2024 Integrated System Plan (ISP) Webinar

2 July 2024

This webinar will be recorded and published online

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

We pay respect to Elders past and present.

Agenda

- Welcome
- Introduction
- **Overview** – *The ISP is a roadmap for the energy transition*
- **The Plan** – *AEMO's integrated modelling seeks the optimal development path*
- Q&A

How to interact today

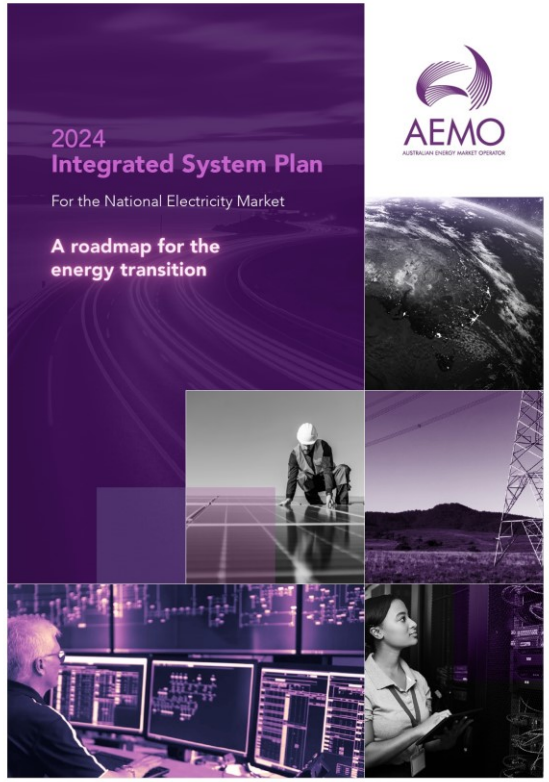
www.sli.do
#AEMO

- Ask questions using Slido www.sli.do #AEMO
- Written replies may be provided through Slido if appropriate
- AEMO will not provide responses to unanswered questions

Today's objectives

Present and discuss key insights from the *2024 Integrated System Plan* (ISP).

After the presentation, you will have the opportunity to ask AEMO questions, using Slido.



