

Please note that this webinar will be recorded and published online



2023 Transmission Expansion Options Report Publication webinar

10 August 2023



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

We pay respect to their Elders past and present.

Today's agenda

1. Welcome and today's objectives (5 min)
2. Context for the report (5 min)
3. Consultation overview (5 min)
4. Final report and consideration of feedback (40 min)
5. Questions and comments (30 min)
6. Next Steps (5 min)

How to interact today

www.sli.do
#AEMO

- Please ask questions or make comments using Slido.
- Questions can be up-voted. AEMO will not provide responses to unanswered questions.
- When we come to your question, we will unmute you to allow you to engage with the response.
- Written replies may be provided through Slido if appropriate.
- We will also place a [direct Slido link](#) in the Teams chat.

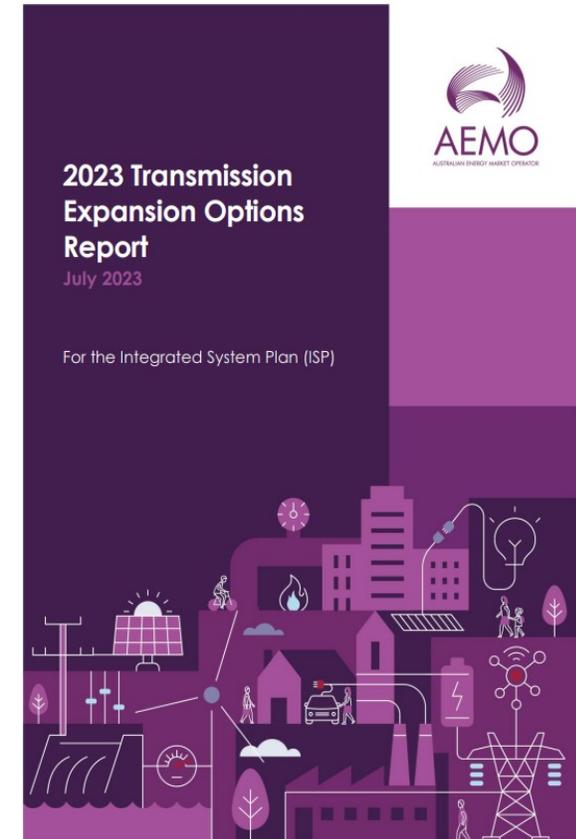
Today's objectives



Present key insights from the *2023 Transmission Expansion Options Report* and inform how feedback has been addressed.



After the presentation, there will be an opportunity to ask AEMO and consultant Mott Macdonald questions, using Slido.



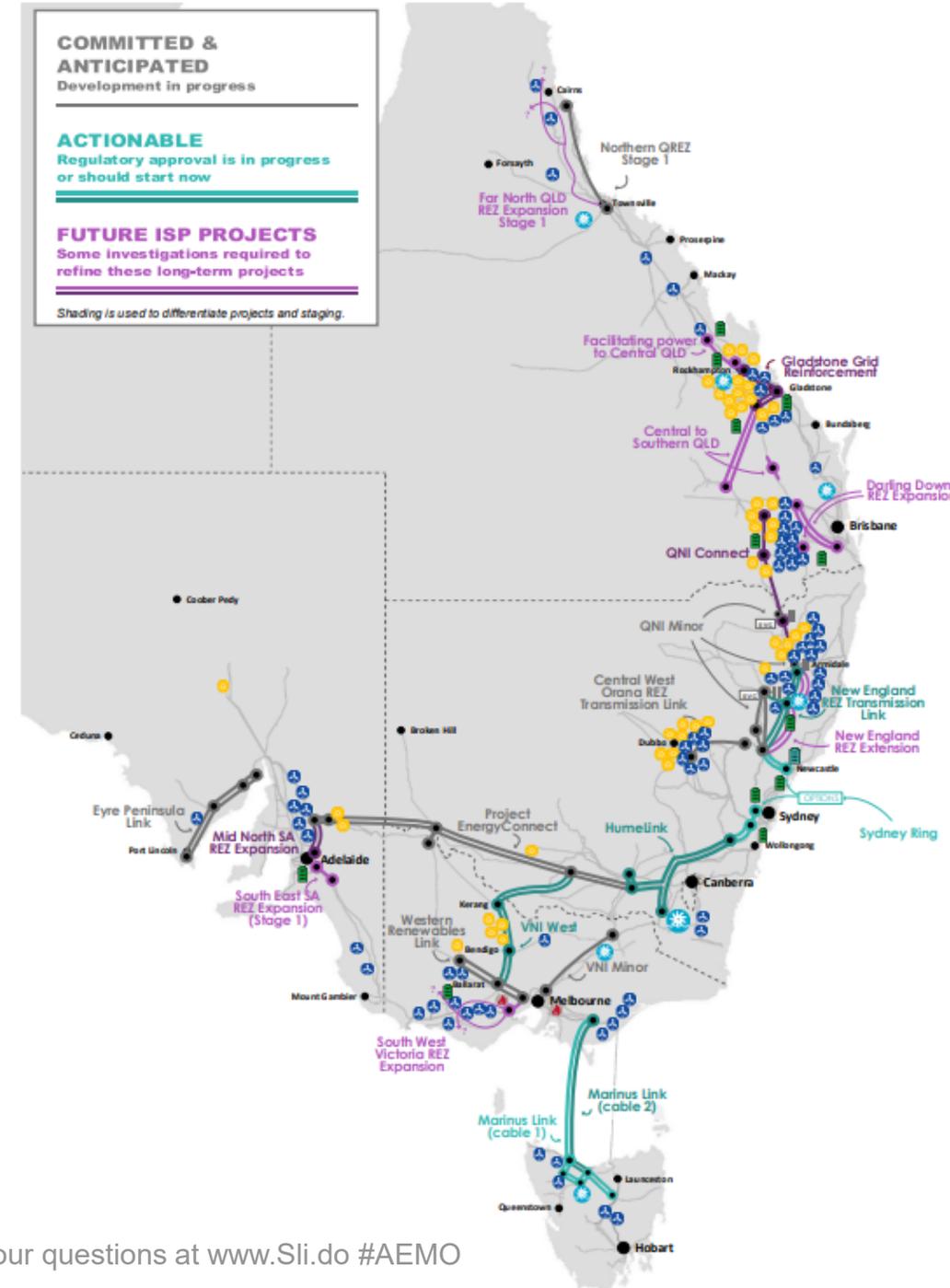
[Read the report and associated material](#)

