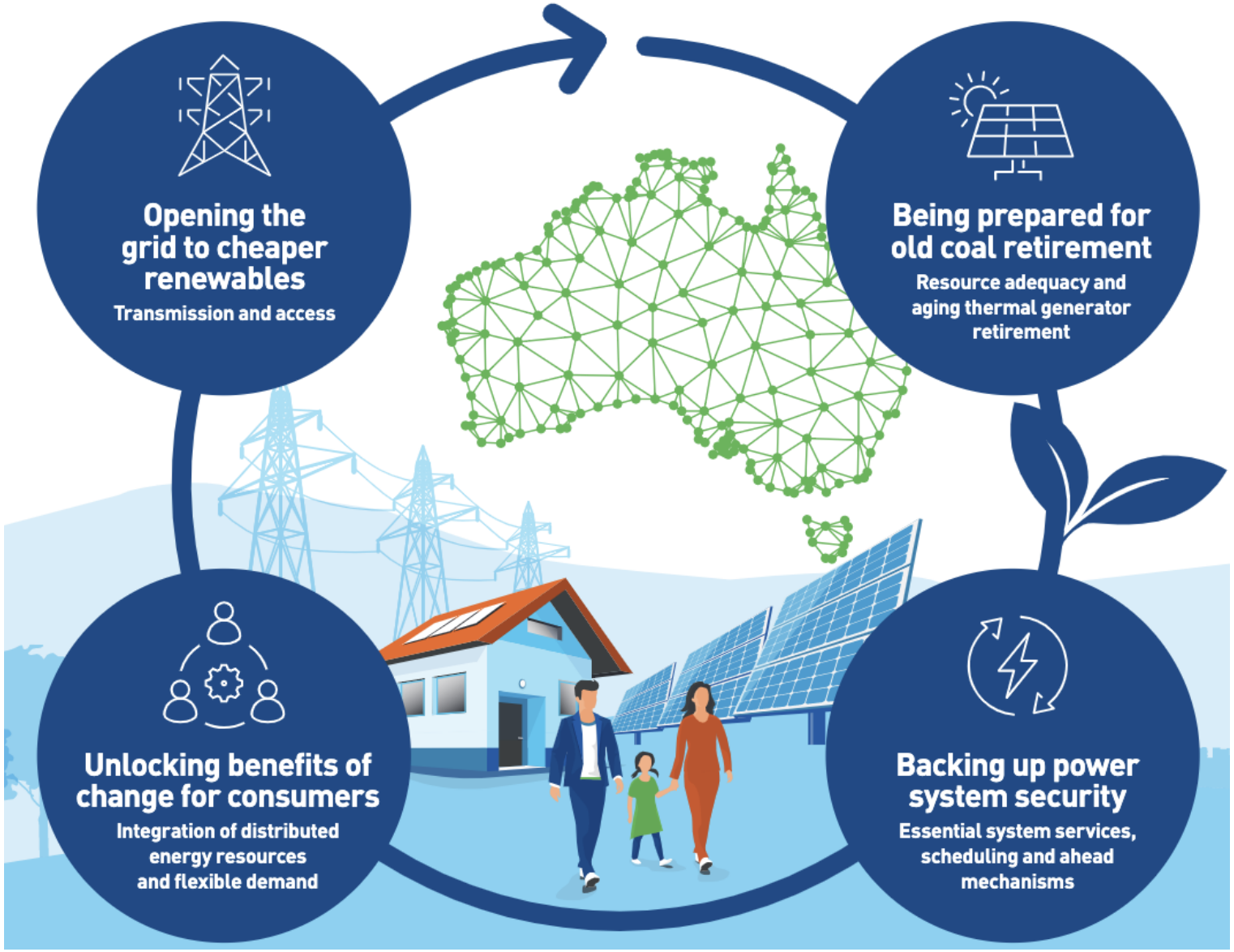
TRANSMISSION INVESTMENT IS NEEDED TO SUPPORT CONNECTION OF NEW RENEWABLE PROJECTS.



- Significant transmission investment is needed for the 26-50 GW additional renewable generation expected by forecast 2040.
- Need to incentivise efficient location decisions to avoid congestion and reduce costs to consumers.
- Efficient transmission investment will also facilitate the increase in large-scale battery deployment – currently 327 MWh and estimated to be 900MW by 2024 – and emerging technologies such as hydrogen.