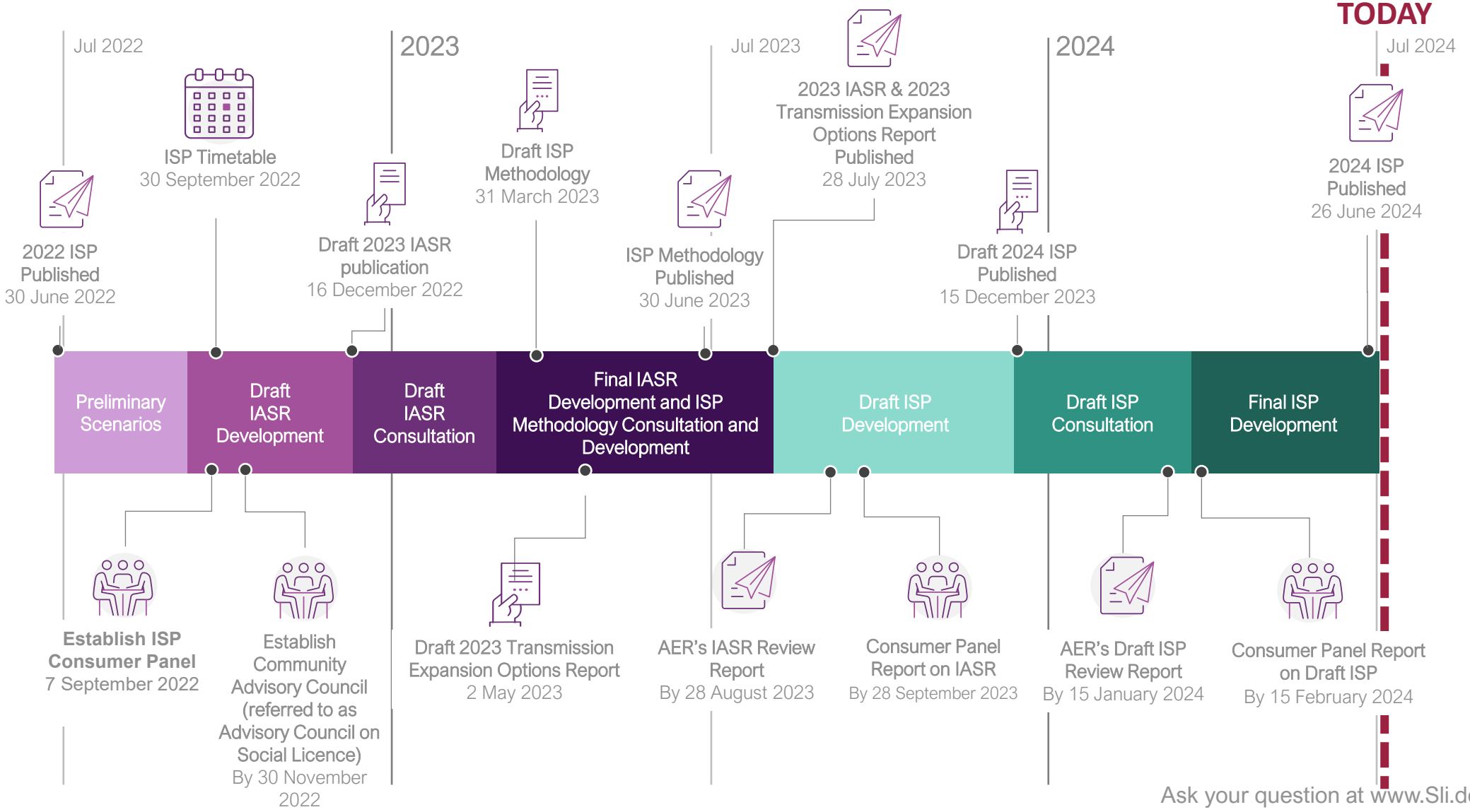
Read the report and supporting material

The ISP is a roadmap for the energy transition

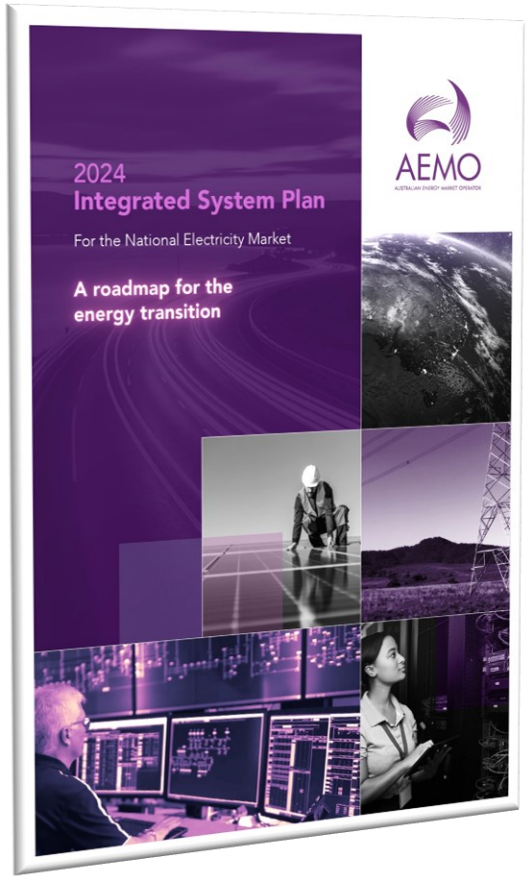
Merryn York

Executive General Manager, System Design

AEMO publishes the 2024 ISP after two years of planning and engagement

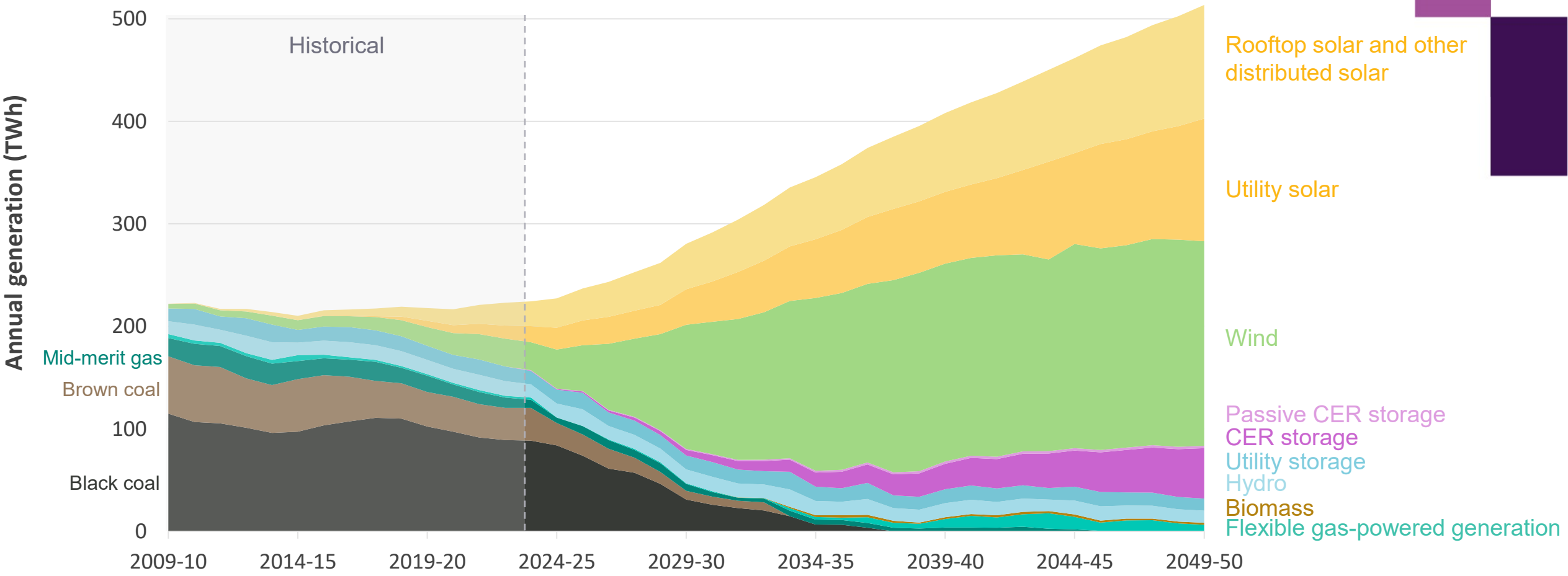


The Integrated System Plan is a roadmap for the energy transition



- A roadmap for the National Electricity Market (NEM) energy transition.
- Optimal development path for reaching net zero by 2050.
- Least-cost path for transition within Commonwealth and State policies.
- Provides expert information for a range of stakeholders.
- Serves regulatory purpose of identifying ‘actionable’ projects which should progress as urgently as possible.

The transition is well underway, with electricity generation shifting to low emissions and renewable energy



Renewable energy *connected with* ***transmission and distribution****, firmed with* ***storage*** *and backed up by* ***gas-powered generation*** *is the lowest cost way to supply electricity to homes and businesses as Australia transitions to a net-zero economy.*

AEMO's integrated modelling seeks the optimal development path

Samantha Lloyd, Lead – Stakeholder Engagement
Samantha Christie, Manager, Strategic Planning
Andrew Turley, Group Manager, Forecasting

Stakeholder engagement for the ISP is a two-year, inclusive process

Consultation

AEMO's 2024 ISP takes into account feedback from a wide range of different groups and sources, including workshops, webinars, public forums, other engagements and submissions.

2,100 stakeholders engaged

12 webinars hosted

85 presentations and reports

220 written submissions

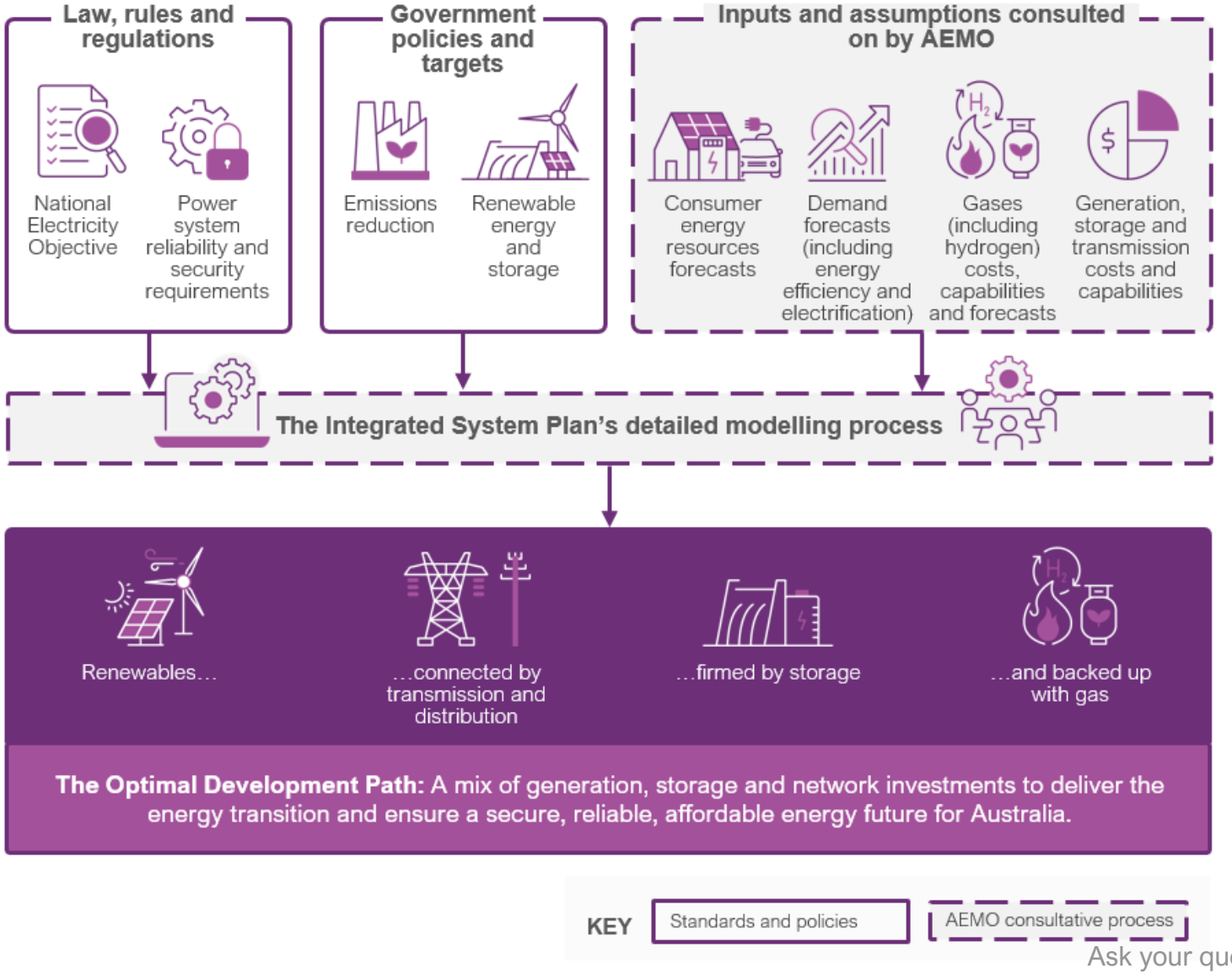
Key feedback themes

- Concerns over gas-powered generation expansion
- Delivery risks to the optimal development path may compound
- Further analysis is required on potentially actionable projects
- Suggested improvements to the ISP modelling approach
- More work is needed to integrate consumer energy resources
- Adjustment to the demand forecast could be included
- Social licence for the energy transition requires broad consultation
- What is the role of the Integrated System Plan?
- Additional suggestions for generation and storage technologies
- Hydrogen assumptions could be explored further
- 2026 ISP scope to expand as the energy transition continues