Role of the Transmission Expansion Options Report in the Integrated System Plan (ISP)



The ISP is a plan for affordable, reliable electricity, and the transformation of the energy system

- Published every two years with involvement from over 1,500 stakeholders.
- Informs policy makers, investors, consumers, researchers, and other energy stakeholders.
- Renewable energy connected with transmission, firmed with storage and backed up by gas-fired generation is the lowest cost way to supply electricity to Australian homes and businesses as coal fired generation retires.
- Identifies actionable projects now and in the future which should progress as urgently as possible.

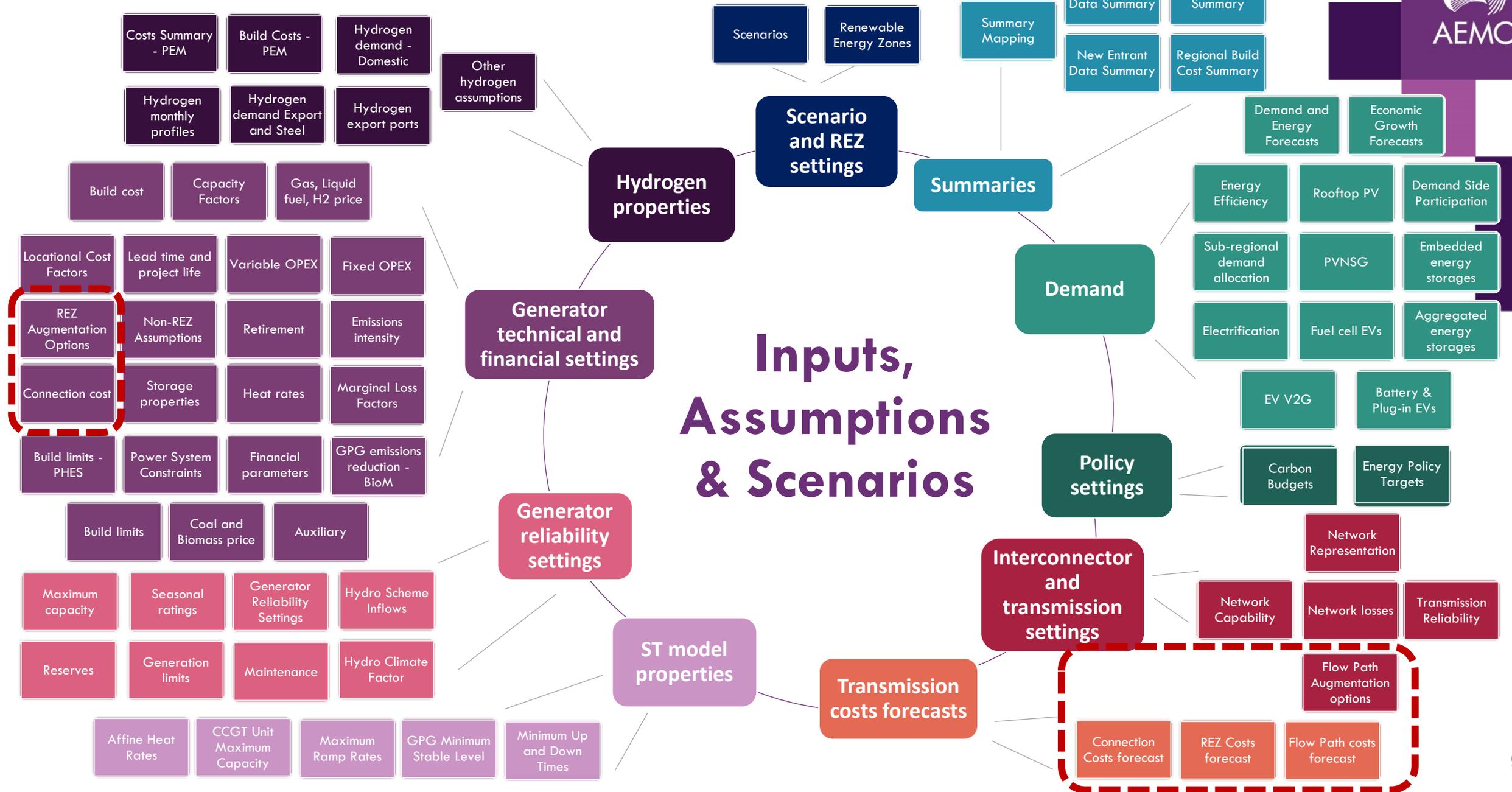


Ask your questions at www.Sli.do #AEMO

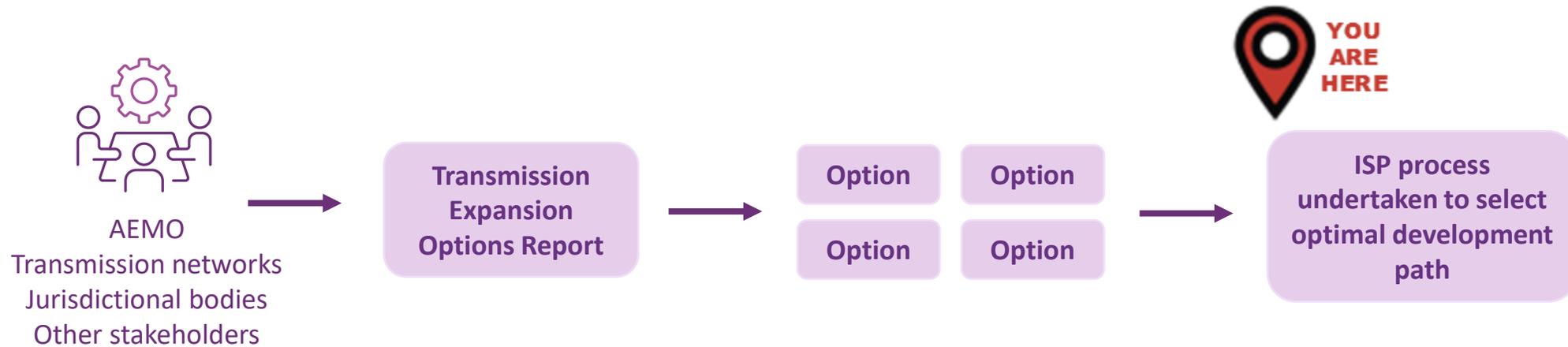
AEMO has now finalised the inputs and assumptions to be used for the Draft 2024 ISP



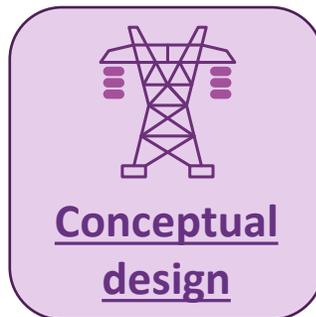
Many inputs and assumptions make up the IASR



