This event will be recorded and the recording published on AEMO's website

Draft 2025 Inputs, Assumptions and Scenarios Report (IASR)

Stage 2 Publication webinar

18 March 2025

We acknowledge the Traditional Custodians of the land, seas and waters across Australia. We honour the wisdom of Aboriginal and Torres Strait Islander Elders past and present and embrace future generations.

We acknowledge that, wherever we work, we do so on Aboriginal and Torres Strait Islander lands. We pay respect to the world's oldest continuing culture and First Nations peoples' deep and continuing connection to Country, and hope that our work can benefit both people and Country.

'Journey of unity: AEMO's Reconciliation Path' by Lani Balzan

AEMO Group is proud to have launched its first Reconciliation Action Plan in May 2024. 'Journey of unity: AEMO's Reconciliation Path' was created by Wiradjuri artist Lani Balzan to visually narrate our ongoing journey towards reconciliation – a collaborative endeavour that honours First Nations cultures, fosters mutual understanding, and paves the way for a brighter, more inclusive future.

Read our RAP

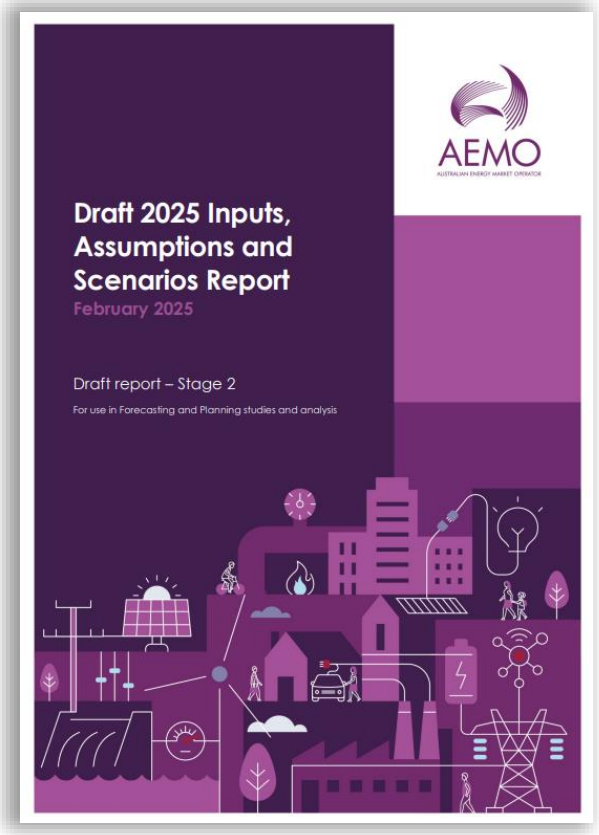
Today's agenda

Time	Item	Speaker
12:00 pm	Agenda & welcome	Samantha Lloyd, Stakeholder Engagement Lead
12:05 pm	Introduction	Andrew Turley, Group Manager Forecasting
12.15 pm	Scenarios & Stage 1 insights	Dan Collins, Manager Sector Coupling
12.25pm	Draft 2025 IASR Stage 2 key changes	Dan Collins, Manager Sector Coupling
		Deb Marsh, Manager Energy Forecasting
		Saliw Cleto, Manager Integrated Modelling
		Natasha Sinclair, Specialist Sector Coupling
1:10 pm	Q&A	All
2:00 pm	Survey and close	All

Today's objectives

Present and discuss the IASR to support stakeholder engagement and submissions for Stage 2 of the Draft 2025 IASR

Ask questions using Slido for response by AEMO in a Q&A session after the presentation



Read the report and supporting material

How to interact today

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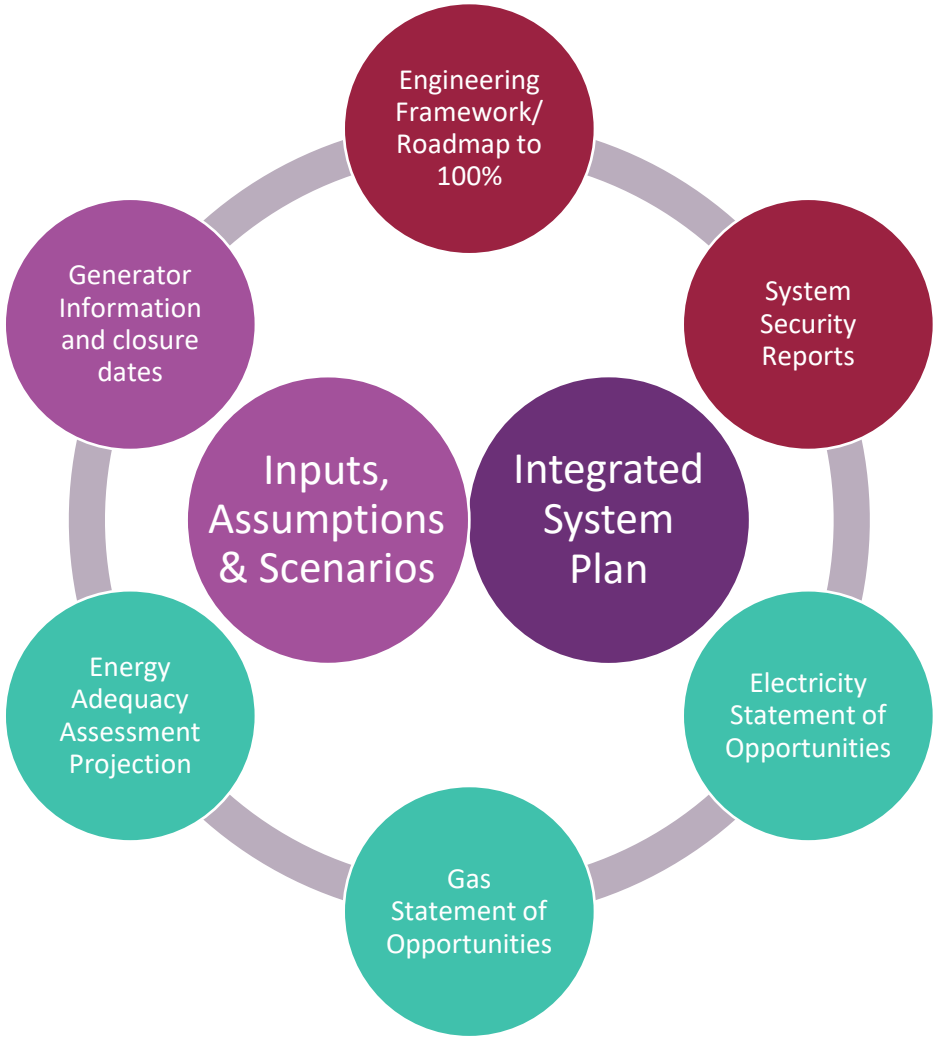
- Please ask questions using Slido www.sli.do #AEMO
- Join with your name, no need to log in
- Ask your own questions or up-vote others' questions
- Provide feedback through our post-webinar survey