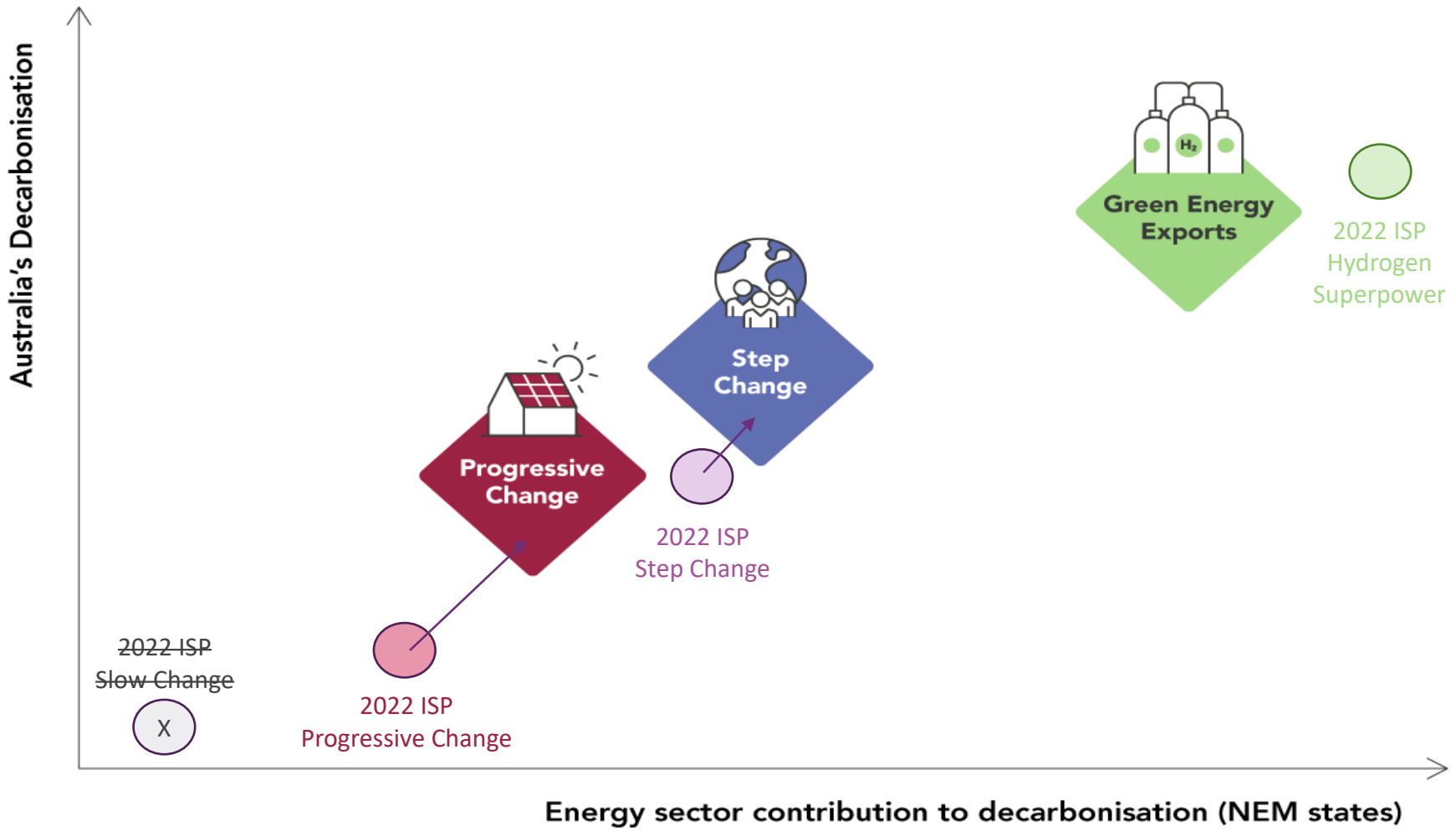
Final ISP model includes the latest inputs and responses to stakeholder feedback

- Value of emissions reductions
- Latest generation and storage project statuses
- Updated gas infrastructure consideration
- Updated policies
- Updated transmission options
- New and updated sensitivity analysis

The ISP takes standards, policies and consulted-on inputs and assumptions to model the optimal development path



Three scenarios explore the pace of change to reach net zero by 2050, with *Step Change* being most likely



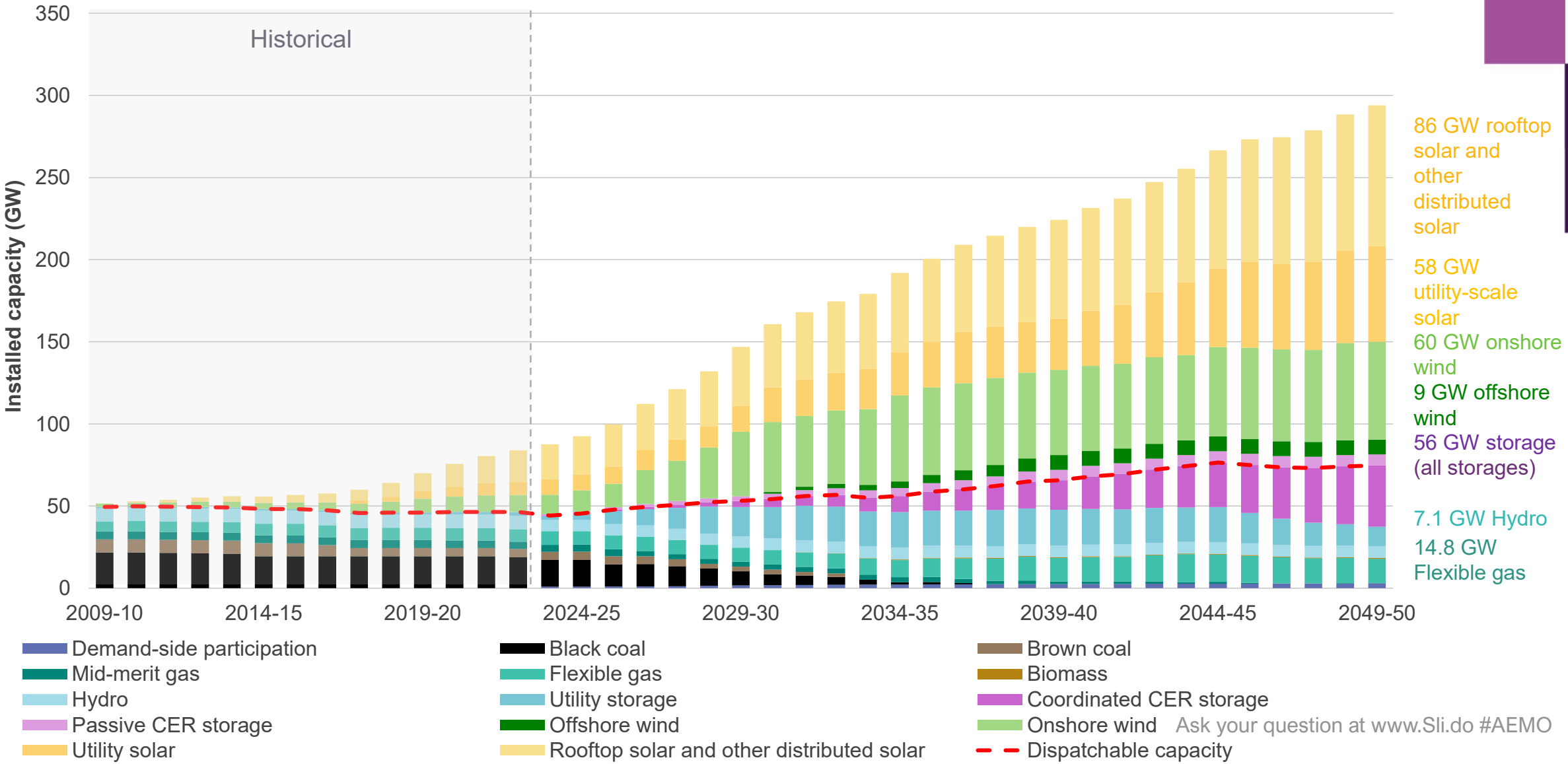
Considering insights from the Delphi Panel, AEMO has assigned likelihoods of 43% for Step Change, *42% for* Progressive Change *and 15% for* Green Energy Exports.

