Acknowledgement of Country

We acknowledge that today we meet on many Aboriginal lands.

We acknowledge the traditional custodians of this land and pay our respects to Elders both past, present, and emerging through thoughtful and collaborative approaches to our work.

AEMO SERVICES

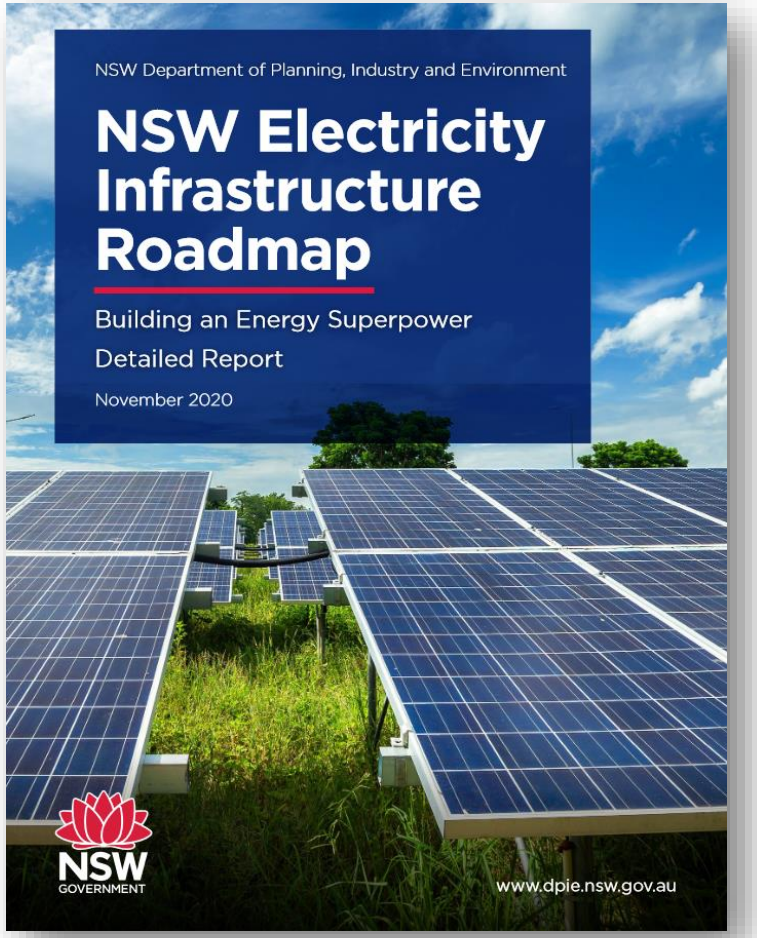
2021 Infrastructure Investment Objectives Report

December 2021

The Electricity Infrastructure Investment Act 2020

The EII Act

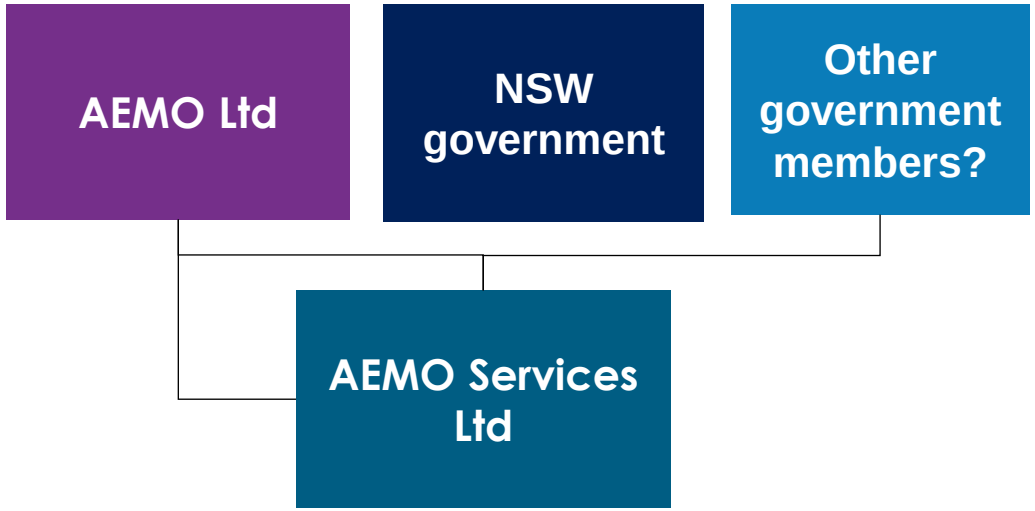
- The Electricity Infrastructure Investment Act 2020 is a bipartisan act that seeks to operationalise the NSW Government's Electricity Infrastructure Roadmap.
- The Roadmap is a long-term plan to transition NSW's energy grid from one dominated by centrally located thermal generation, to a decentralised grid dominated by variable generation and storage.
- The Roadmap aims to deliver a modern electricity system and maintain an affordable, reliable, clean and sustainable electricity supply in NSW