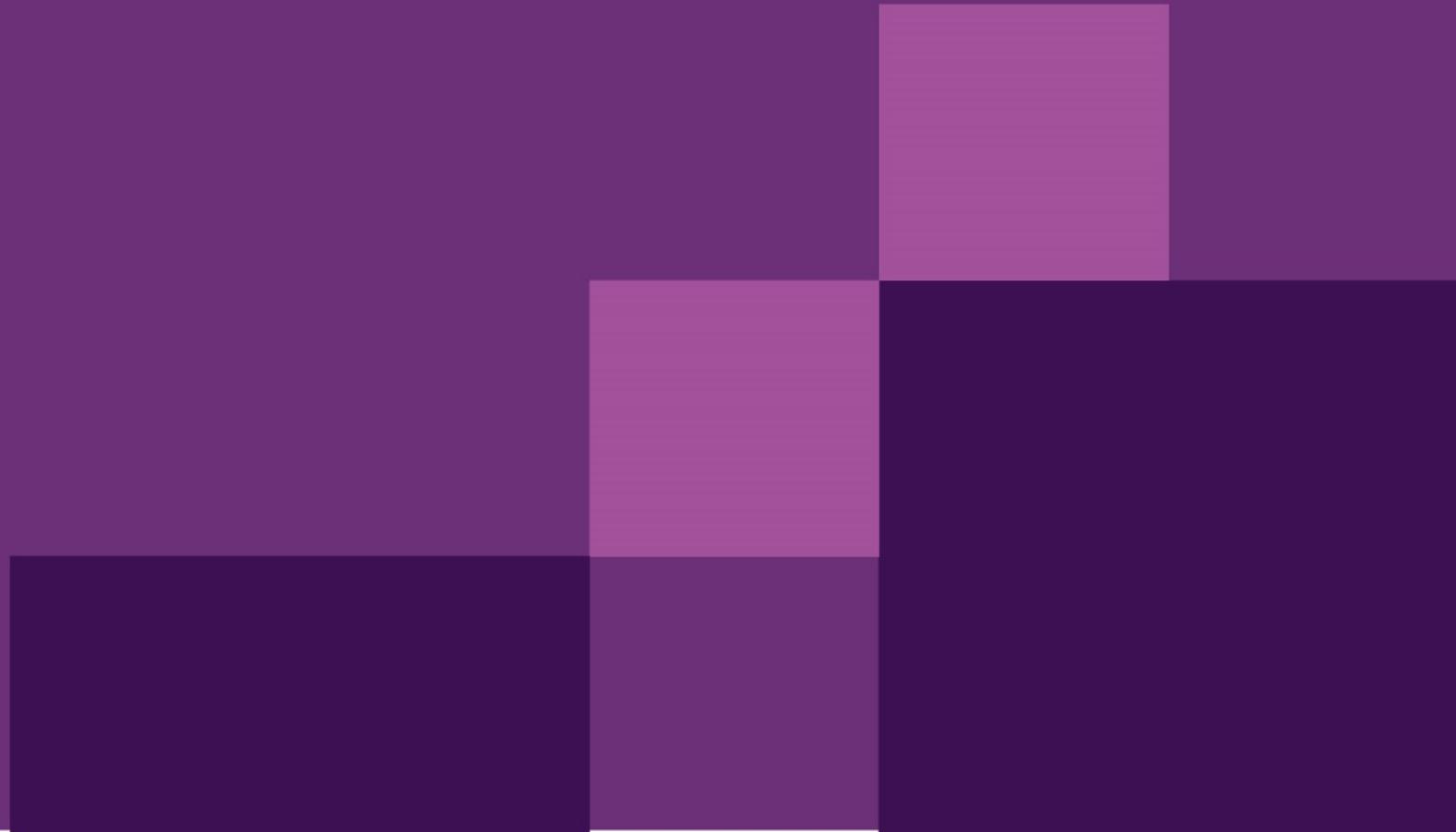
The Transmission Expansion Options Report provides options for the ISP optimal development path



Components of an option



Consultation overview



More than twenty stakeholder submissions were received in response to the draft report