All scenarios target net zero by 2050 and include committed energy policies

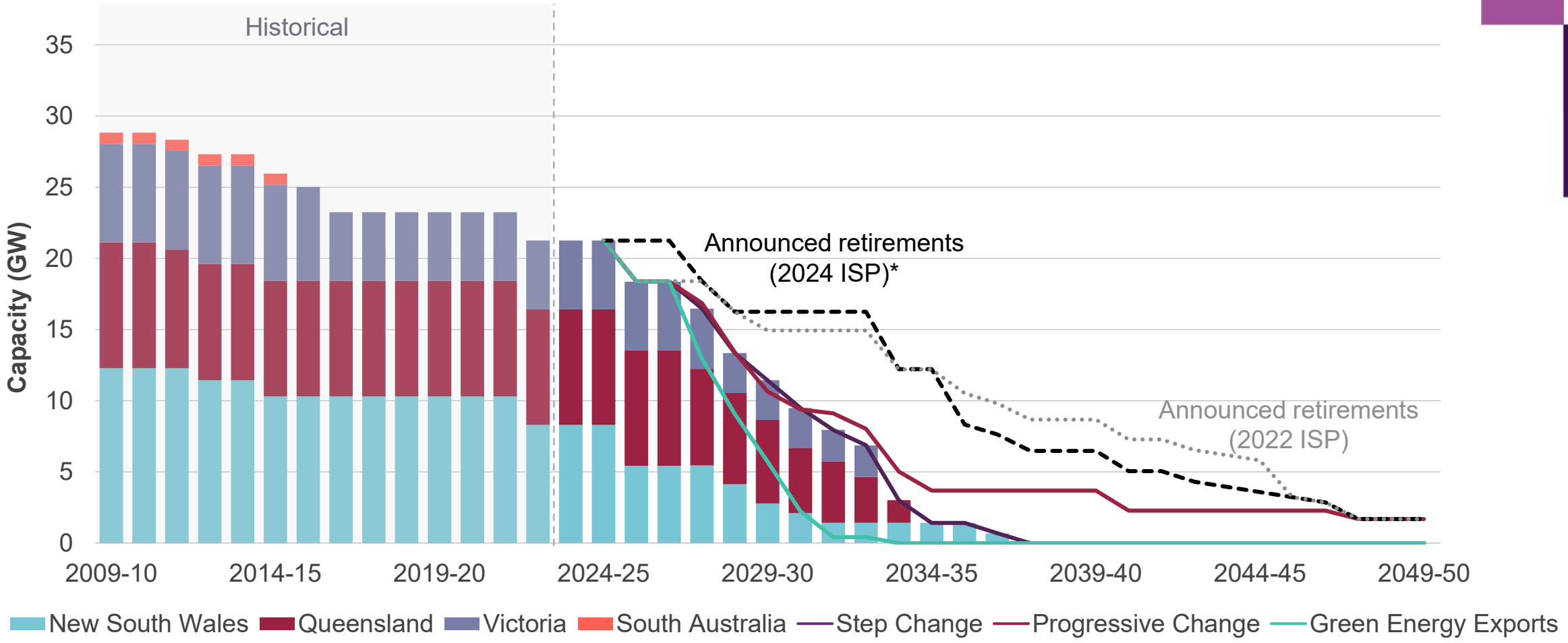
- **Commonwealth:** Powering Australia Plan's 82% renewable energy by 2030, 43% emission reduction by 2030, Safeguard Mechanism, and the expanded Capacity Investment Scheme target (32 GW by 2030).
- **Queensland**: Latest QRET targets, Borumba Pumped Hydro, CopperString 2032, 75% emissions reduction by 2035, and transmission options from the Queensland Energy & Jobs Plan.
- **New South Wales**: 50% emissions reduction by 2030 and 70% by 2035, Electricity Roadmap targets for renewable capacity and deep storage.
- **South Australia**: Hydrogen Jobs Plan, including 250 MW electrolyser and 200 MW hydrogen capable generator.
- **Victoria**: Latest VRET and emission reduction targets, storage, and offshore wind targets.
- **Tasmania:** TRET and Battery of the Nation options.
- **All jurisdictions:** Value of greenhouse gas emissions reduction.

Renewable energy *connected with transmission and distribution, firmed with storage and backed up by gas-powered generation is the lowest cost way to supply electricity to homes and businesses as Australia transitions to a net-zero economy.*

Six times today's utility-scale wind and solar, and five times today's consumer energy resources, by 2050



Coal is retiring, faster than announced



**The delay of Eraring retirement is reflected in the 'announced retirements' trend in this chart, and in sensitivity analysis, but is not included in the core modelling for the 2024 ISP.*

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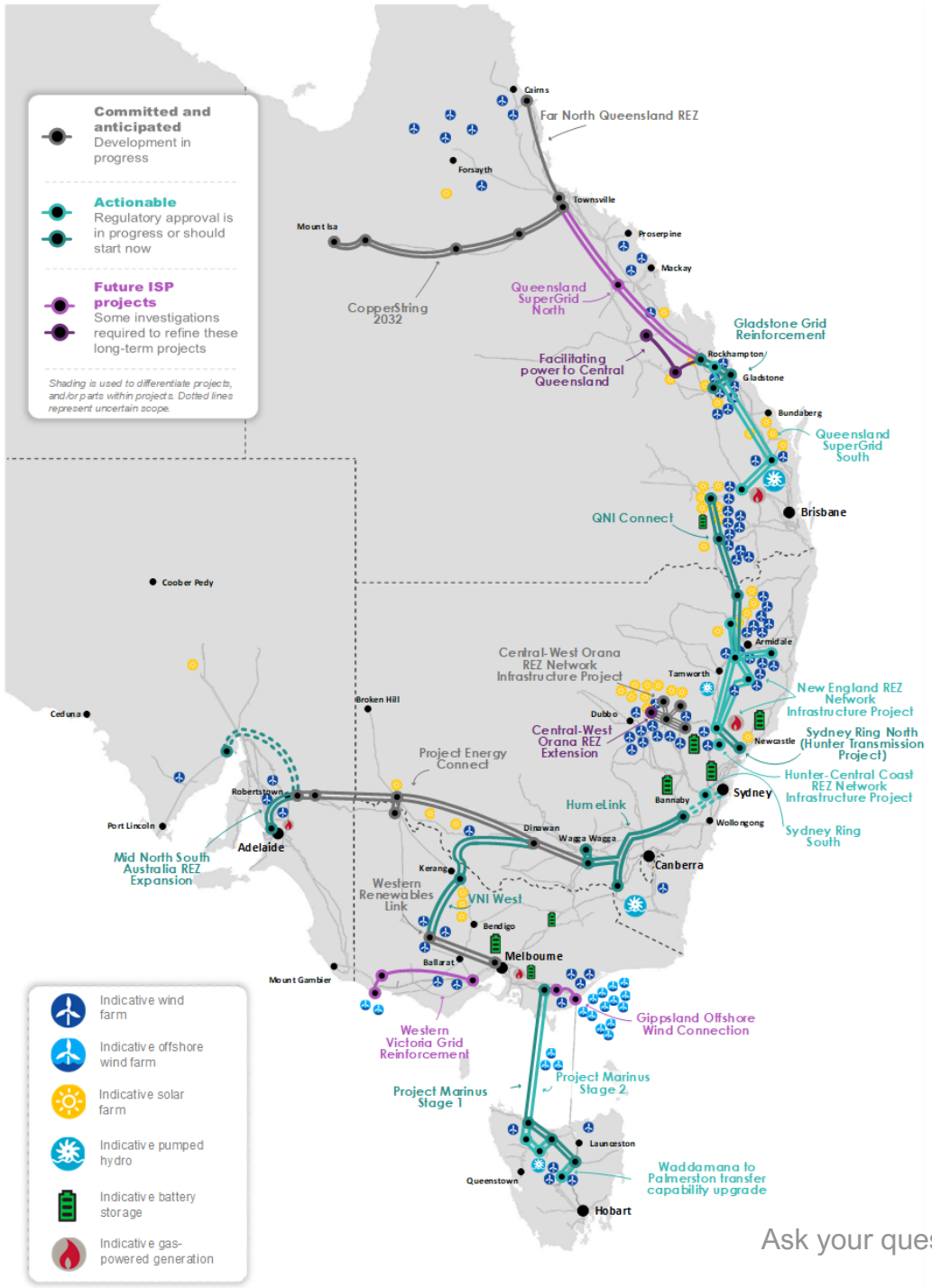
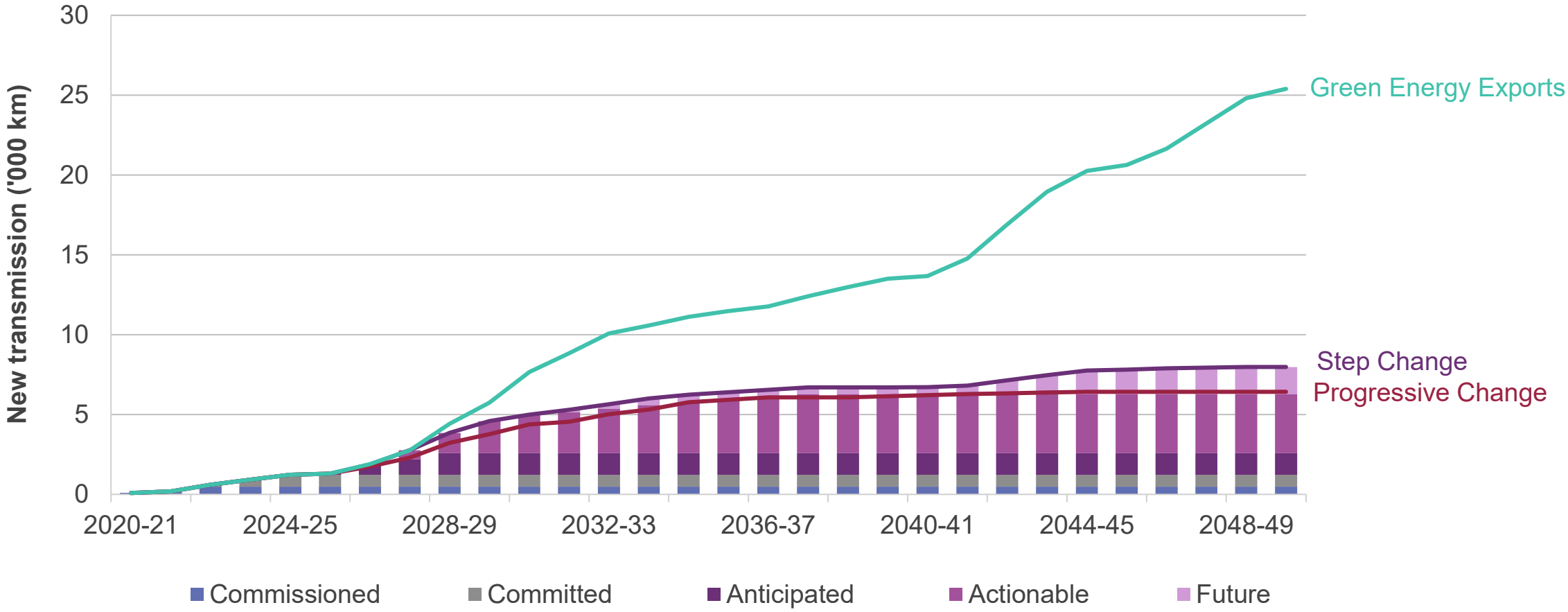
Twelve transmission projects are actionable in the 2024 ISP optimal development path