Introduction – context and timing of the IASR

AEMO's NEM planning and forecasting publications



Security

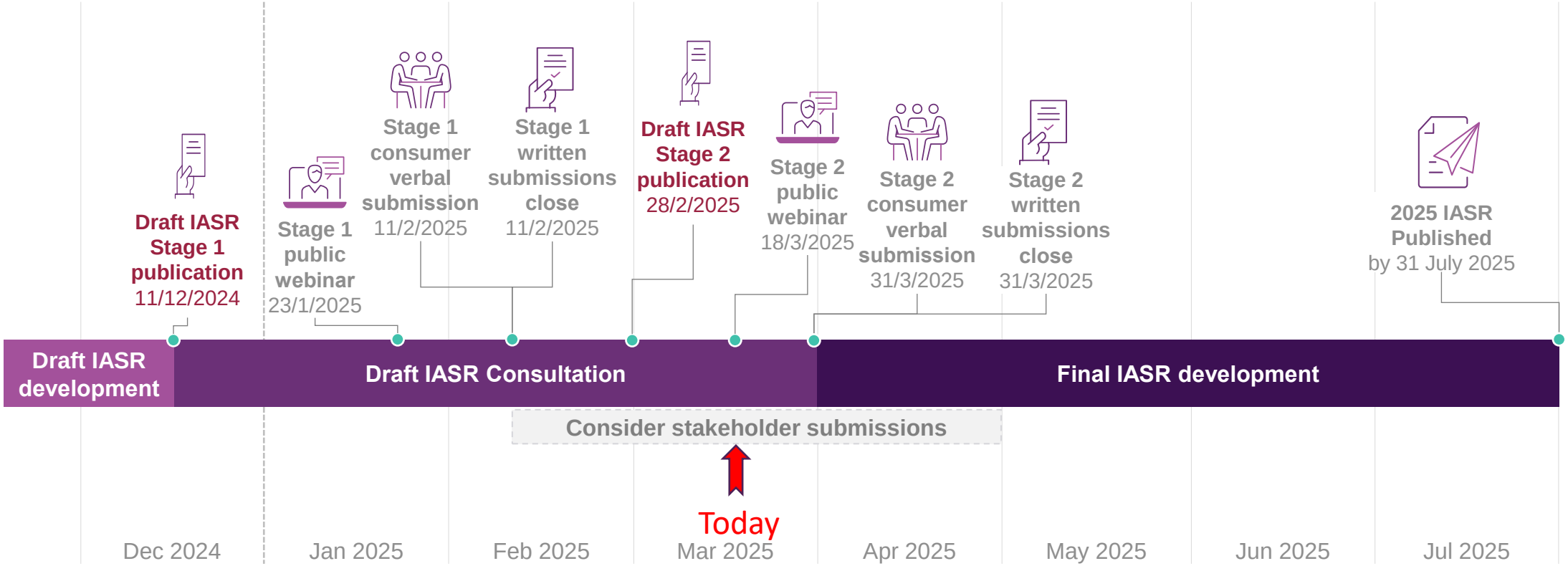
Reliability

Data

Infrastructure

Draft IASR – two-stage approach

- AEMO has released the Draft 2025 IASR in two stages for consultation due to the expanded scope of ISP considerations arising from the recent AEMC rule changes.
- Engaging with stakeholders is essential for the effective implementation of inputs and assumptions in AEMO publications.



Scenarios and Stage 1 insights

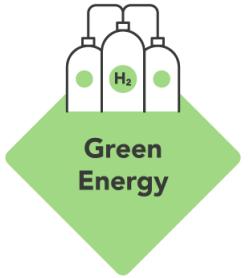
Scenario overview

Pace of decarbonisation

Energy sector contribution to decarbonisation (NEM states)

- Meets Australia's current policy commitments to support and drive the transition to a net zero economy.
- This scenario has more challenging economic conditions and features closures for energy-intensive industry, higher relative technology costs and more supply chain challenges relative to other scenarios.

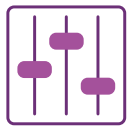
- A scale of energy transformation that supports Australia's contribution to limiting global temperature rise to below 2°C and, in some circumstances, 1.5 °C by the year 2100.
- The electricity sector plays a significant role in decarbonisation. The broader economy utilises the electricity sector's low emissions footprint to decarbonise through electrification.
- Consumers provide rapid and significant investments in coordinated consumer energy resources (CER), including electrification of the transportation sector.



- Reflects very strong decarbonisation activities domestically and globally that are aimed at limiting temperature increase to 1.5°C by 2100, resulting in rapid transformation of Australia's energy sectors, including a strong use of electrification, green hydrogen and biomethane.
- The electricity sector plays a very significant role in decarbonisation.
- AEMO is seeking stakeholder feedback on two variants of this scenario: Green Energy Exports and Green Energy Industries. See the Draft IASR for details.

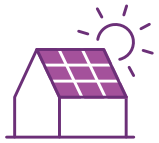
Insights from Stage 1 submissions

***Green Energy* scenario**: Majority of stakeholders supported *Green Energy Industries* variant, which emphasises domestic and commodity opportunities over a larger scale of energy exports.

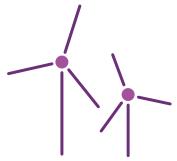


Scenarios: Support for moderation of *Step Change* and *Progressive Change* to reflect less consumer engagement. Support for industrial and commercial load closures in *Progressive Change*.

Policy and emissions targets: Suggestions that AEMO explores investment impacts associated with challenges in achieving policy targets.



Consumer Energy Resources (CER): Suggestions that AEMO should better understand distribution networks and how they might host more CER and distributed resources.



Renewable Energy Zones (REZs): Support for AEMO's focus on REZ development to unlock renewables potential, and for moving to locational cost factors to explain build cost differential. Suggestion for AEMO to explore the potential of quantifying social licence evaluation factors by project.

Other topics: included gas prices, demand side participation, large loads, weather stations, capital costs and capacity factors.

Key changes

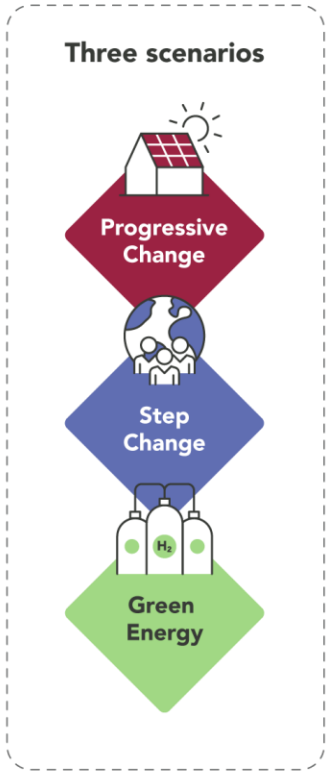
Stage 2 content summary

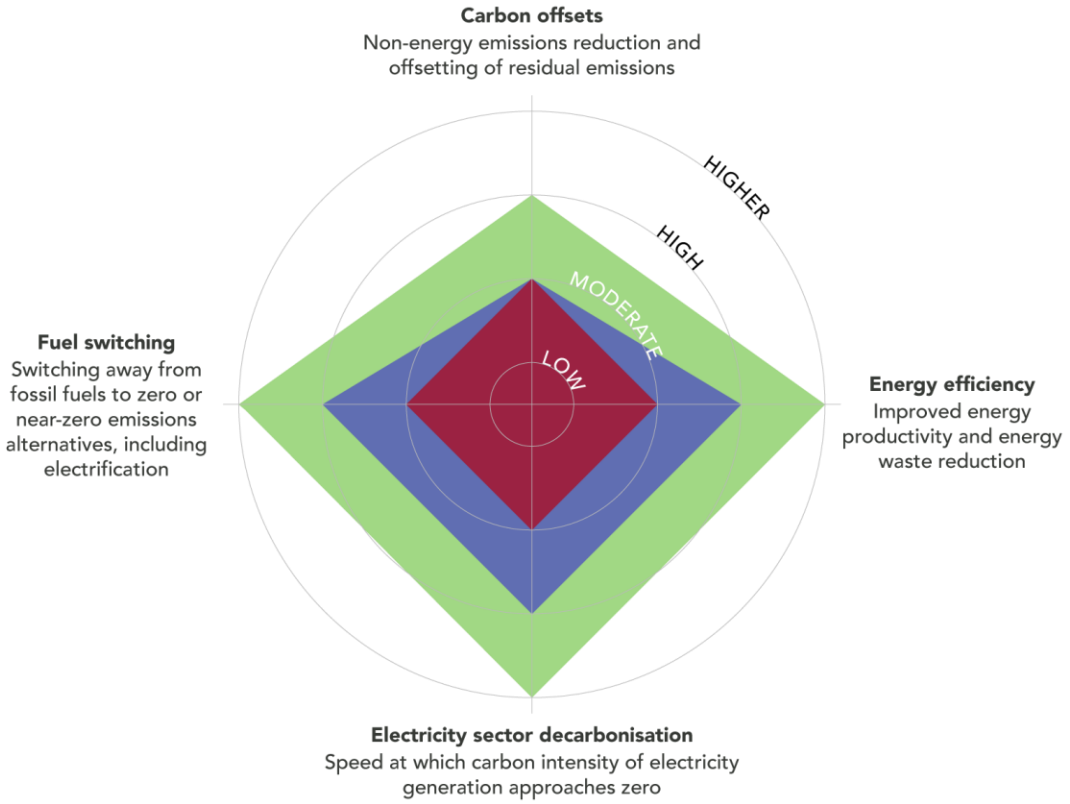
New content added for Stage 2 describes the pace of decarbonisation in the Australian economy in each of AEMO's planning scenarios, particularly emissions reduction expected in the energy sector, and emissions reduction expected outside the energy sector including through sequestration (mainly in the land-use sector).