Consumer and community advocates



ISP
Consumer
Panel

Generators, developers & retailers



Environmental/climate group



Local Government



Networks

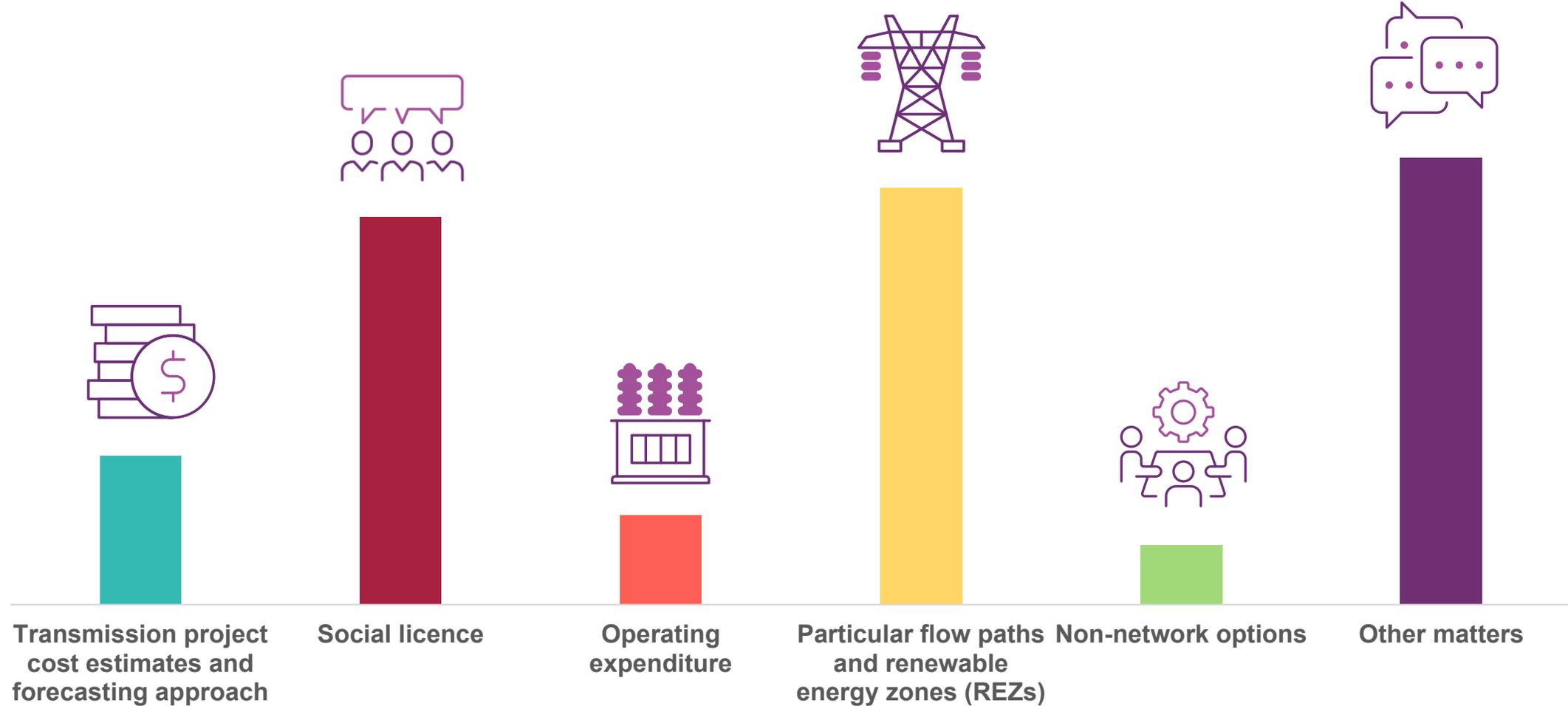


Other

Sligar and
Associates

Lisa Gervasoni
Simon Bartlett

Stakeholders gave their feedback on six key areas covered by the report



Stakeholders called for responses to transmission market pressures and a focus on transparency

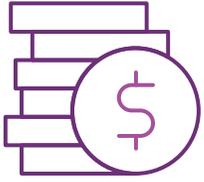


- Assuming that inflationary market pressures on transmission cost escalations will return to normal by 2026-27 is too optimistic.
- Any transmission project lead time adjustments should be transparent, based on evidence, and through joint planning with networks and jurisdictional bodies.
- Need better and more transparent incorporation of social licence.
- AEMO should change cost estimate accuracy bands to exactly match the Association for the Advancement of Cost Engineering's (AAACE's) method.
- Need better clarification of how biodiversity offset costs are treated now and in the future.