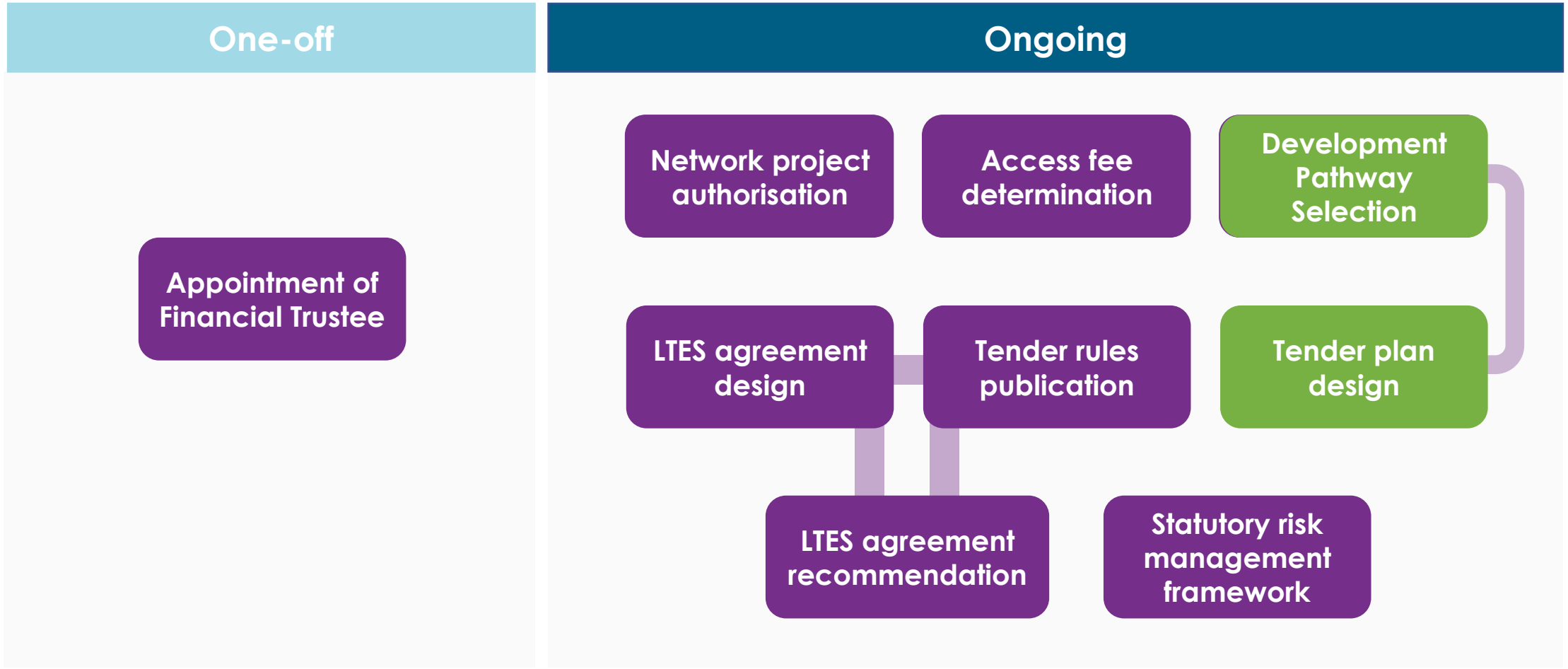
The NSW Consumer Trustee

AEMO Services as the NSW Consumer Trustee

- AEMO Services is a newly created subsidiary of AEMO.
- Balances independence with expertise
  - Separate board, constitution, staff and funding arrangements
  - Ability to leverage AEMO market and industry knowledge, and corporate service functions
- Membership open to all Australian jurisdictions