Translating international climate scenarios to NEM-wide carbon budgets	Multi-sectoral modelling, including key assumptions and outcomes and carbon sequestration	Comparing energy end-use across the scenarios
Fuel-switching through electrification and alternative renewable gases	Electric vehicles	Hydrogen infrastructure
Energy efficiency investments	Impacts of planning, environmental and supply chain considerations	Sensitivities

Introduction to multi-sectoral modelling

CSIRO modelled least-cost pathways by scenario for the Australian economy to achieve emissions targets



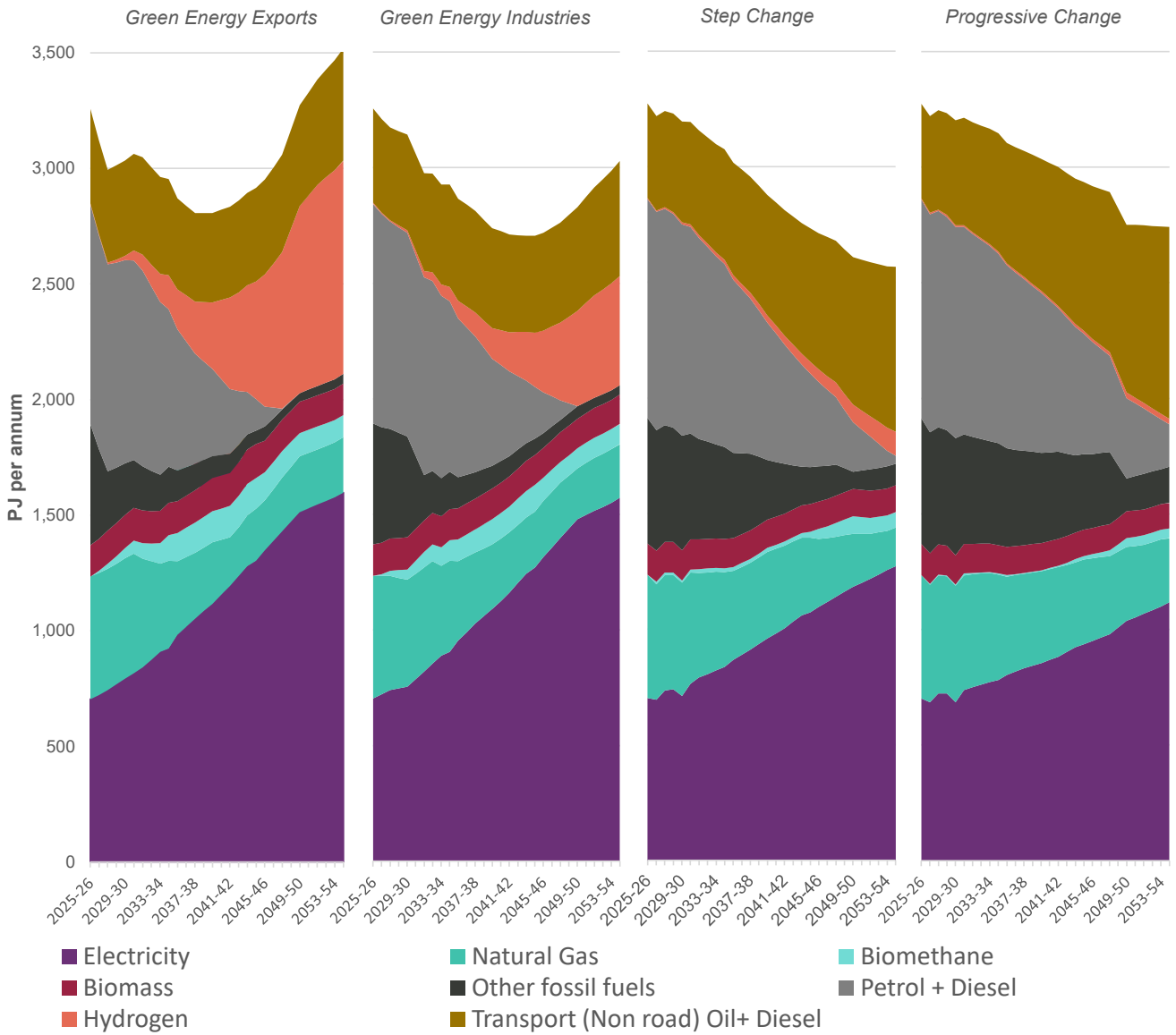


To transition Australia's economy, **four pillars of decarbonisation** are identified:

- Energy efficiency
- Decreasing carbon intensity of electricity generation
- Switching away from fossil fuels
- Non-energy emissions reduction and offsetting

Multi-sectoral modelling reflects scenario narratives

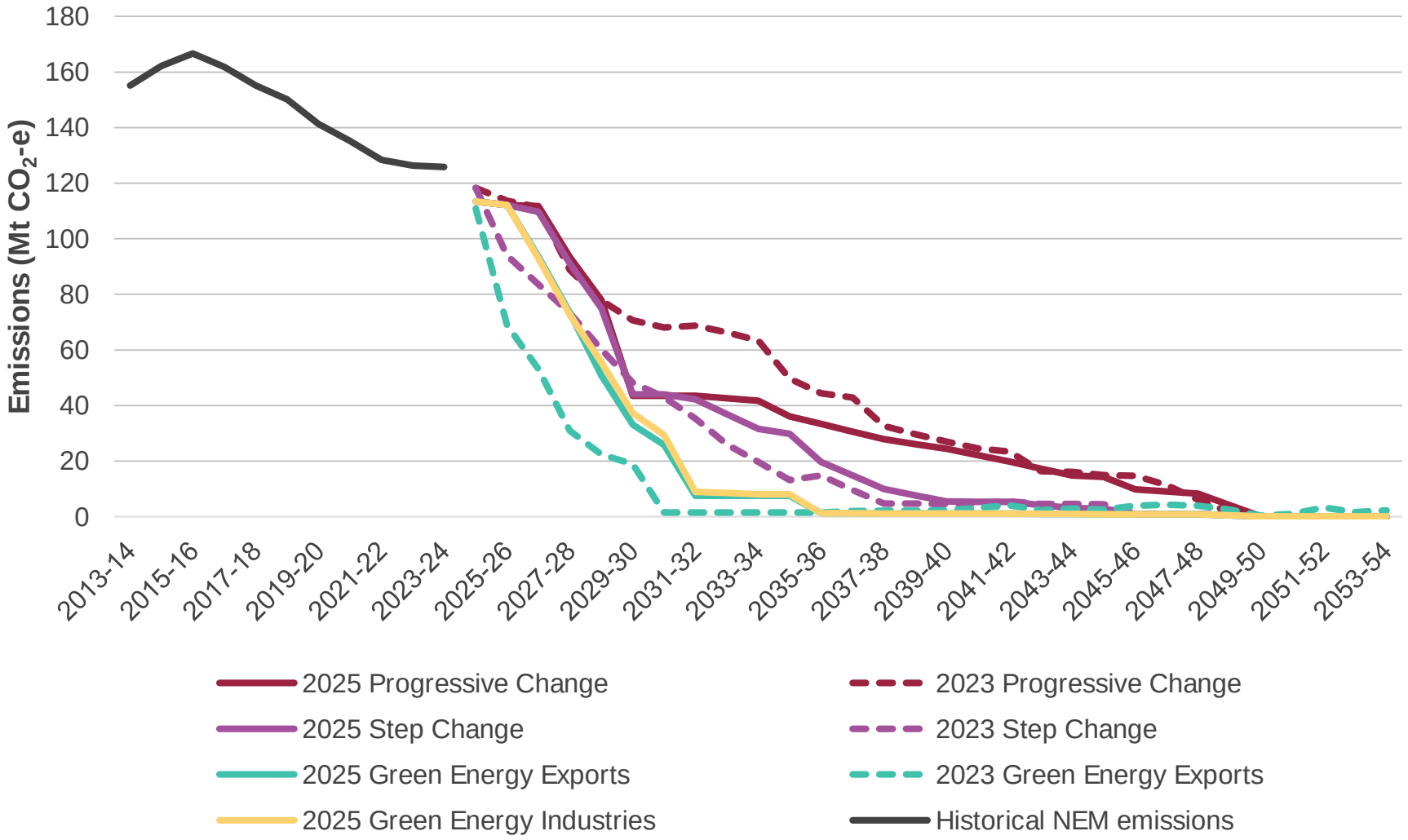
End-use fuel consumption by scenario, PJ/year



- Electricity consumption increases across all scenarios, reflecting the role of electrification in the efforts to reach net zero emissions by 2050.
- In the *Green Energy* scenario variants, the increase in fuel consumption in the last ten years of the outlook period serves to meet stronger economic growth.
- The *Green Energy* scenario variants also see a larger share of hydrogen use for green commodities, and biomethane serves as a substitute for natural gas.