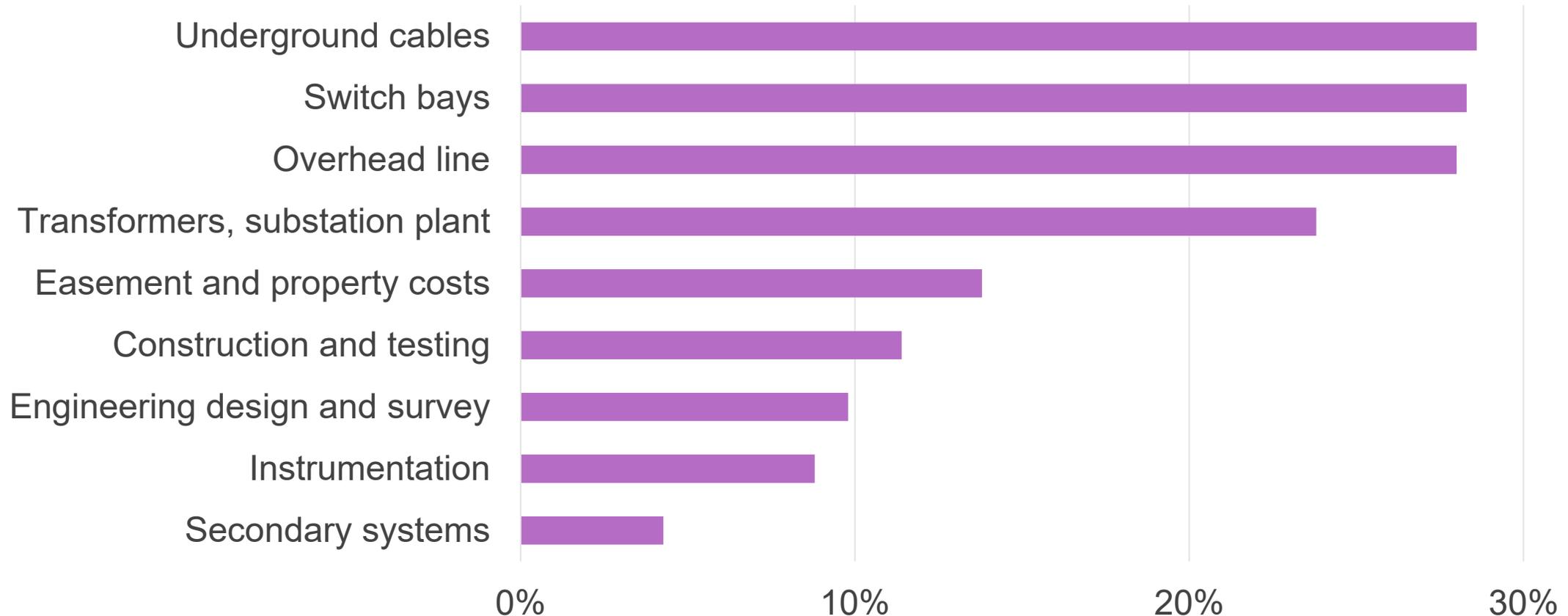
Final report and consideration of feedback

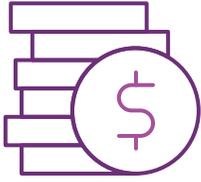