Source: AEMO

THE ESB HAS BEEN WORKING WITH STAKEHOLDERS TO DEVELOP A PACKAGE OF REFORMS – TO MEET THE NEEDS OF THE ENERGY TRANSITION AND BEYOND 2025



- Reform directions set up across each of these core design areas
- Pathways of reforms – no ‘big bang’
- Given urgency of issues – work has already begun across a number of areas

PROPOSED TRANSITION PATHWAY FOR REFORM - RESOURCE ADEQUACY AND AGING GENERATOR RETIREMENT

Immediate reforms | **Initial reforms** | **Next reforms**

Resource Adequacy Mechanisms and Aging Generation Retirement

Notice of closure rules: Nov 2018

Interim Reliability Measures

Generator exit mechanisms
- Increased information (mothballing); seasonal shutdowns
- Expanding notice of closure requirements
- Integrated process: for early closure

Contingent scenario planning

Options for Modified RRO
- Financial: remove current T—3 trigger assessment @P50+
- Physical: certificates, minimal triggers, assessment @P50+/use of RERT

Operating reserve mechanism
(considered in ESS stream)

Monitoring reliability and overall costs
- Following implementation of P2025, monitoring to ensure there is the necessary mix of resources, including those with low capacity factors to maintain reliability e.g. pumped hydro

NEM wide approach to jurisdictional investment schemes
- Enhancement to information provision
- principles for national consistency