- Actionable and future ISP projects are selected to meet power system needs and optimise market benefits to the NEM.
- Five projects progressed to actionable between the draft and final ISP, reflecting:
  - Identification of smaller augmentation options.
  - Close joint planning between AEMO and project proponents.
  - Earlier start dates to allow for more coordinated and effective community consultation.

This map shows indicative new generation and storage in 2040, and transmission projects that include new transmission lines, increase capacity by 500 MW or more, and are required in all scenarios by 2050.



Around 5,000 km of transmission investment identified as needed over the next decade, half of which is underway



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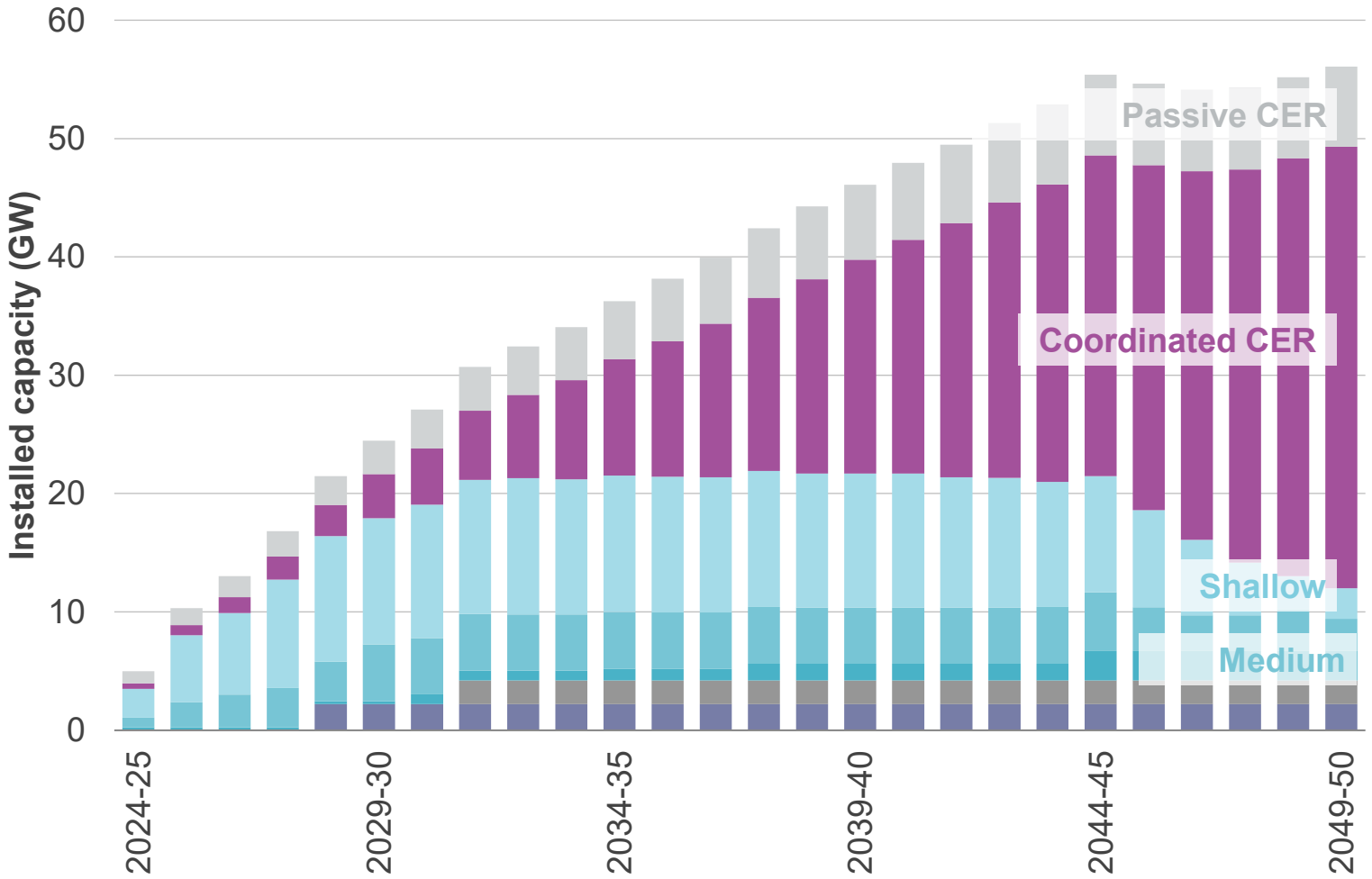
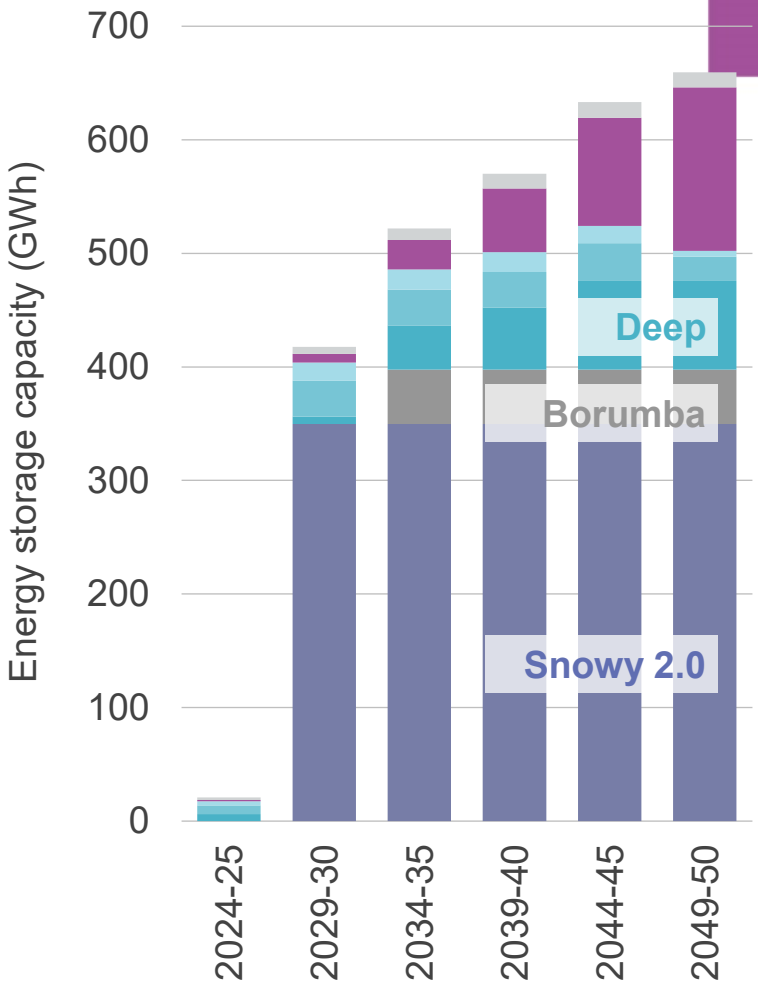
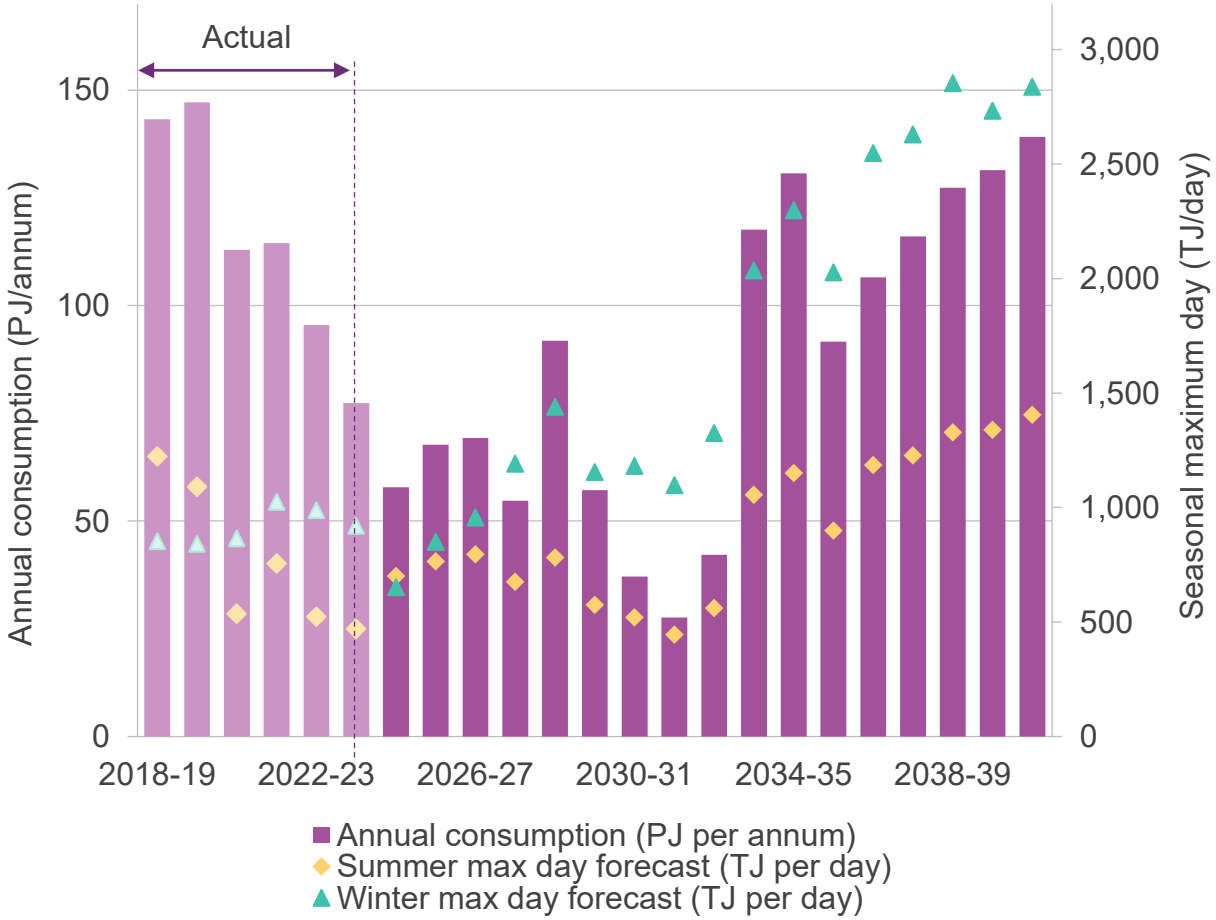
Different forms of storage are needed, including for intra-day shifting, seasonal shifting and renewable droughts