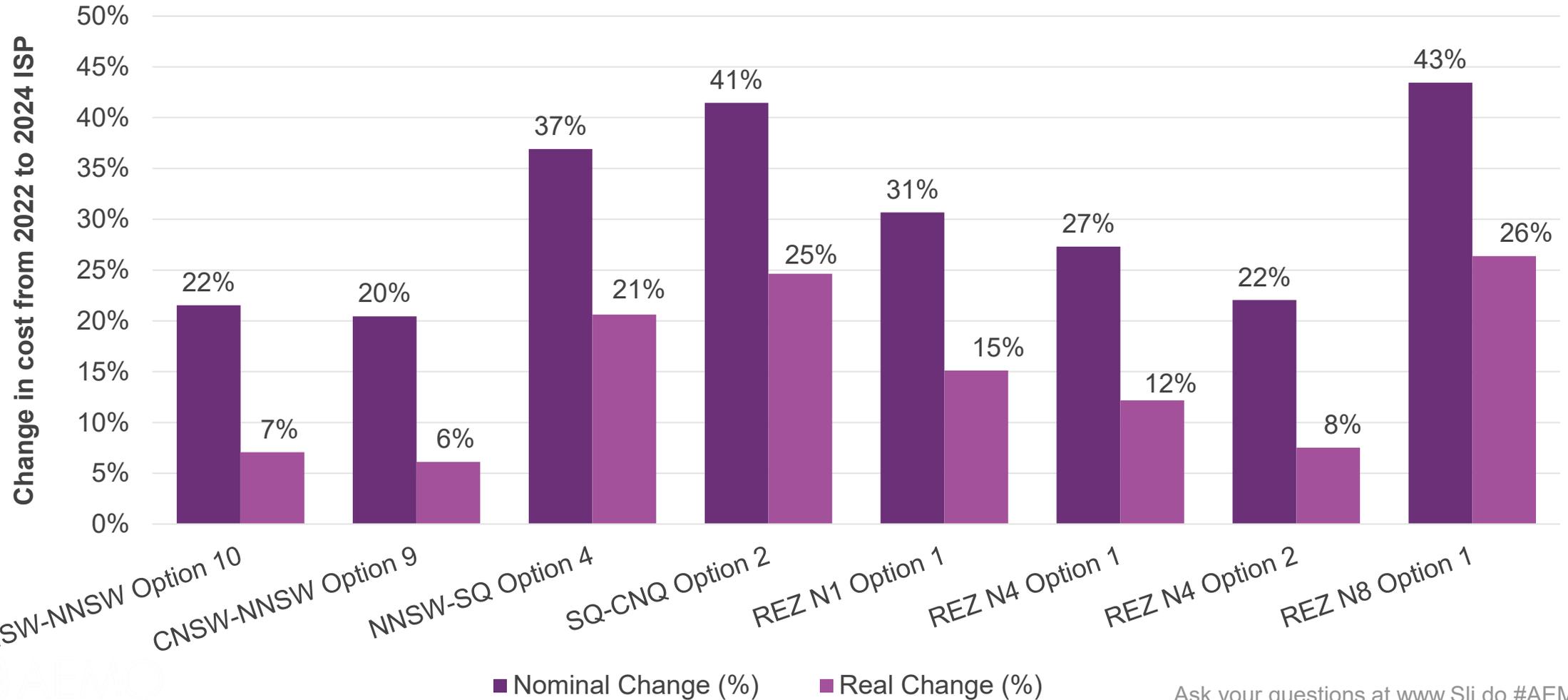
AEMO has updated its Transmission Cost Database using the latest market information