Role of the Consumer Trustee

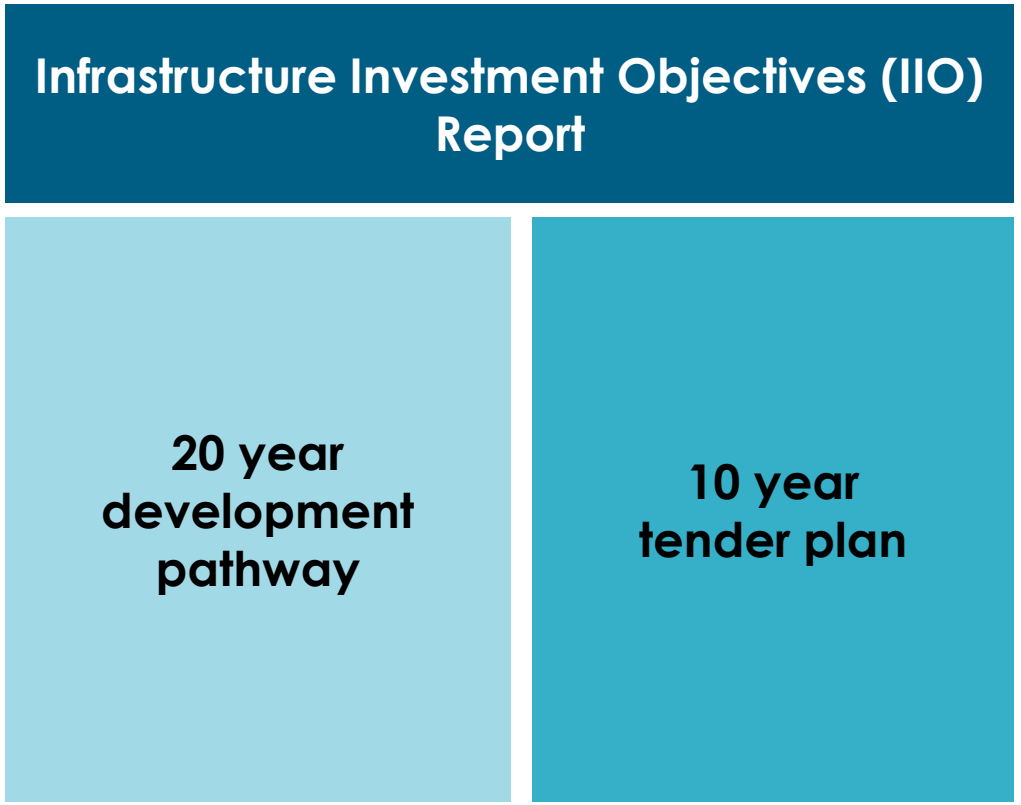


The IIO Report

Electricity Infrastructure Investment Safeguard

- **Part 6 - Section 45 of the EII 2020 Act**

- The consumer trustee is to prepare a report about the Infrastructure Investment Objectives that contains:
  - The Development Pathway for the infrastructure to which this Part applies that is required to be constructed over the following 20 years to achieve the infrastructure investment objectives
  - A plan for the competitive tenders that the consumer trustee will conduct during the following 10 years to give effect to the Development Pathway, including when tenders will be conducted and the classes of LTES agreements for which a tender will be conducted



The infrastructure investment objectives

Infrastructure Investment Objectives

Infrastructure type	Definition	Minimum objective (volume/ capacity target)	Overall Objectives: Minimise electricity prices	Overall Objectives: Meet reliability standard	Overall Objectives: Meet the energy security target
Generation	Generation from a renewable energy source ≥ 30 MW	At least the same amount as 12 GW (~33.6 TWh p.a) constructed by the end of 2029	✓	N/A	N/A
LDS	Storage able to be dispatched at registered capacity for ≥ 8 hrs, and scheduled by AEMO in the central dispatch process under NER	2 GW constructed by the end of 2029	N/A	✓	N/A
Firming	Firm capacity scheduled by AEMO in the central dispatch process under the NER	None	N/A	✓	✓

ISP vs IIO

	ISP	IIO
Purpose	Provide a roadmap for the efficient development of the National Electricity Market (NEM)	Provide a roadmap for the construction of generation, LDS and firming infrastructure in NSW over the next 20 years Set out the 10 year plan for conducting of LTES agreement competitive tenders
Frequency	Every two years	Every two years (potential option for interim report next year)
Optimisation objective	Minimise system costs (while meeting reserve requirements and reliability standard)	Minimise cost to NSW Consumers (while meeting other IIOs)
Responsibility	AEMO	AEMO Services (as the NSW Consumer Trustee)
Forecast period	20 years	20 years
Consultation requirements	Set out in NER	To be set out in regulation (currently none)

Selecting the 2021 Development Pathway

Modelled pathways

2021 Development Pathway

Late

Delays the construction of generation, long-duration storage as late as practical while still achieving the IIOs

REZ Aligned

Aligns the construction of generation infrasttructre with the construction of REZ network infrastructure