Legislated emissions reduction policies narrow scenario differences while temperature-linked cumulative carbon budgets influence the long-term trajectory to net-zero

Actual and forecast NEM emissions trajectories from multi-sectoral modelling

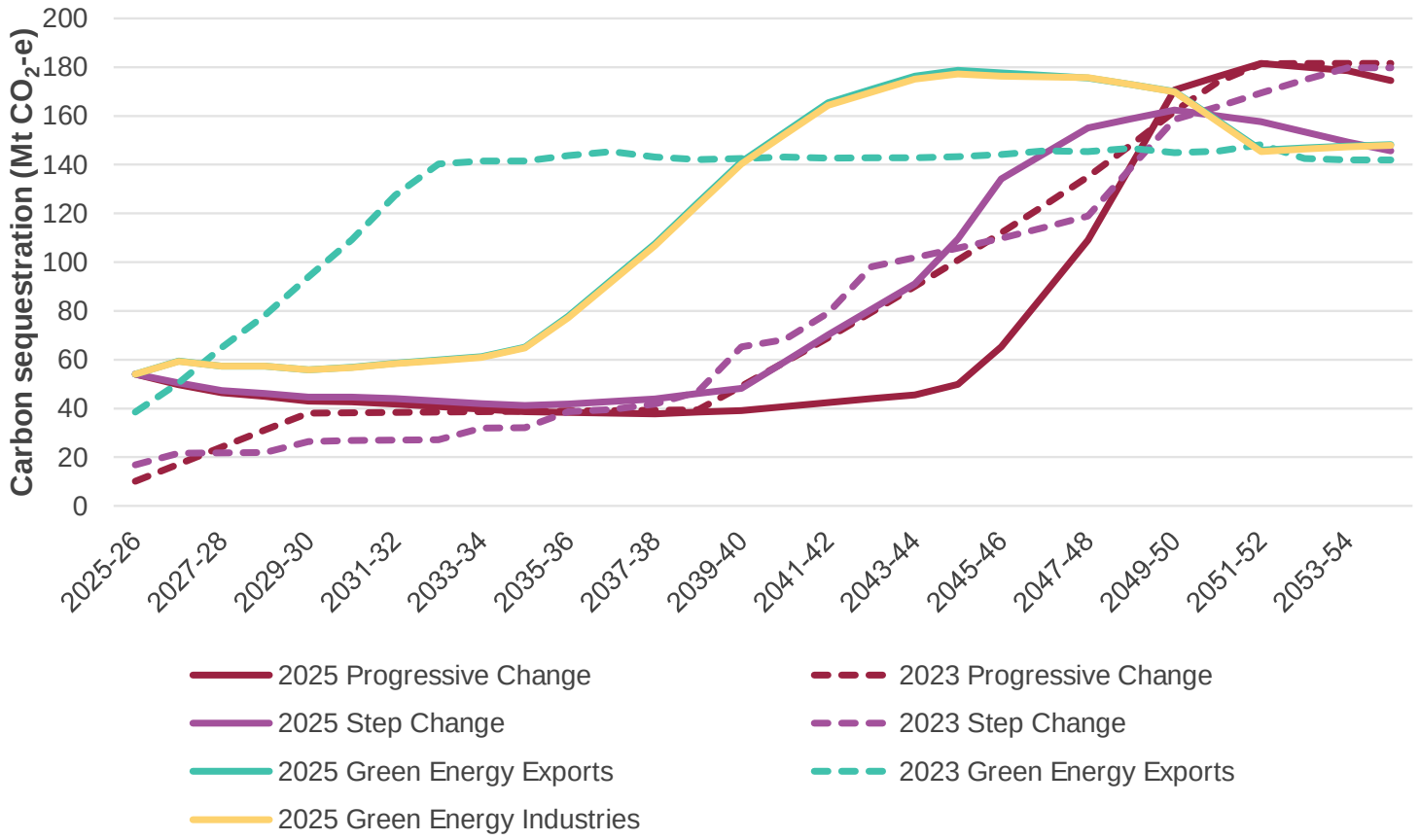


Changes since 2023:

- ***Progressive Change*** – inclusion of updated policies results in sharper decline in emissions early on
- ***Step Change*** – greater levels of carbon sequestration in other sectors allow for more NEM emissions
- ***Green Energy Exports / Industries*** – economy-wide carbon budget updated to align with Climate Change Authority's *Sectoral Pathways Review*

Carbon sequestration is a key pillar in economy-wide decarbonisation

Carbon sequestration due to land-based sequestration and process-based carbon capture and storage in the NEM



Sequestration is achieved through:

- Existing and new land-based sequestration (via natural biological processes)
- Direct air capture technologies
- Carbon capture and storage from emitting processes

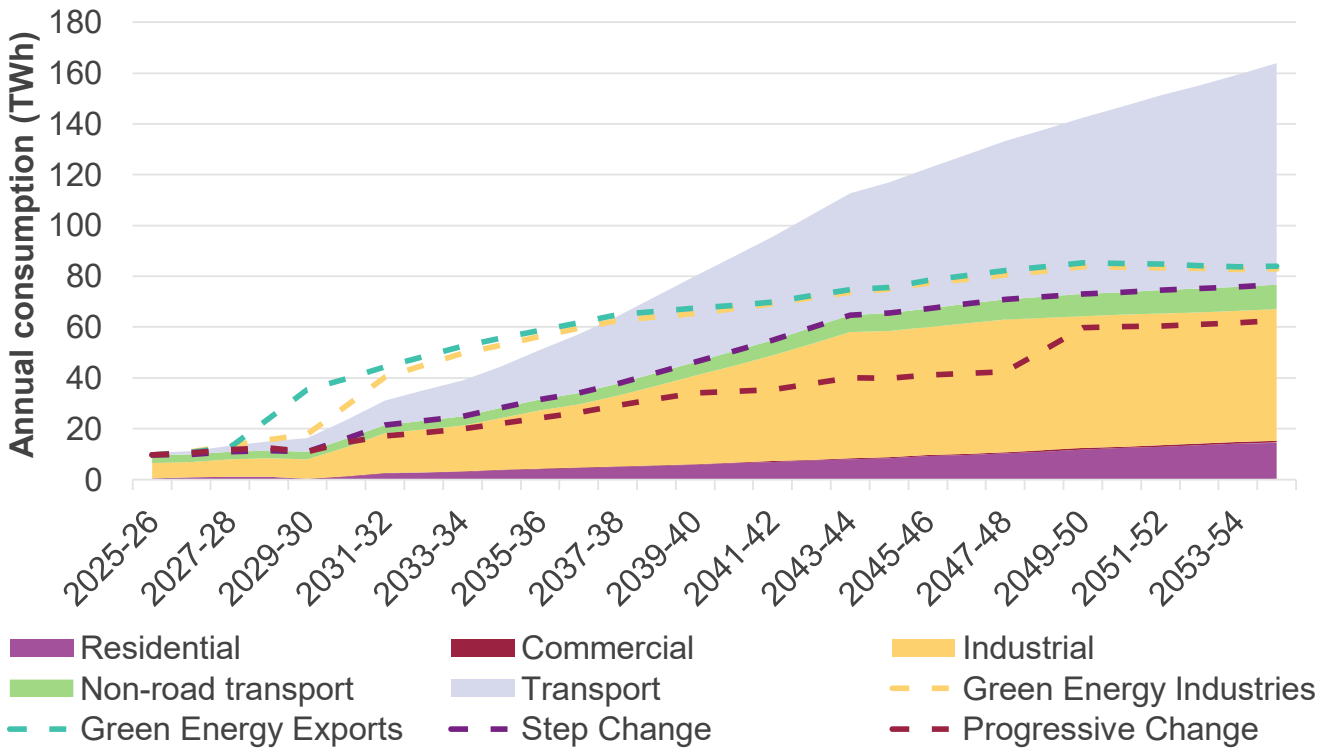
Compared to 2023:

- Higher starting levels due to upward revision of existing land-based sequestration inventories
- Improved assumptions around representation of sequestration in land use, land use change and forestry

Road transport and industrial electrification dominate over non-road and residential

NEM and WEM forecasts for:

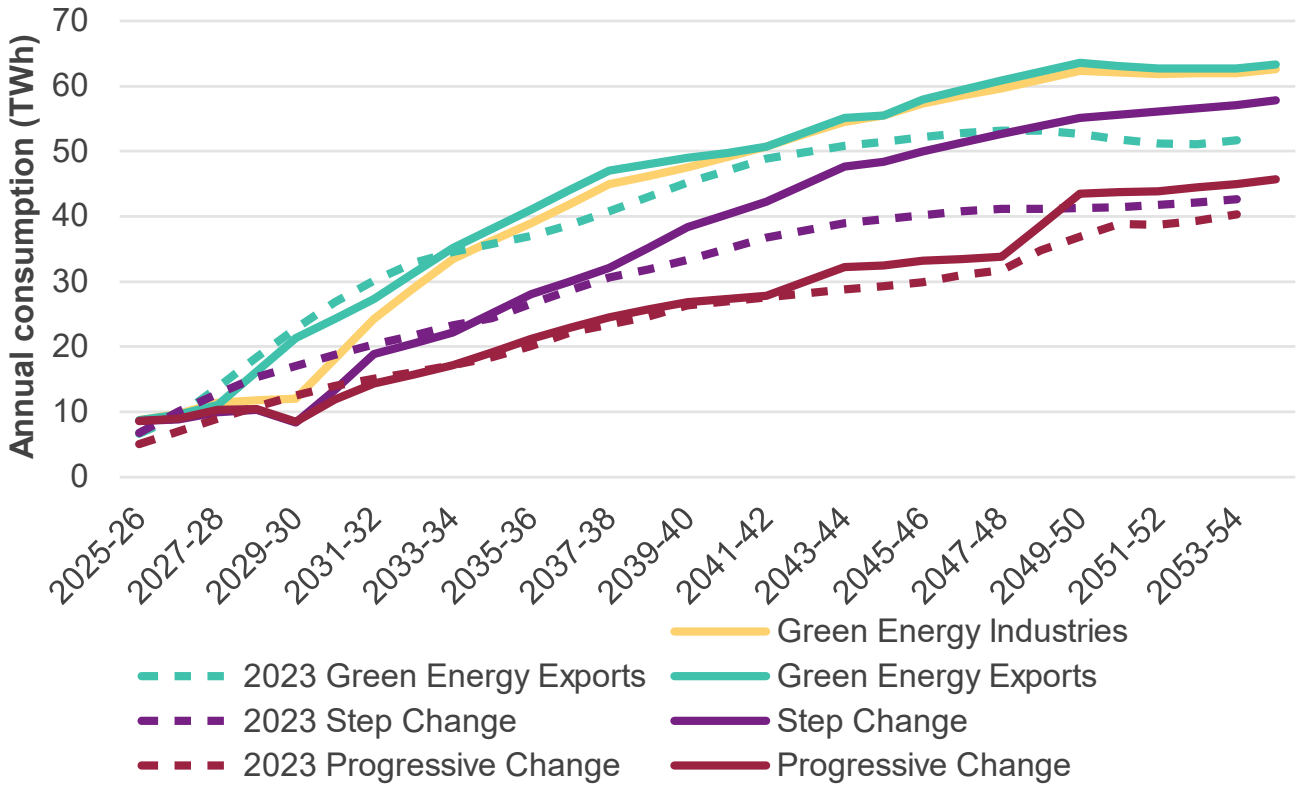
- Total electrification for Step Change scenario (stacked area chart), and
- Electrification excluding road transport for all scenarios (dashed lines)



- Across the NEM and WEM, 60%-80% of electrification (excluding road transport) in the *Step Change* scenario is in the industrial sector. This proportion varies by region.
- Electrification of all sectors other than road transport is greater in the *Green Energy* scenario variants than in *Step Change* and *Progressive Change* across the outlook period, with faster uptake in the first ten years.

Step Change electrification grows more quickly from late 2030s compared to 2023 IASR

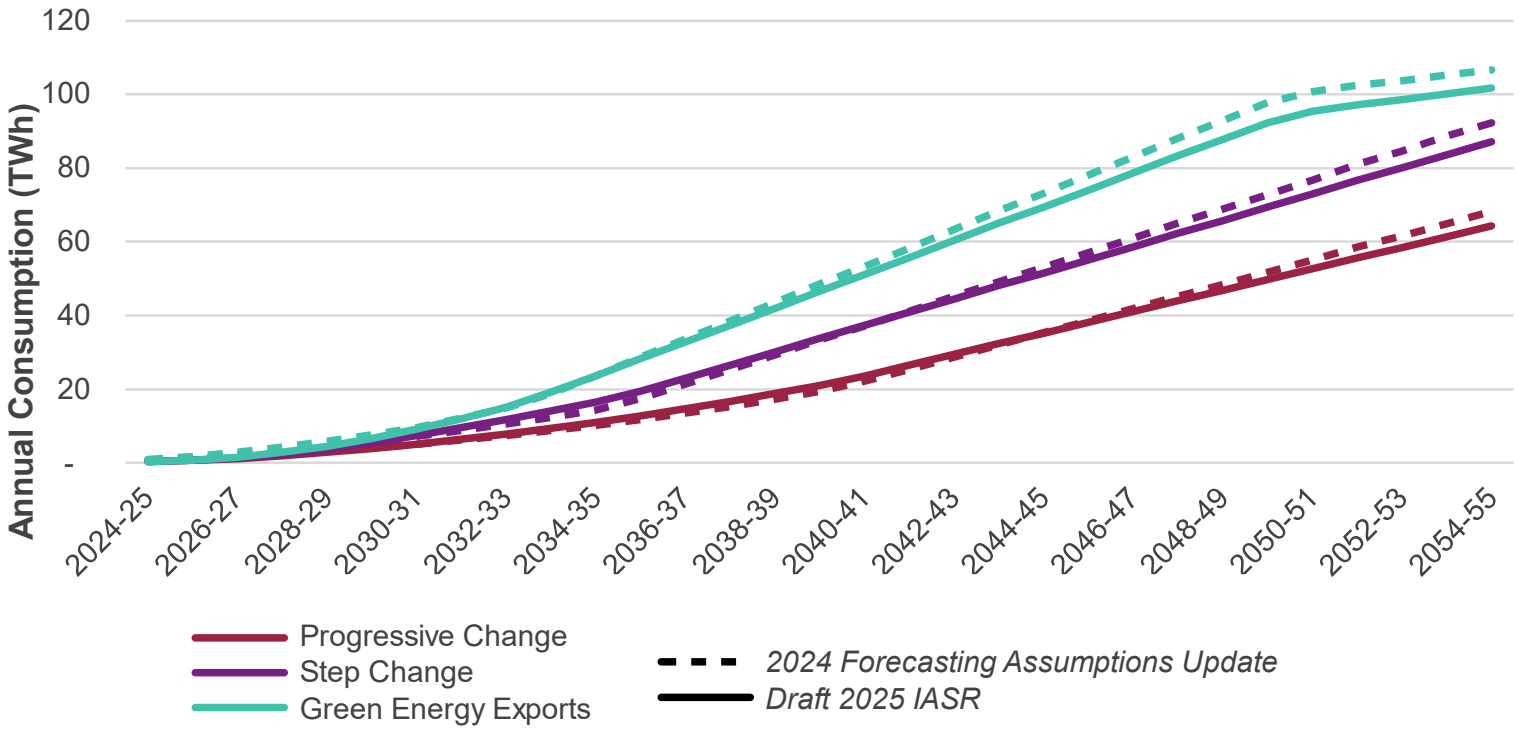
NEM-only forecasts for electrification (excluding road transport) for all scenarios



- Electrification in the *Step Change* scenario is slower than in 2023 IASR initially but accelerates more rapidly from 2034-35, largely due to faster uptake of electrification in manufacturing.
- The rate of electrification uptake in the *Progressive Change* scenario is similar to the 2023 IASR.