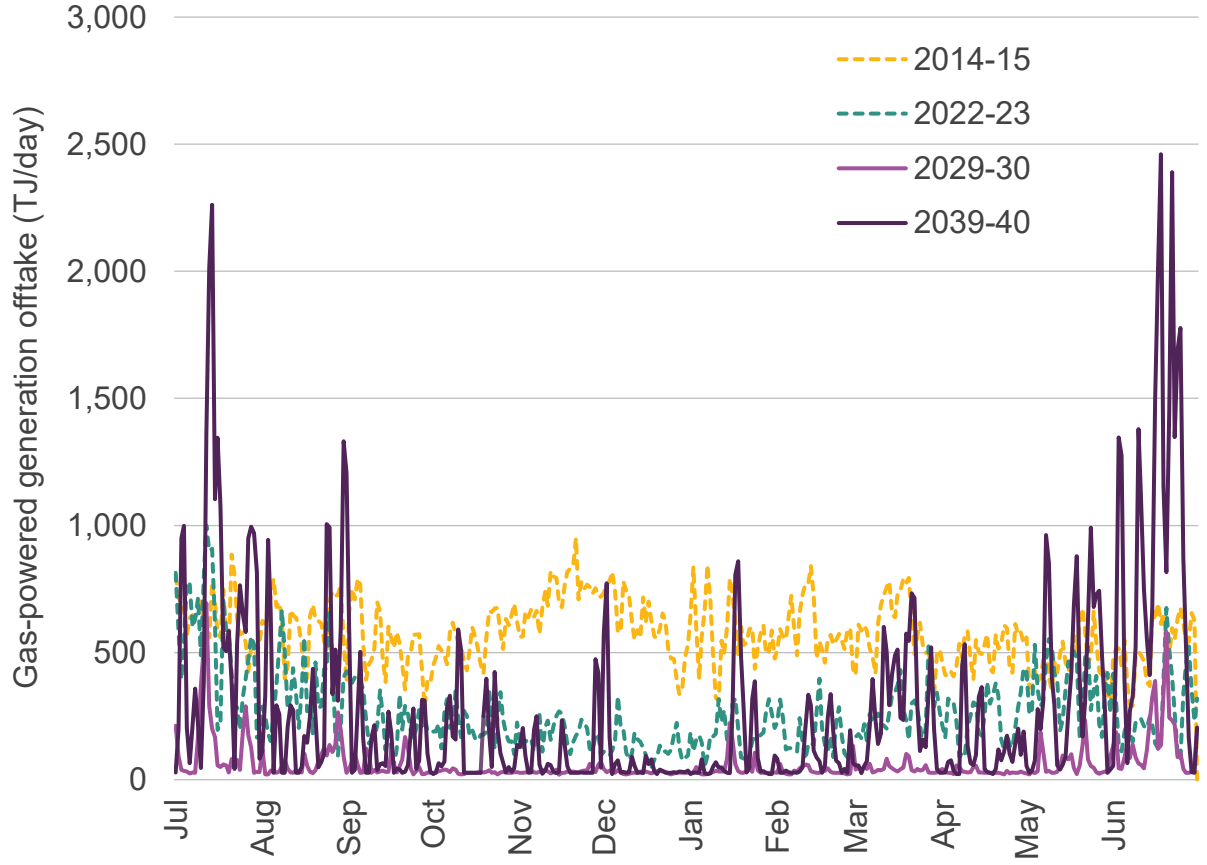


More gas-powered generation capacity is required but will operate less frequently