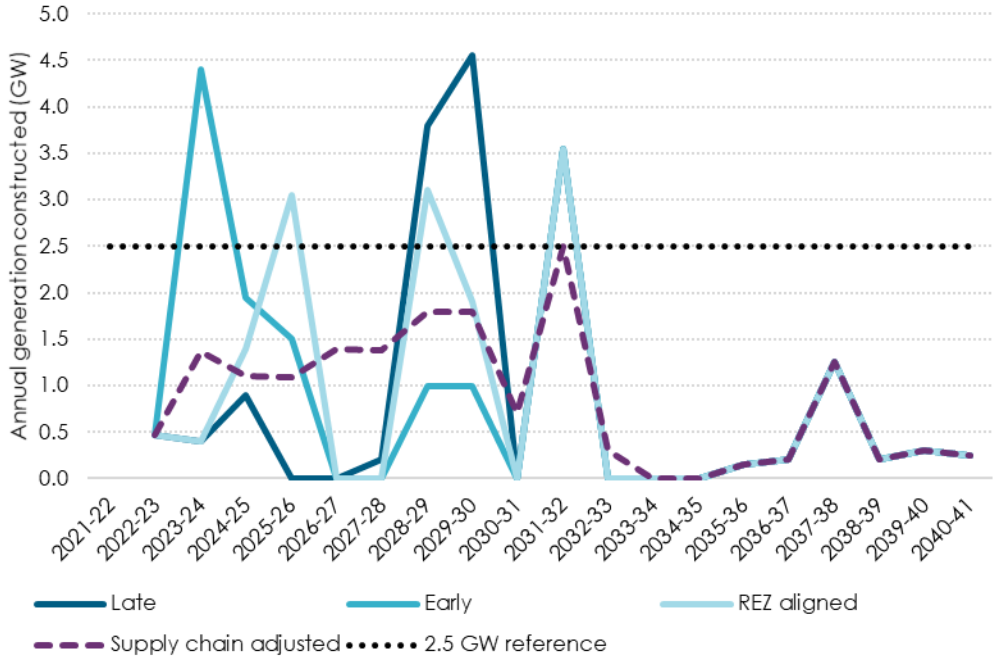
Early

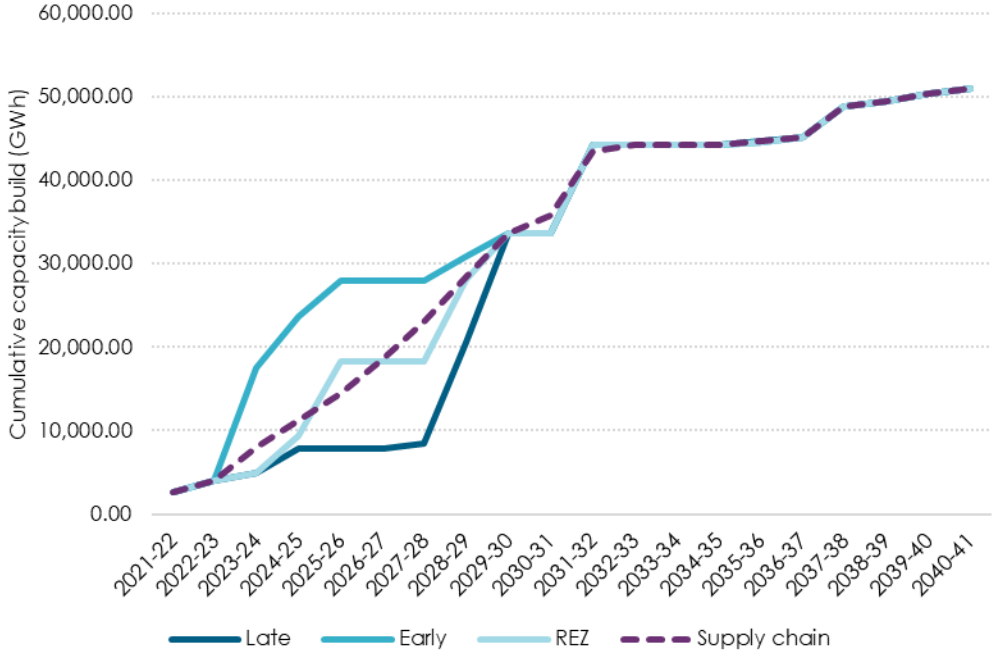
Brings forward the construction of generation infrastructure as early as practical

Supply Chain Adjusted

As per REZ Aligned but inlcudes a maximum and minimum annual build limit to reduce the risk of supply chain constraints