Electric Vehicle energy use similar to previous forecasts

EV energy consumption similar (or slightly lower) compared to 2024 Forecasting Assumptions Update



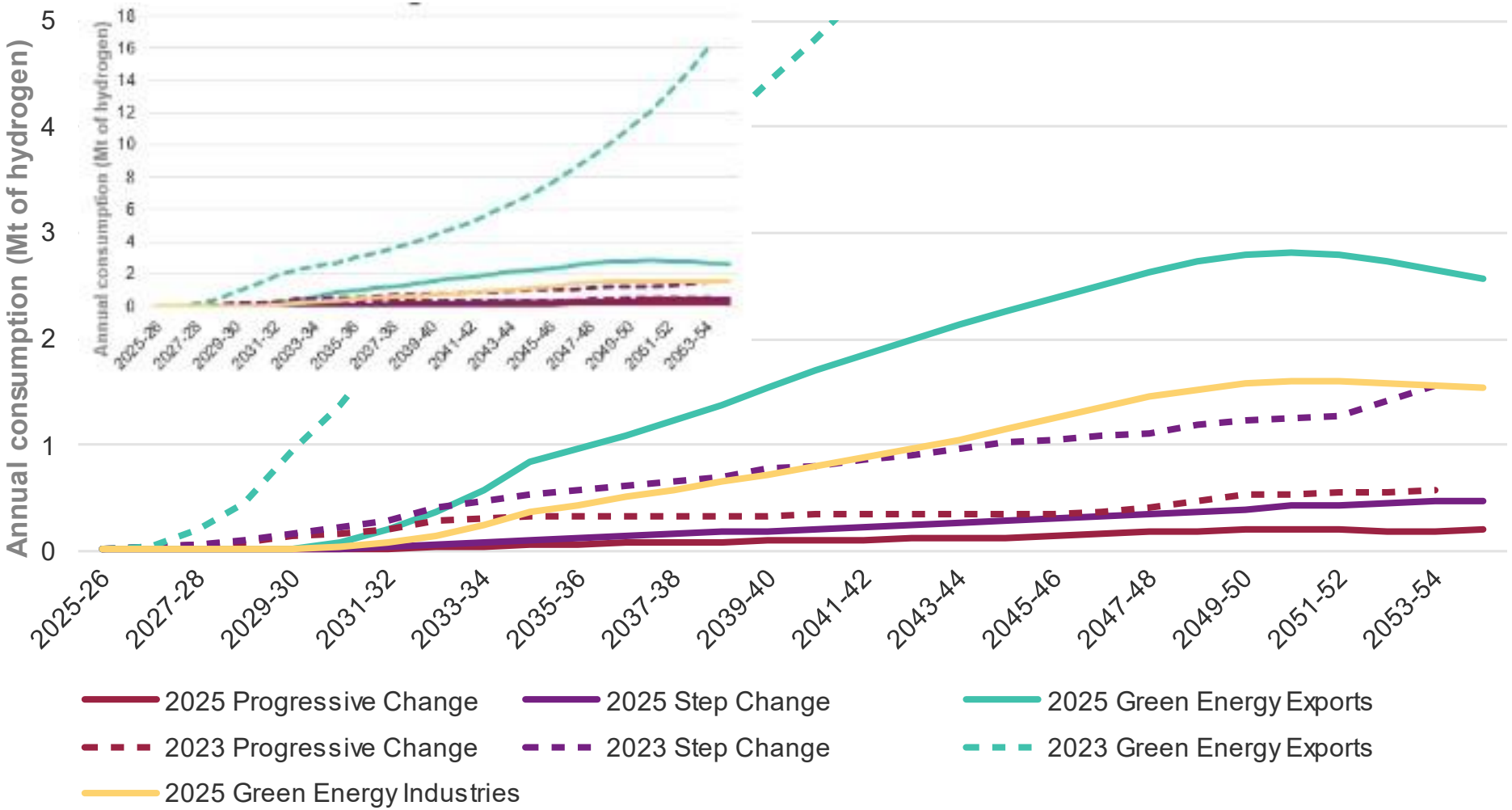
Forecast BEV and PHEV electricity consumption (NEM and WEM) by scenario

- EV fleet numbers are forecast to be higher – between 15 million and 26 million (64% to 95% of the whole fleet) by 2050 across the scenarios.
- Electricity consumption from EVs is similar/slightly lower despite increased fleet numbers due to improved efficiency of mid-size EVs.
- *Progressive Change* assumes greater penetration of hybrids and fewer Battery EVs, while *Step Change* and *Green Energy Exports* assumes fewer hybrids and greater Battery EV uptake, based on anticipated impact of New Vehicle Efficiency Standard (NVES)*.

* Under NVES which starts in 2025 and runs until 2029-30, manufacturers must meet per-km efficiency standards for new light vehicles, with penalties/credits for under/over-achievement.

Hydrogen forecasts reflect stakeholder feedback

Total NEM on-grid hydrogen volume



Assumptions:

Grid connection:

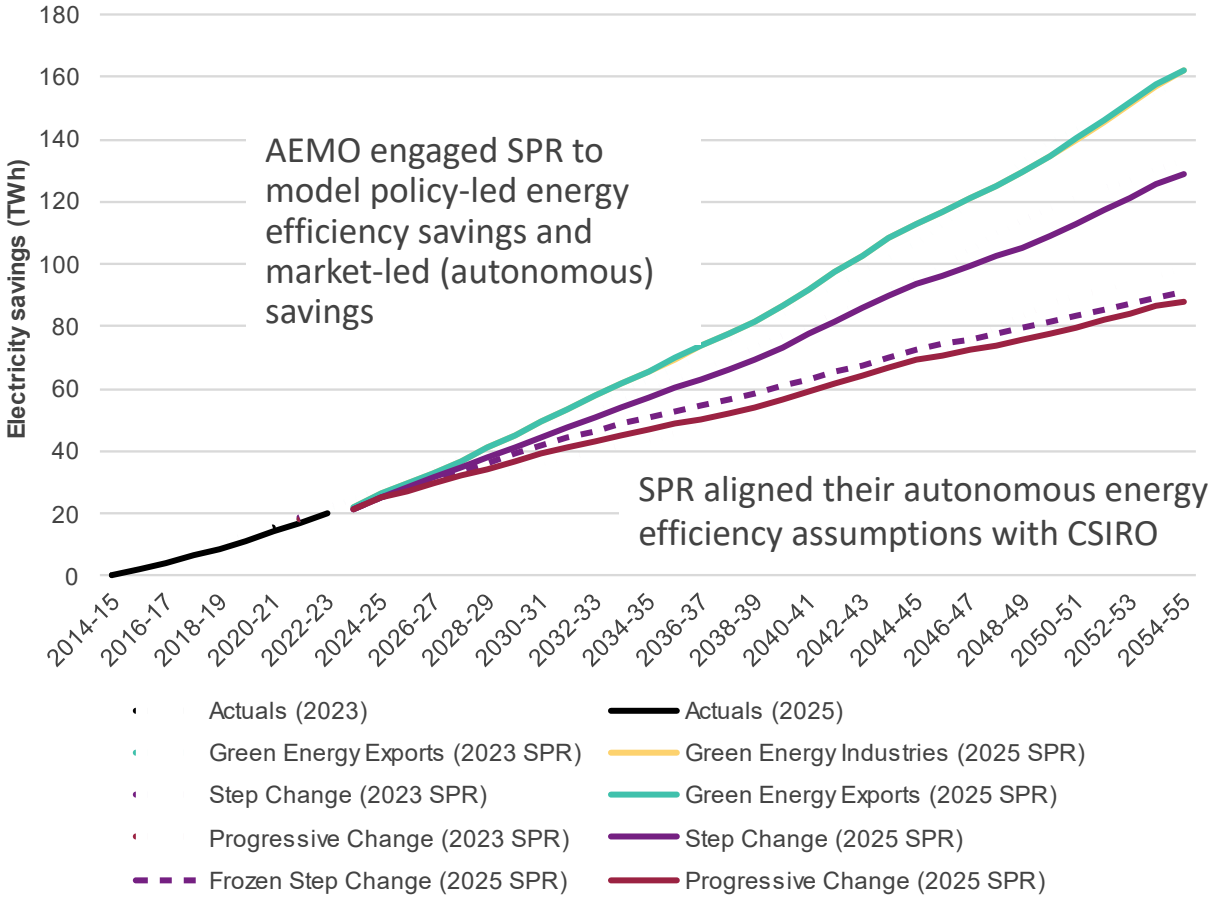
- Developed by CSIRO
- Based on CSIRO's HyResource data
- Larger projects will see advantages in off-grid electrolysis