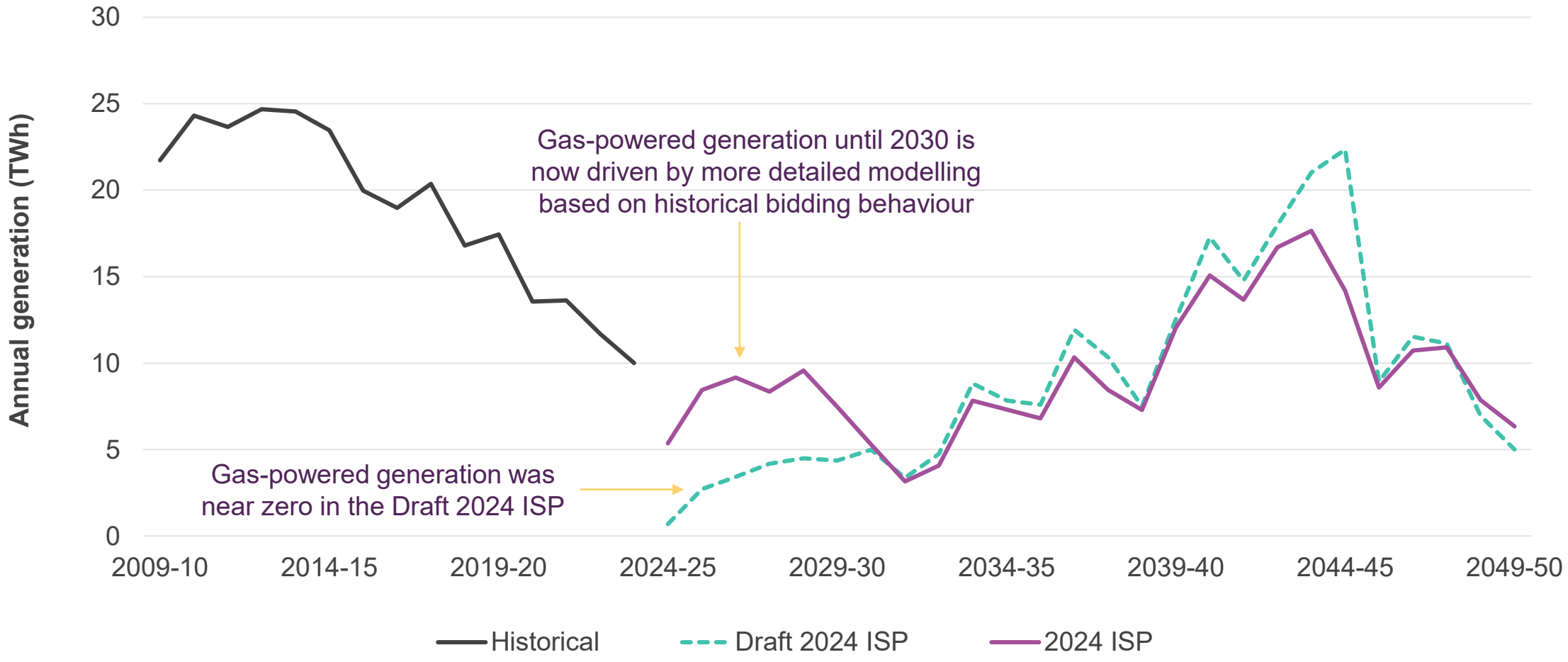
Actual and forecast NEM gas-powered generation annual consumption (PJ/y) and seasonal maximum daily demand (TJ/d) in *Step Change*, 2019-40



Forecast daily NEM gas-powered generation offtake in 2029-30, and 2039-40, *Step Change*, (TJ/d)

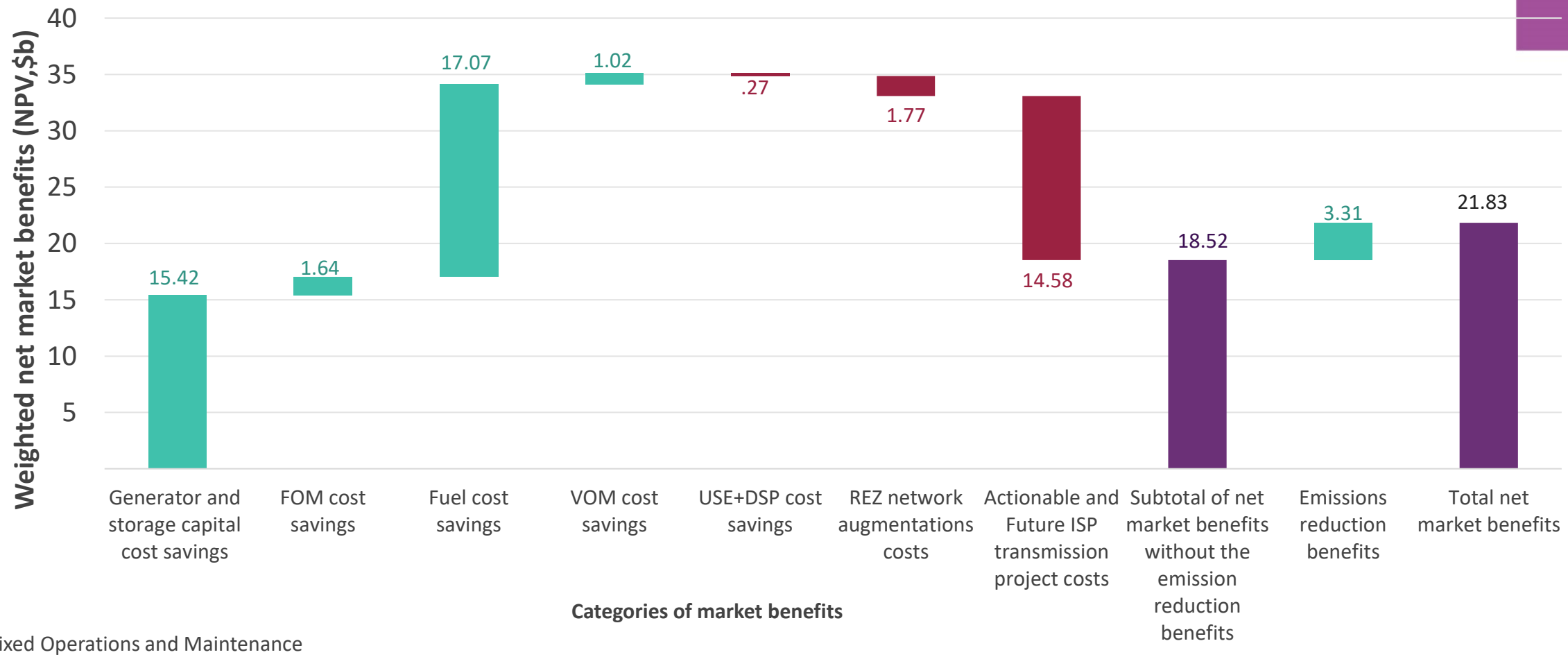


The ISP includes NEM-wide improved modelling of gas-powered generation over the immediate future



*Renewable energy connected with transmission and distribution, firmed with storage and backed up by gas-powered generation is the **lowest cost way to supply electricity** to homes and businesses as Australia transitions to a net-zero economy.*

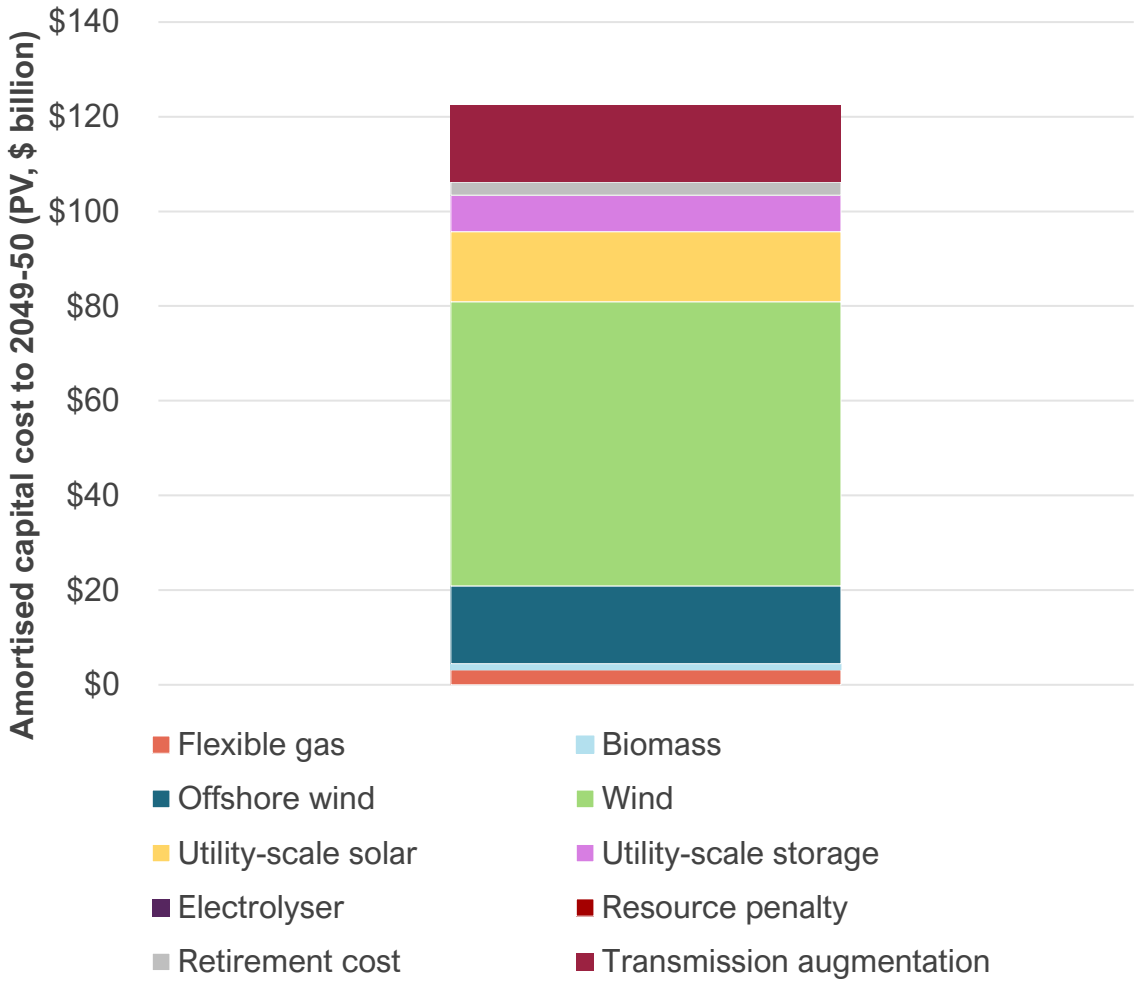
The ISP optimal development path saves consumers $18.5 billion and delivers emissions reductions valued at $3.3 billion