Development pathway comparisons



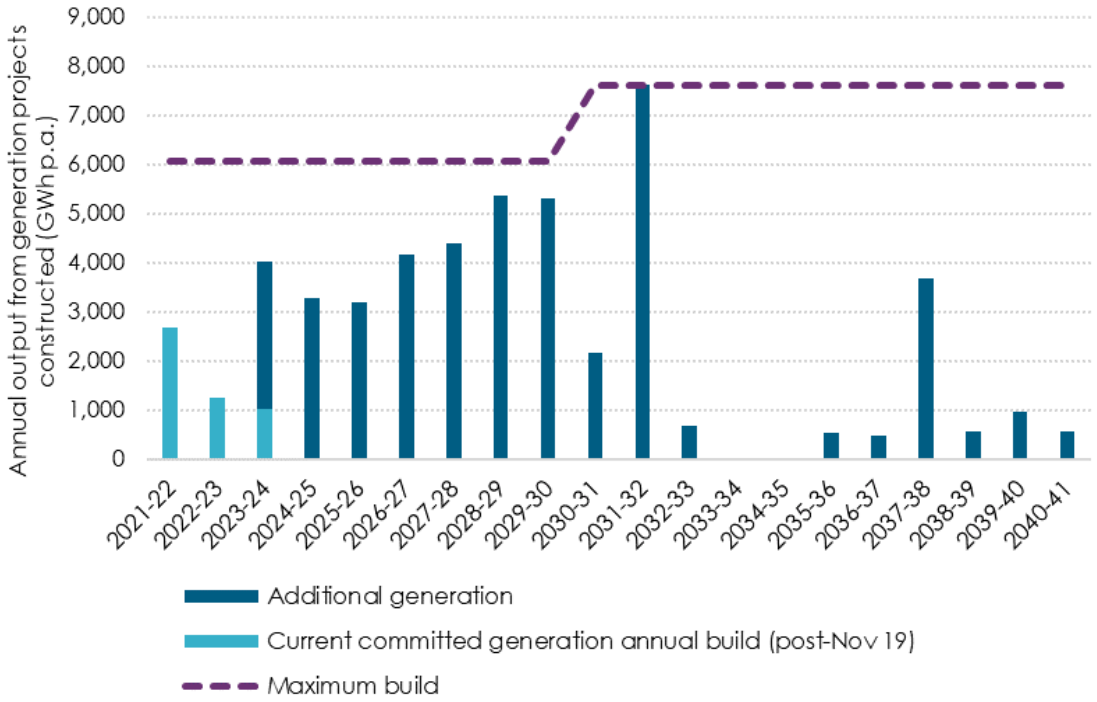


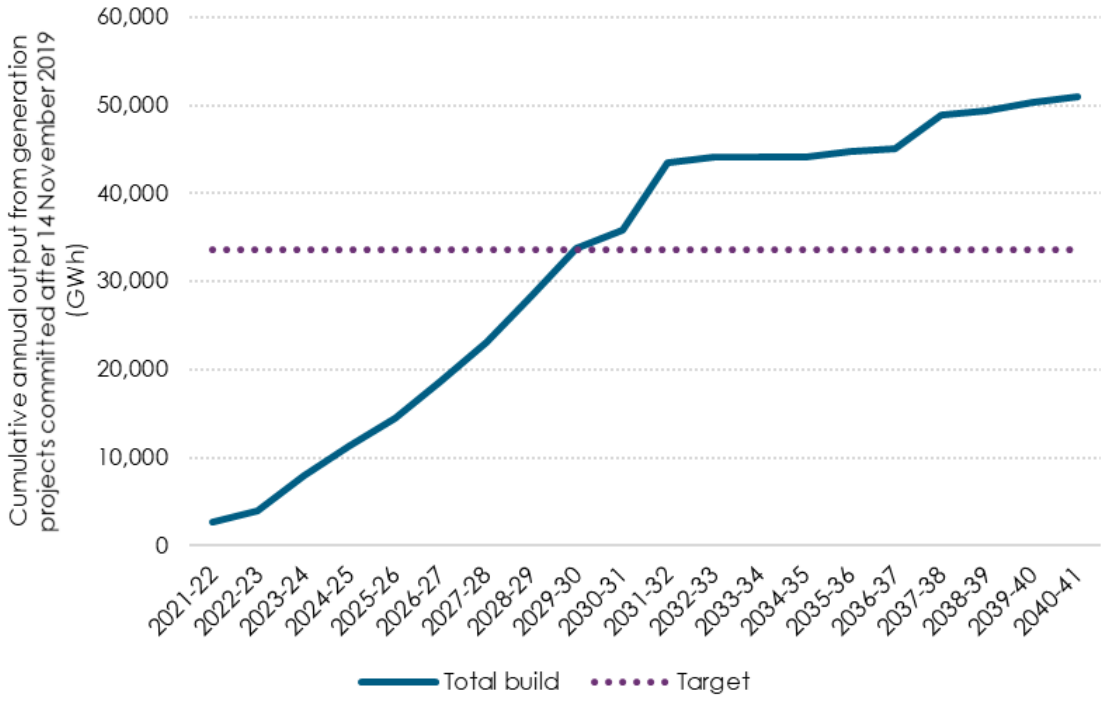
Assessment against criteria

Criteria	Late	REZ aligned	Early	Supply Chain adjusted
Minimises costs to supply wholesale energy services to NSW consumers (NPV $b)	$35.8	$36.9	$36.6	$36.1
Improves sustainability (reduces cumulative carbon emissions relative to Late)	-	-22.8MtCO2e (-7%)	-44.2MtCO2e (-13%)	-25.7MtCO2e (-8%)
Maintains reliability (smallest annual margin between state-wide EST and firm capacity across 20 years)	2.9%	2.9%	2.5%	2.9%
Promotes resilience	Delayed schedule provides least flexibility and is the most inherently vulnerable to uncertainties	Coordinated build schedule aligns with other REZ developments and allows for advance or delay against plan in response to uncertainty	Advanced schedule is vulnerable to misalignment with other developments including transmission augmentation	Adjusted schedule offers the most resilience as it provides the greatest optionality to respond to uncertainties
Enhances competition throughout the tender process	Late peak provides minimal learning opportunities for both CT and participants	Peaks in build reduce opportunity for participants to refine bids over time	Peaks in build reduce opportunity for participants to refine bids over time	Frequent low volume tenders leads to better consumer value bids over time
Minimises supply chain constraints	Supply chain risks exist compounded if network augmentation also delayed	Supply chain risks exist based on generation build peaks	Supply chain risks exist based on generation and network build peaks	Lowest risk of supply chain risk across the available pathways