Utilisation factors:

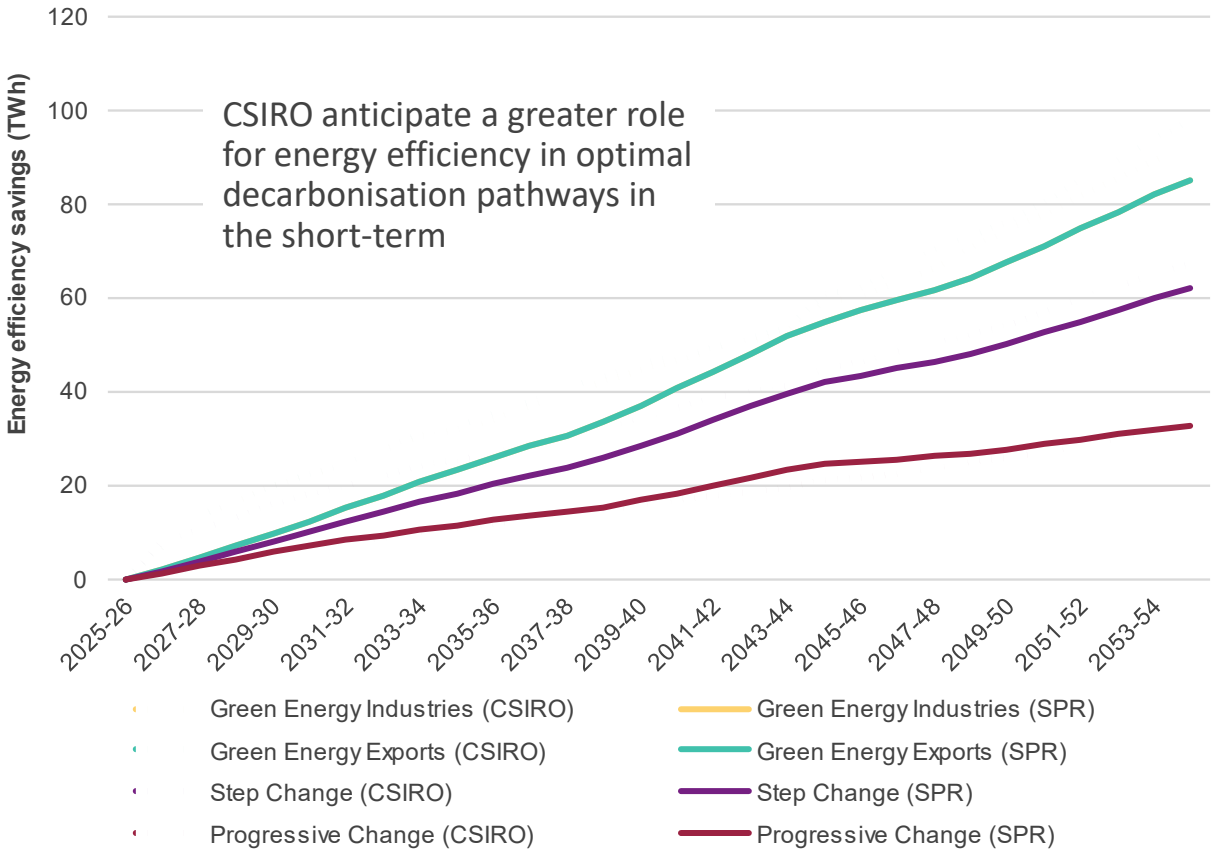
- Minimum utilisation factor for electrolysers of 70% was assumed in early years, reducing to 35% by 2050s

Energy efficiency reflect policies, and aligns with 2023 IASR

SPR electricity energy efficiency savings, Australia



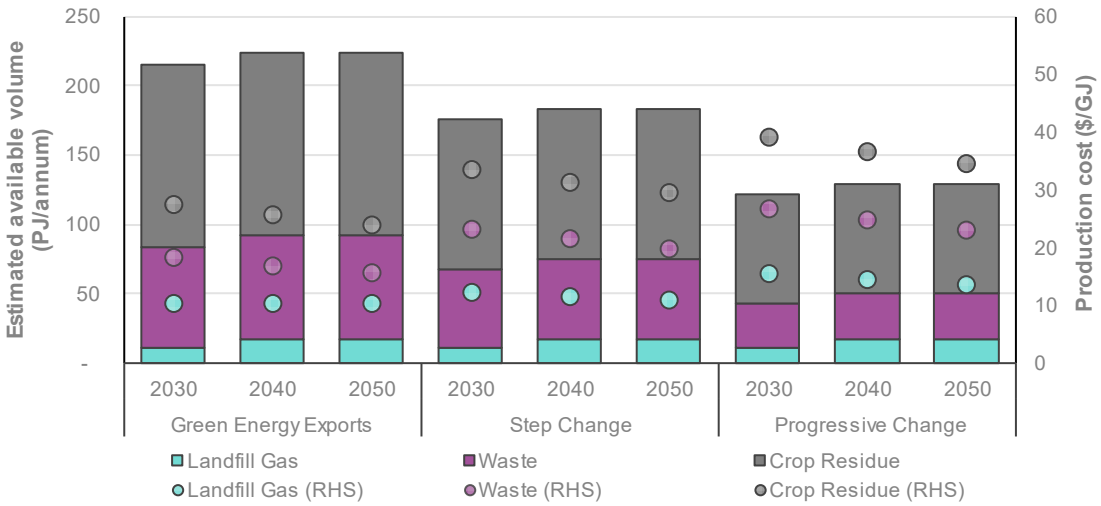
SPR policy-led and CSIRO endogenous electricity savings



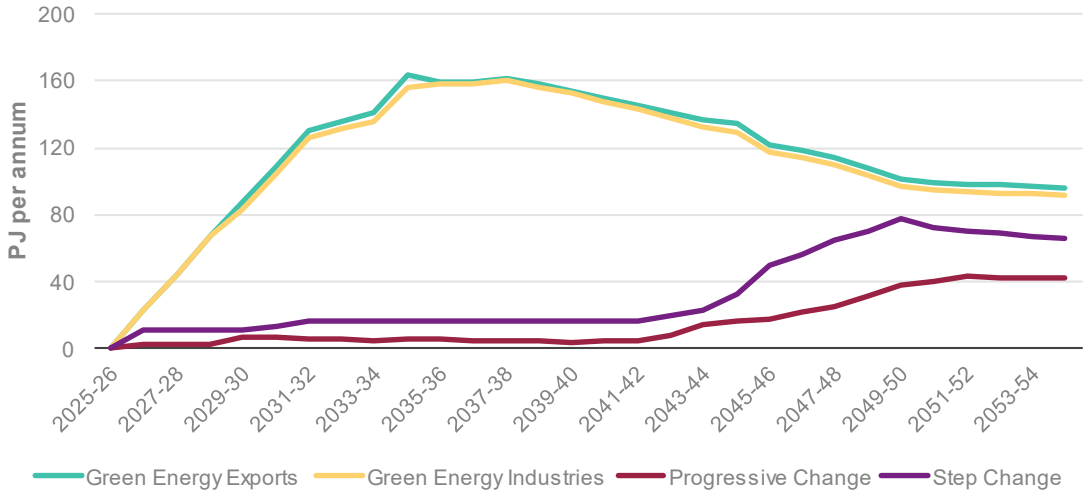
Note: SPR attributes minor differences in actuals in 2023 and 2025 to updated data from the Commercial Building Baseline Study and replacement of Australian Energy Statistics (AES) data with AEMO meter data.