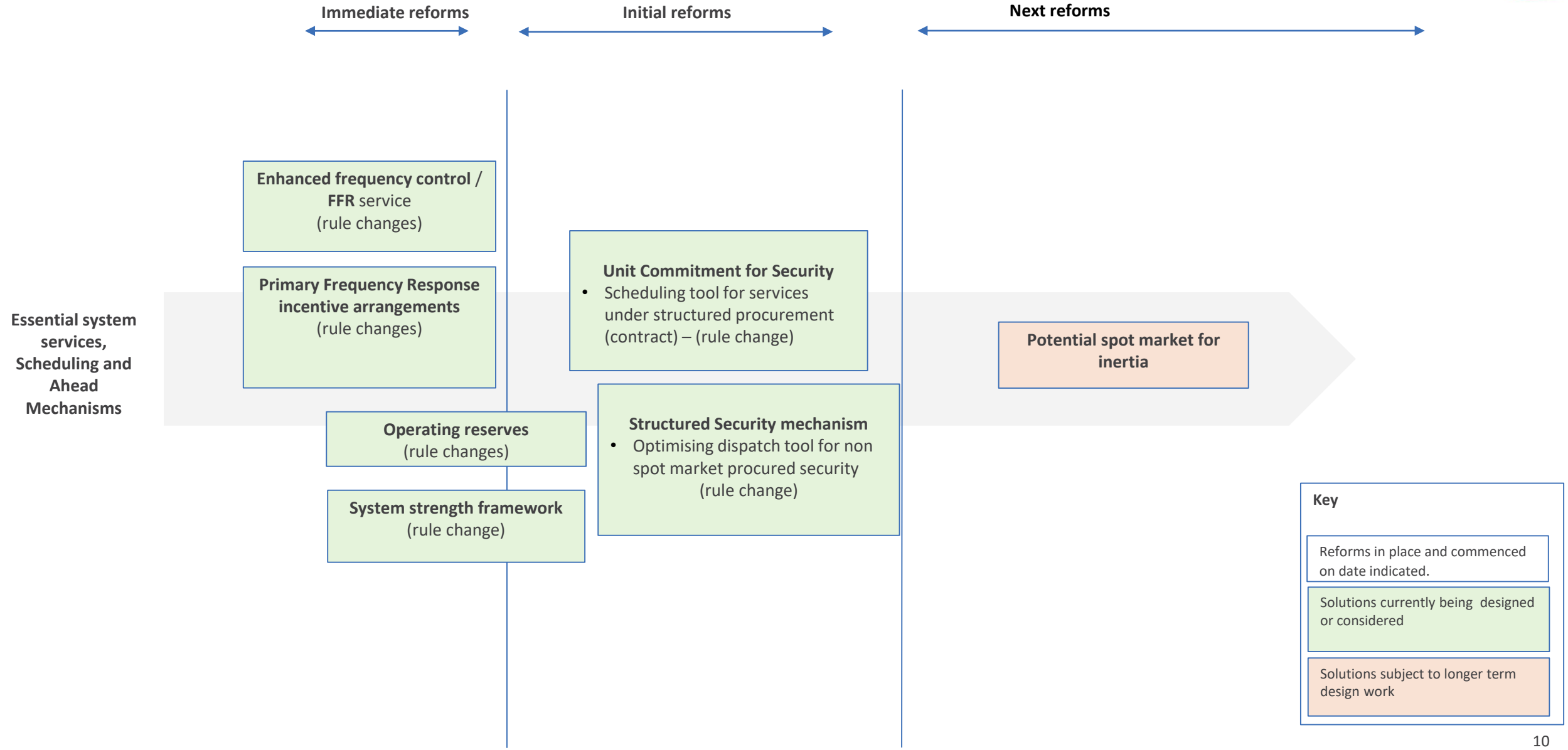
Key

Reforms in place and commenced on date indicated

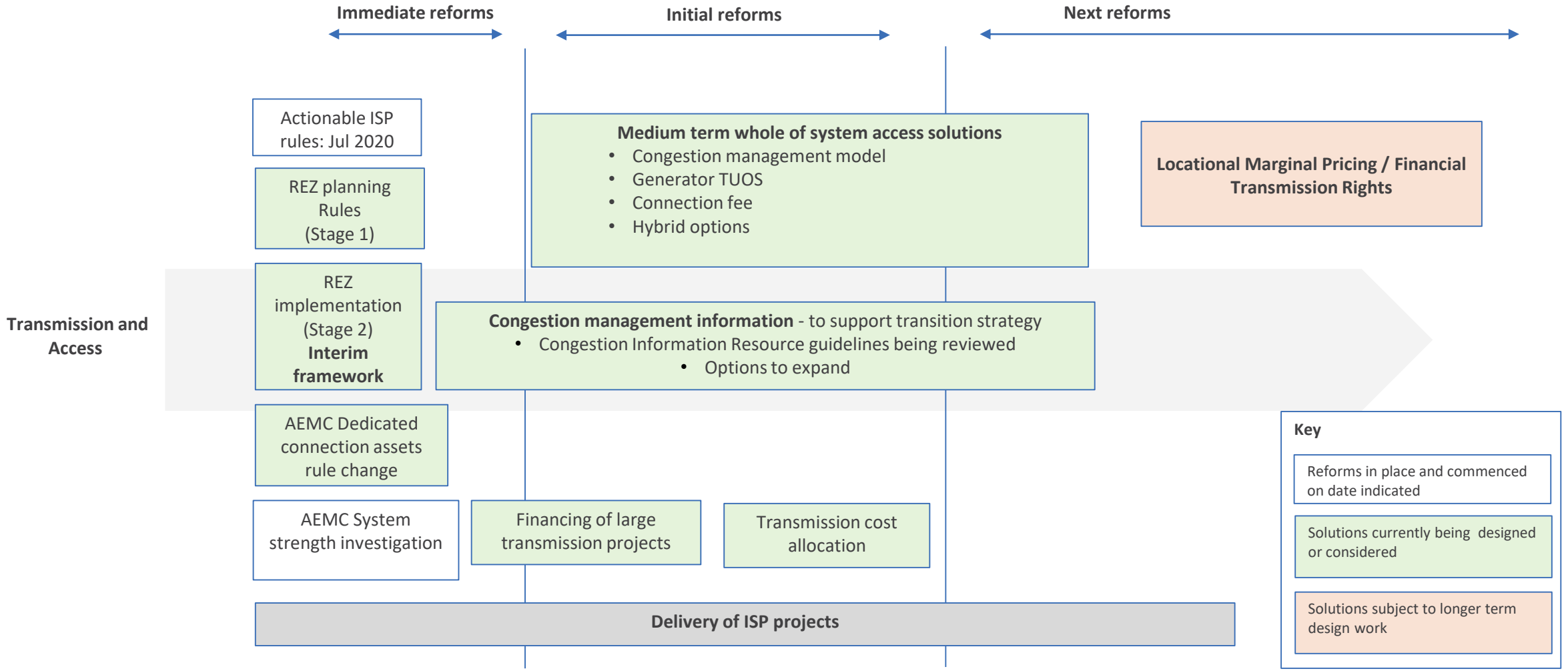
Solutions currently being designed or considered