Cost database estimate increases from 2020 to 2022



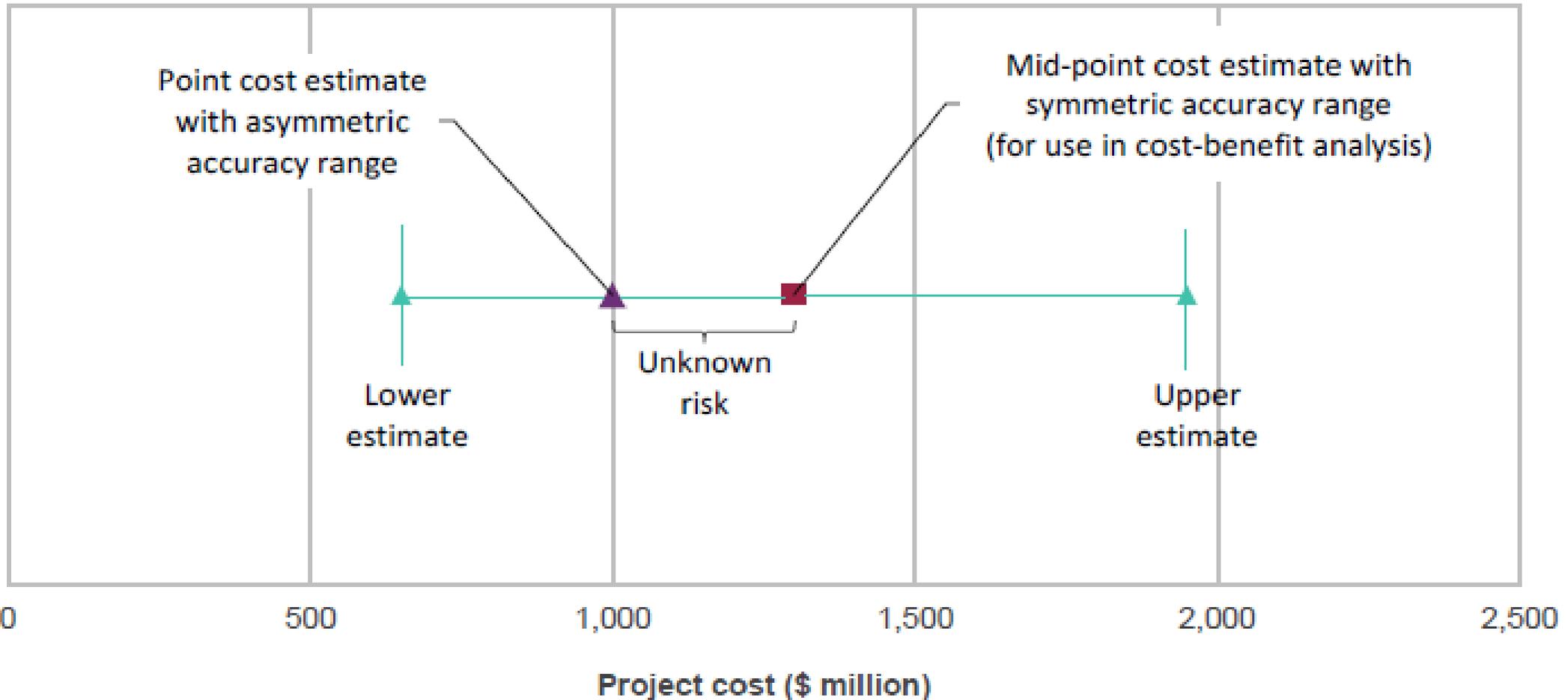


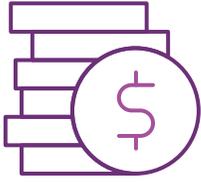
Up to 30% real cost increase seen when compared to estimates for the 2022 ISP