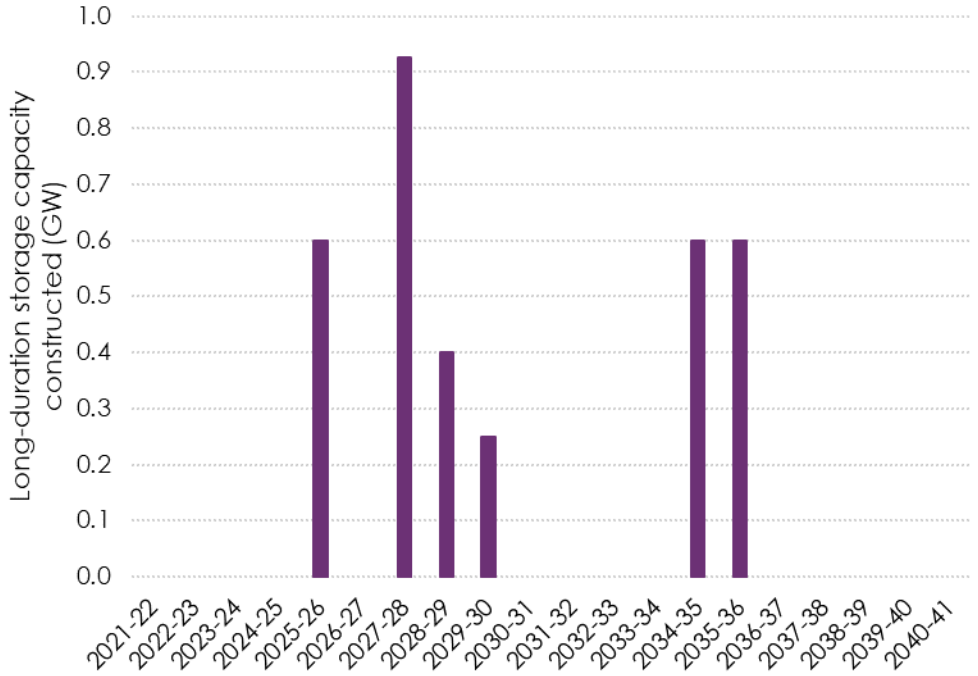
Development Pathway

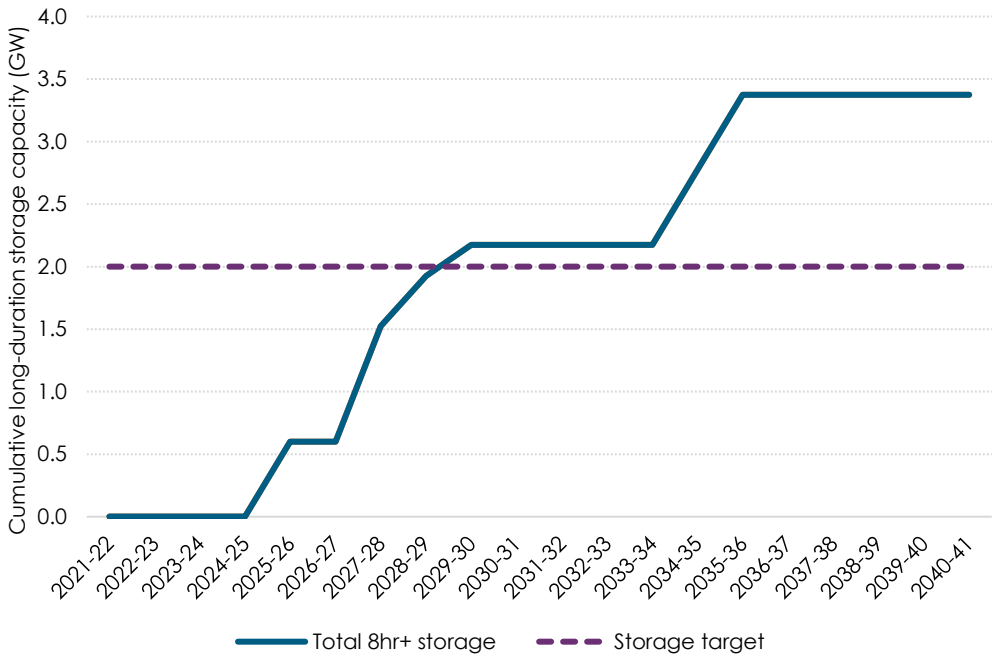
Generation


Annual output from generation projects constructed (GWh p.a.)
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
2021-22
2022-23
2023-24
2024-25
2025-26
2026-27
2027-28
2028-29
2029-30
2030-31
2031-32
2032-33
2033-34
2034-35
2035-36
2036-37
2037-38
2038-39
2039-40
2040-41
Additional generation
Current committed generation annual build (post-Nov 19)
Maximum build


Cumulative annual output from generation projects committed after 14 November 2019 (GWh)
60,000
50,000
40,000
30,000
20,000
10,000
0
2021-22
2022-23
2023-24
2024-25
2025-26
2026-27
2027-28
2028-29
2029-30
2030-31
2031-32
2032-33
2033-34
2034-35
2035-36
2036-37
2037-38
2038-39
2039-40
2040-41
Total build
Target