Solutions subject to longer term design work

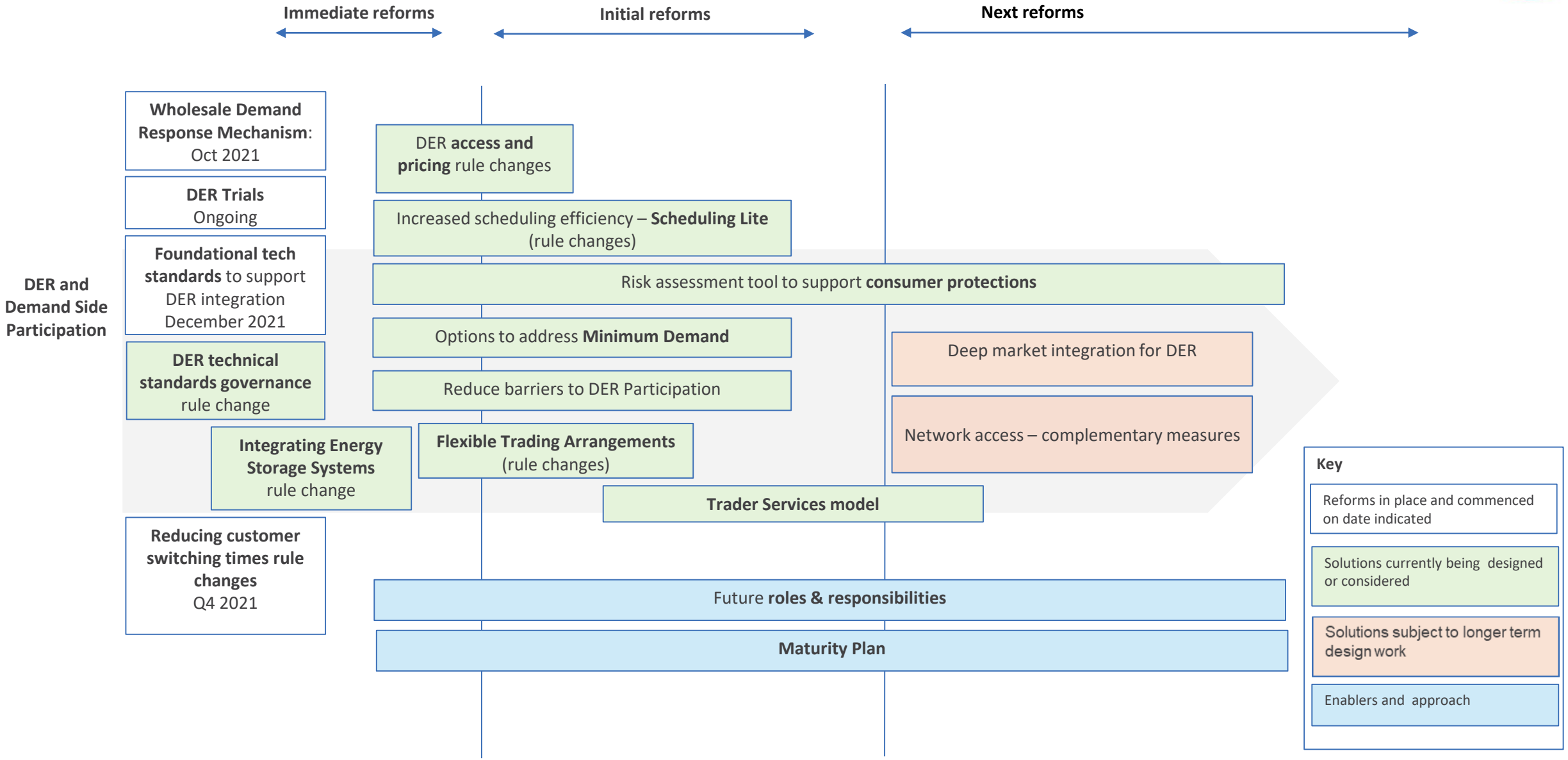
PROPOSED TRANSITION PATHWAY FOR REFORM - ESSENTIAL SYSTEM SERVICES, SCHEDULING AND AHEAD MECHANISM