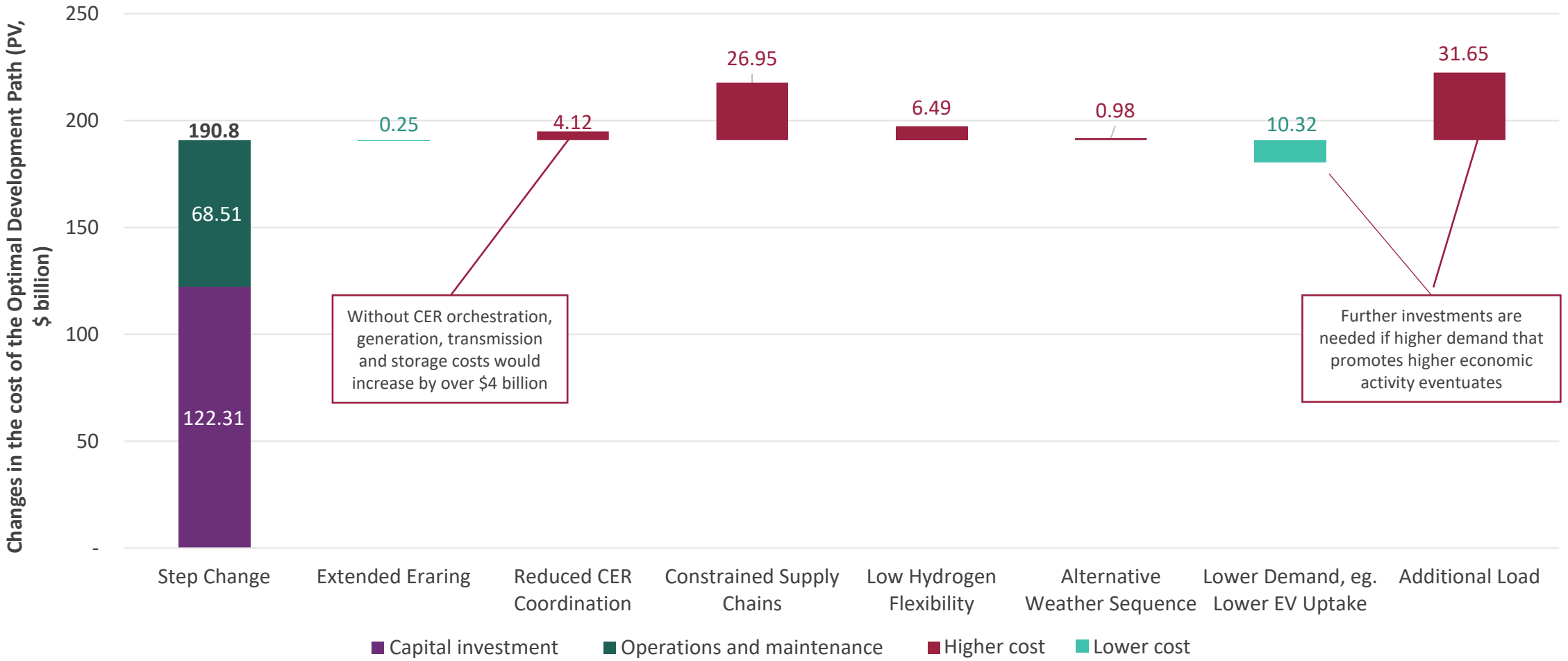
FOM: Fixed Operations and Maintenance
VOM: Variable Operations and Maintenance
USE: Unserved energy
DSP: Demand side participation
REZ: Renewable Energy Zone

Capital investment needed for essential electricity infrastructure

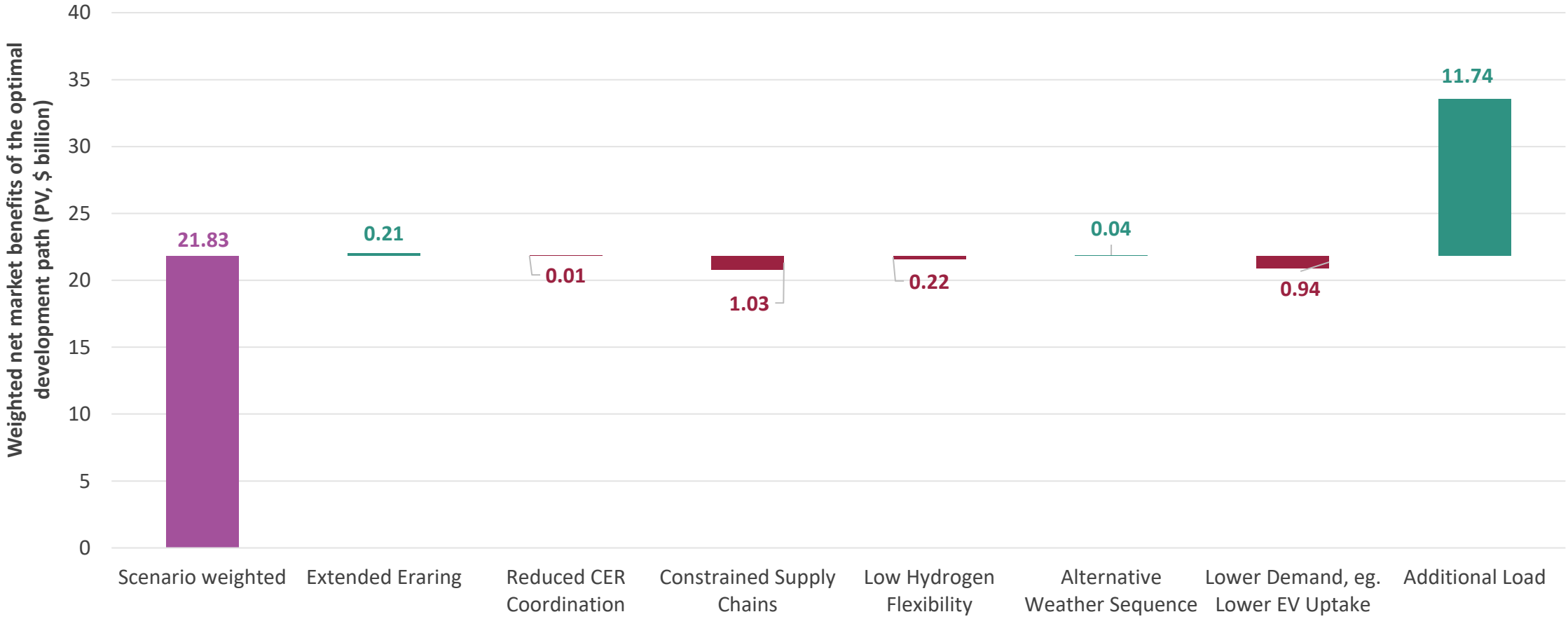
- The ISP's optimal development path has an annualised capital cost of $122 billion to 2050.
  - Includes grid-scale generation, storage and transmission.
  - Does not include emissions reduction benefits.
  - Excludes the cost of commissioned, committed and anticipated projects, as well as consumer energy resources costs, and distribution network upgrades.



Investment and operating costs will vary depending on consumer needs…



… however the benefits of the investments in the optimal development path are broadly resilient to those uncertainties.



Questions and discussion

Ask your question at www.Sli.do #AEMO

Next steps

Share your feedback in the 2024 ISP Engagement Satisfaction Survey by 17 July 2024.

The recording and presentation will be published on the 2024 ISP engagement webpage.

Get involved in the 2026 ISP process, subscribe to the ISP mailing list.

Consultation will start on ISP Methodology & 2025 IASR.

AEMO

AUSTRALIAN ENERGY MARKET OPERATOR

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