Biomethane is proven but untapped

Estimated available volume



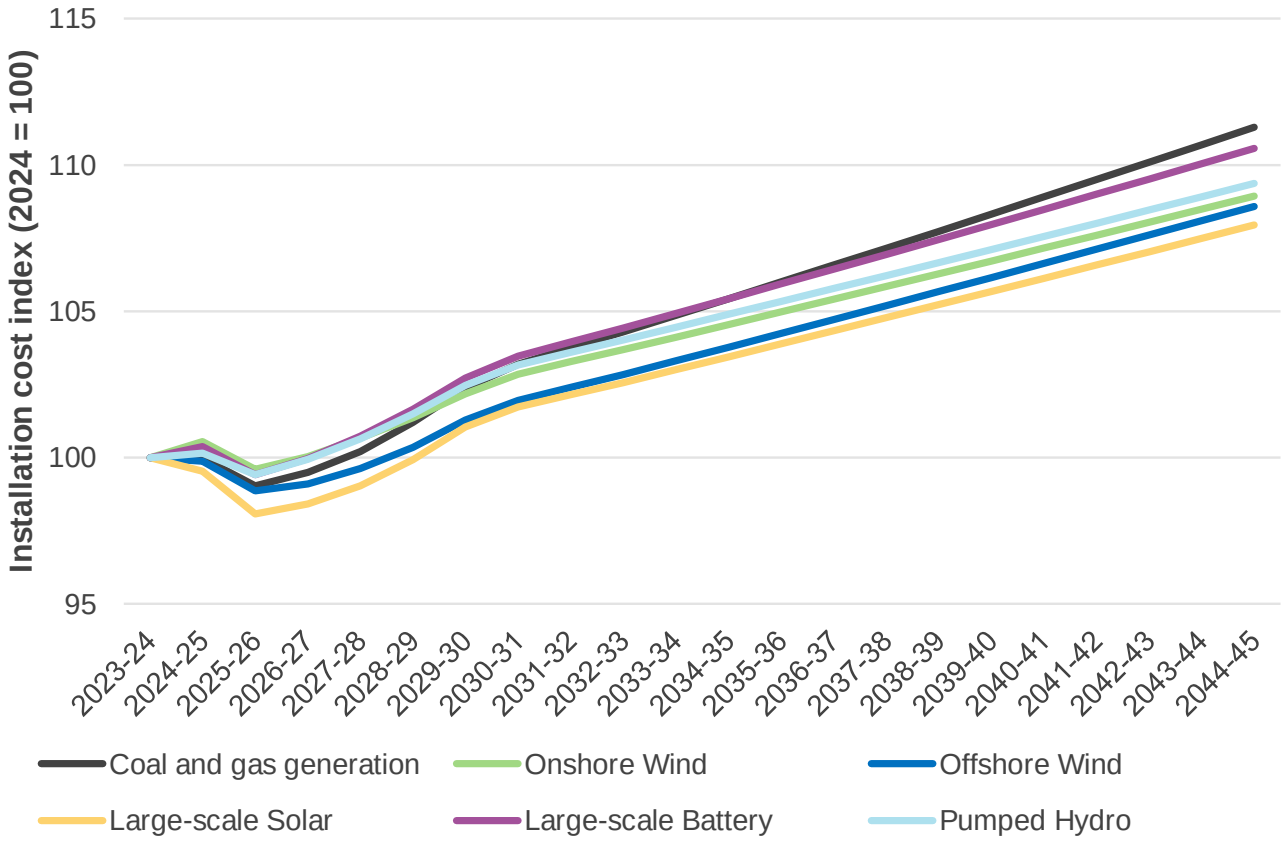
Estimated uptake in multi-sectoral modelling



- Although a proven technology widely used in Europe and other countries, there is relatively low existing biomethane production in Australia.
- Lower emissions intensity of gas is possible by blending in low/zero emissions biomethane.

Increasing labour and installation costs will impact energy infrastructure projections

Installation cost escalation for various generation and storage technologies, 2024 real $



1. Real installation cost escalations are projected due to supply chain limitations and increased competition for skilled labour in energy infrastructure projects. This escalation is intended to be considered in the development of the capital cost forecasts for the IASR.

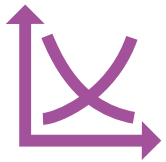
2. Based on analysis of completed energy infrastructure projects, lead time adjustments relating to the impact of planning and environmental approvals vary between regions depending on jurisdictional planning pathways.

CSIRO GenCost report (https://www.csiro.au/-/media/Energy/GenCost/GenCost2024-25ConsultDraft_20241205.pdf)

Additional sensitivity analysis following ISP Review recommendations

- **Alternative coal retirement schedules** – exploring the implications of alternative coal retirement schedules on new generation, storage and network investments.

- **Alternative CER uptake** – examining the impact of lower or higher CER uptake on power system development, particularly distribution networks. This will support the Demand Side Factors statement published with the ISP.



- **Constrained supply chains** – exploring the impact of limitations to supply chains, workforce availability and other factors that may slow development.

Next steps

Upcoming engagement opportunities

2025 IASR:

- Submissions to the Draft 2025 IASR (Stage 2): due 31 March 2025
- 2025 IASR to be finalised in July 2025

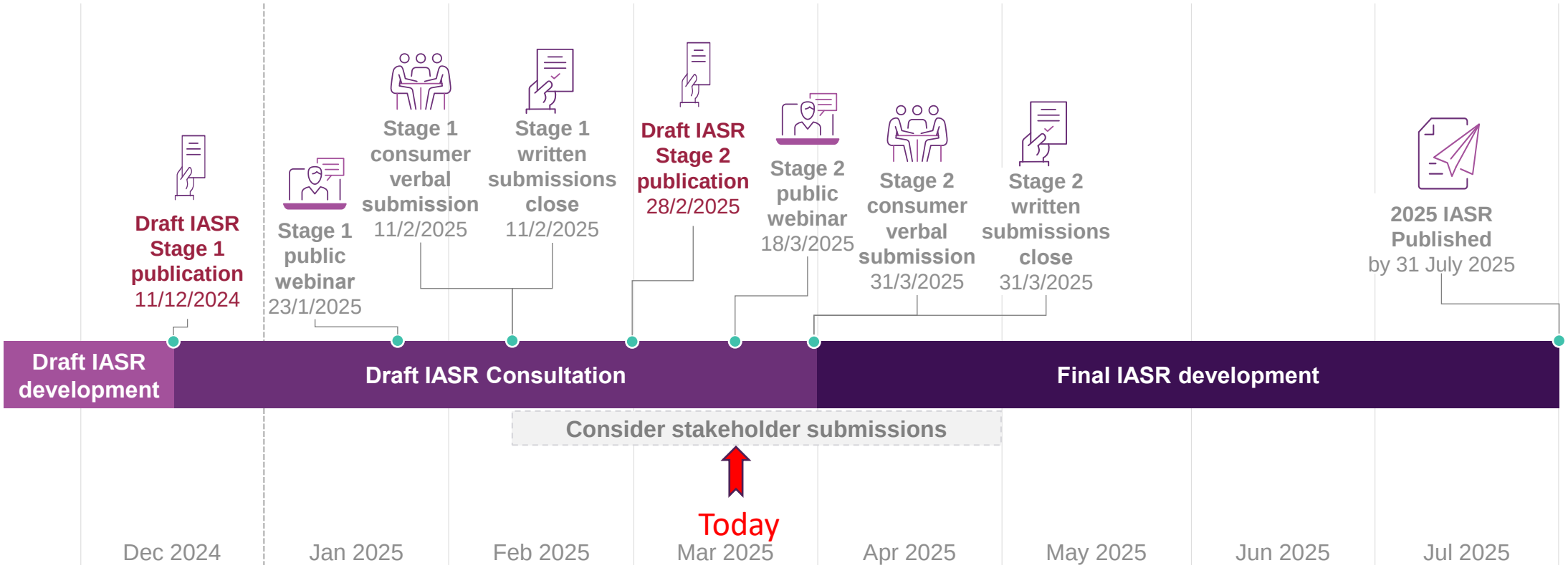
❖ Stage 2 Consumer Advocate verbal submission session: 31 March 2025.

❖ The **Forecasting Reference Group** will provide additional opportunities to stay informed on evolving inputs and assumptions (meets monthly)

Additional consultation opportunities:

- **ISP Methodology**
  - Issues Paper was published in October 2024
  - Draft ISP Methodology was published on 13 March 2025
  - Webinar on 3 April and submissions due by 14 April 2025.
- **Electricity Network Options Report and Gas Infrastructure Options Report**
  - Publication of draft reports scheduled for 22 May 2025.
  - Submission milestones and engagement opportunities will be identified in the publications.

2025 IASR status and timeline



Questions and comments

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How did we go today?

Please complete the post event survey for the webinar at: https://nam.dcv.ms/WDERgTSlQJ.

Please submit your Draft 2025 IASR Stage 2 consultation submissions to forecasting.planning@aemo.com.au by 31 March 2025.

For more information visit

aemo.com.au