PROPOSED TRANSITION PATHWAYS FOR REFORMS – TRANSMISSION AND ACCESS

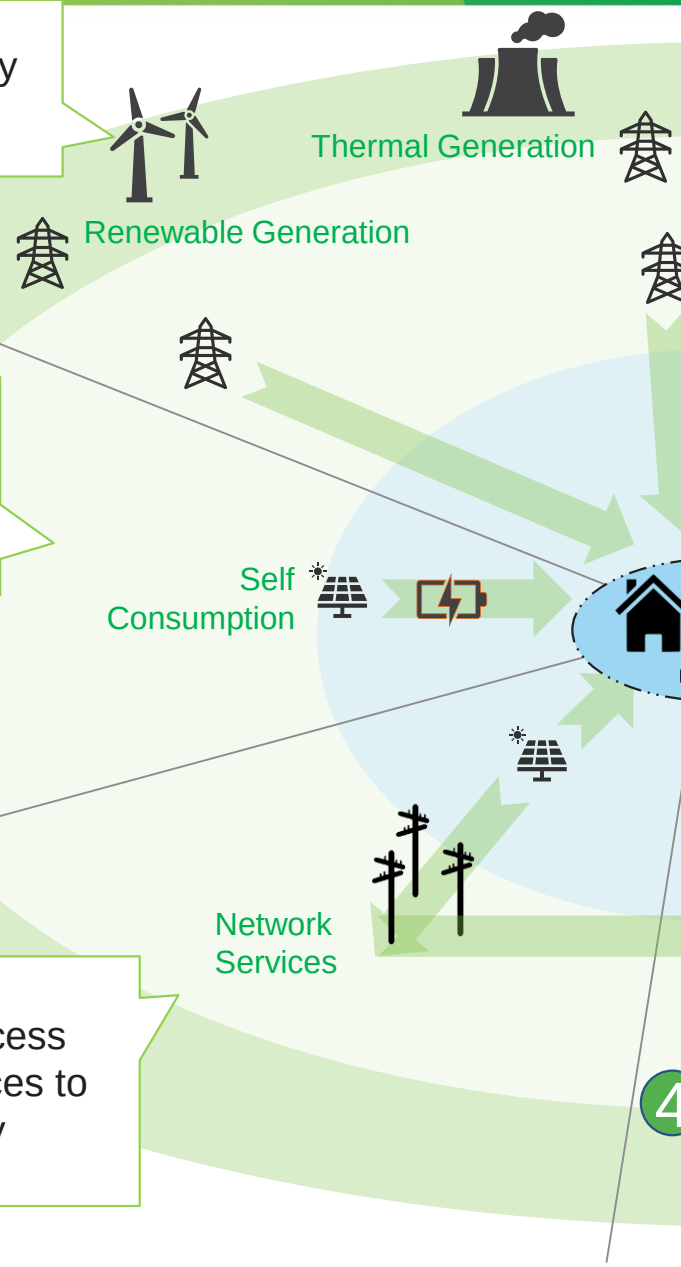


PROPOSED TRANSITION PATHWAYS FOR REFORMS - INTEGRATING DER AND FLEXIBLE DEMAND



THE CUSTOMER VIEW OF DER AND THE GRID

1 I can buy cheap energy from the grid



7 I can save money with smart hot water and thermostats to balance the grid

6 I can use my excess local energy to play in the markets

2 I can generate and store clean energy at my home

5 I can use my smart appliances to lower the risk of blackouts

3 I can sell my excess energy and services to others locally

4 I can generate and store clean and cheap energy in my community

People-oriented Perspectives on Designing the Future Energy Market

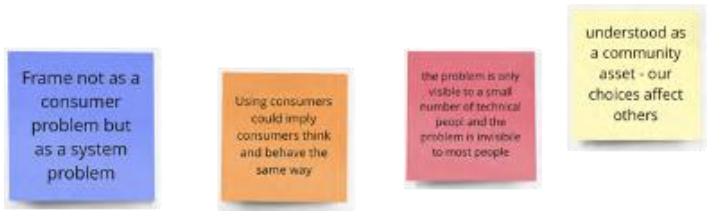
The *UTS Design Innovation Research Centre* (DIRC) has facilitated workshops at the request of *Energy Consumers Australia* (ECA) and consumer advocates.

A key aspect to the workshop was to try to imagine that people may behave differently in different contexts, that current habits and expectations may not be the ones that carry over unchanged into a very different kind of Energy System.