Long duration storage

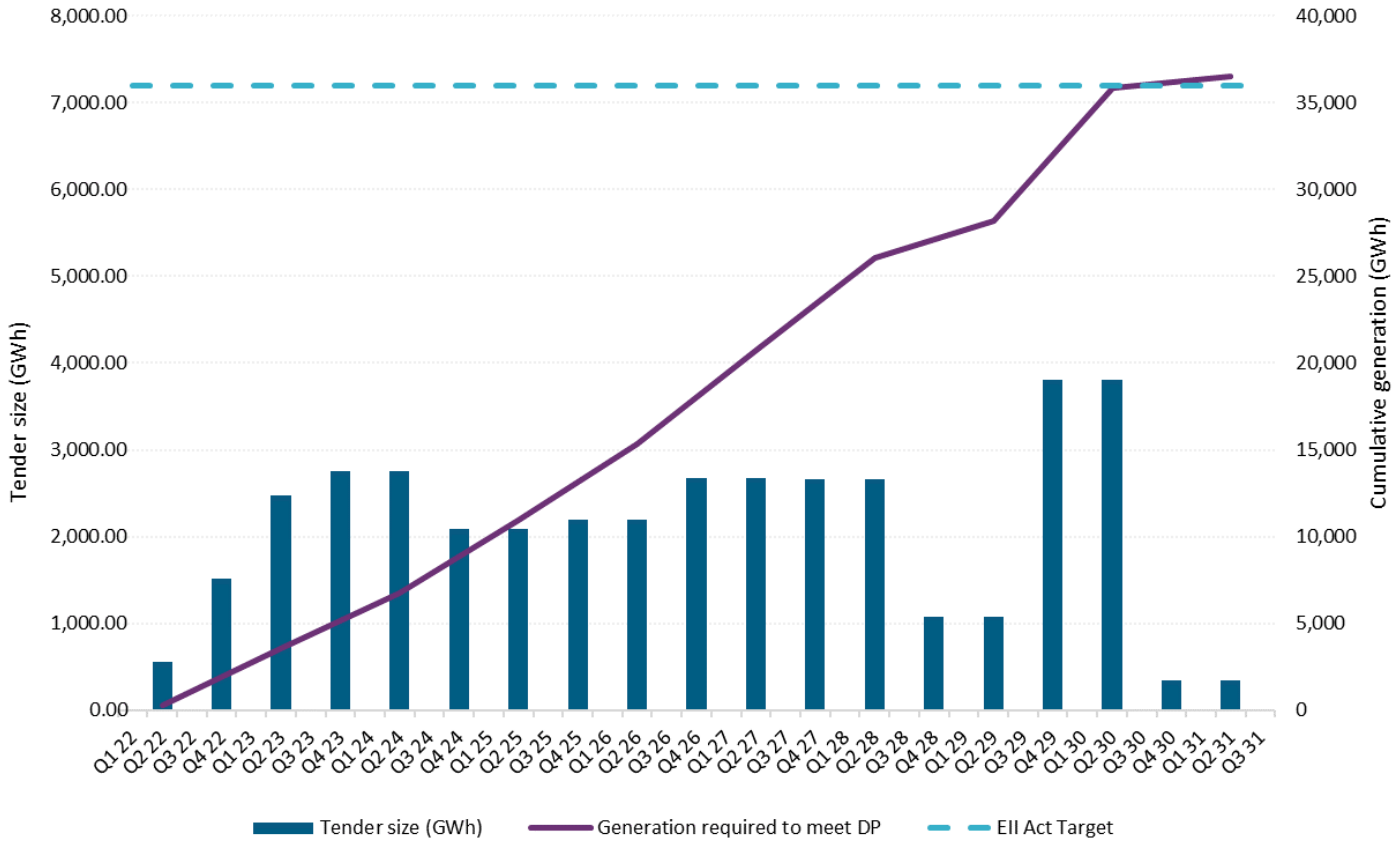




Ten Year Plan

Generation

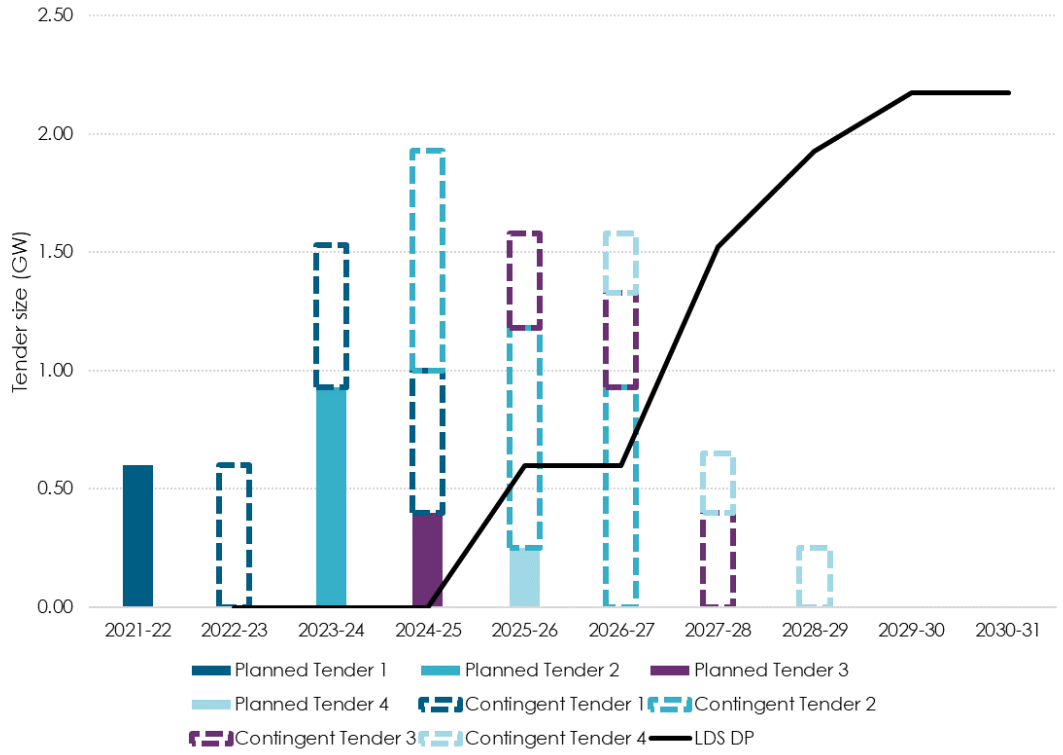
- First “pilot” tender is set at 0.2GW/~552GWh
- Second tender is set at 0.5GW/~1,521GWh
- Most competitive tenders anticipated to be across 3rd to 5th tender when all information for all REZ’s likely to be available



Long duration storage

3 potential outcomes from planned tenders:

1. Projects submit with anticipated lead teams at anticipated costs → Proceed as planned
2. PHES projects not eligible and other technology too higher cost → Do not recommend any LTESAs and conduct contingent tender(s)
3. Other technologies very cost competitive → Recommend other technologies and move ahead of DP



Next steps

Next steps

- Feedback to iioreport@aemoservices.com.au (by 31 January 2022)
- Follow-up Q&A webinar on 15th December (invites to be sent today)
- Online interactive session on tender design (for potential participants) in early February 2022
- Tender rules to be made by the NSW CT in early 2022

Panel Session: Q&A