Design Principles

1. Acknowledging current motivations

2. People can and will change in the right circumstances
3. Participatory design
4. Public education
5. Learning not marketing
6. Careful naming and framing of problems and solutions



PROTECTIONS FOR CONSUMERS

With the transition to new products and services around solar and electric vehicles, multiple service providers, and smarter devices, how do ensure that all customers are protected, and that new risks are being managed?

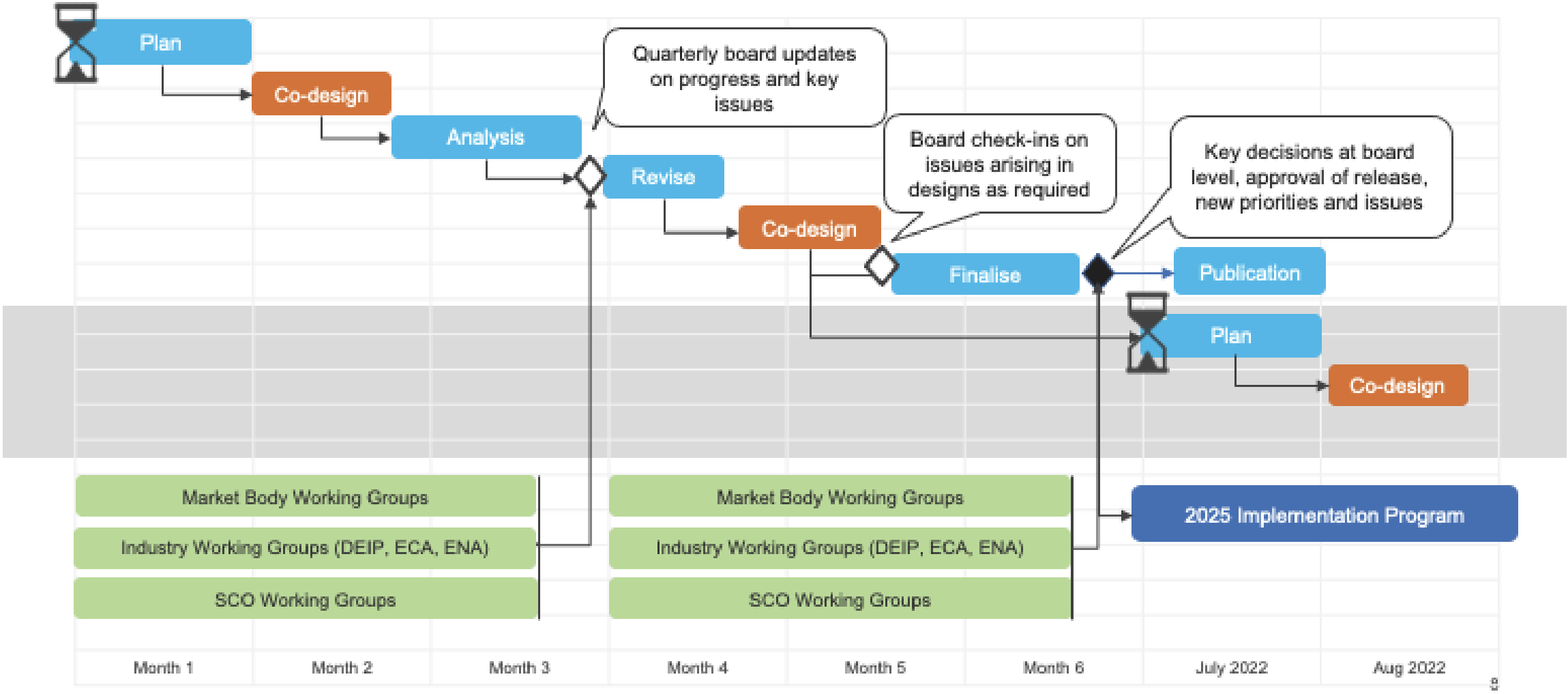
A proposed risk-oriented tool has been developed based around the *Energy Catapult Systems model (UK)* as put forward by the ECA.

The tool covers the following:

- Context setting and rationale
- Benefits and risk assessment evaluation
- Treatment of risks
- Monitoring and reviewing the treatment
- Communicating and consultation

The tool also highlights the principles that relate to each element of the framework, which can be used when applying it to a broad set of practical situations.

MATURITY PLAN PROCESS



NEXT STEPS

- We want to hear from you
    - Options Paper shortly out for consultation
    - Stakeholder briefings to be held next week

- ESB to prepare recommendations to Ministers in mid-2021