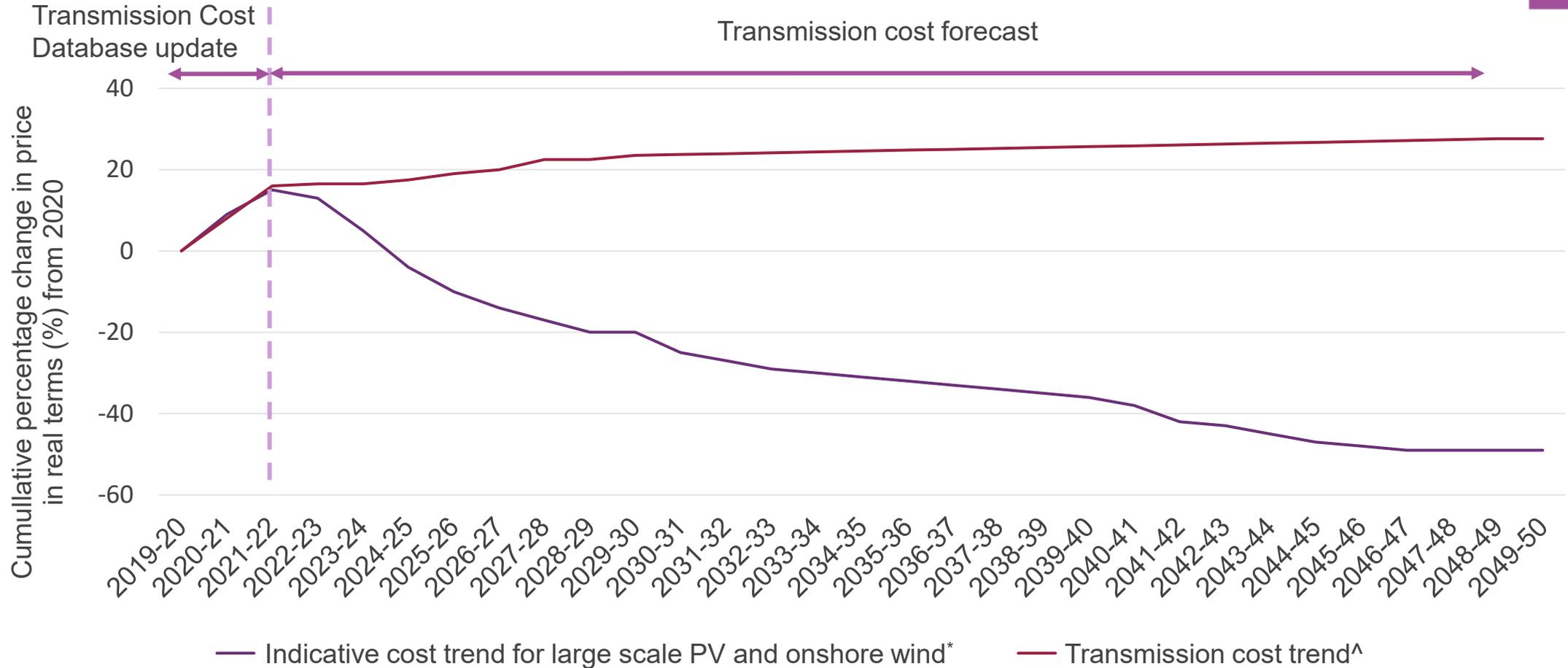


AEMO will retain its existing approach to cost estimate classes and accuracy ranges



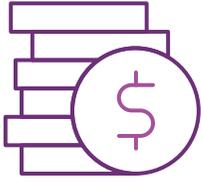


Different forecasting approaches are taken for transmission and generation costs



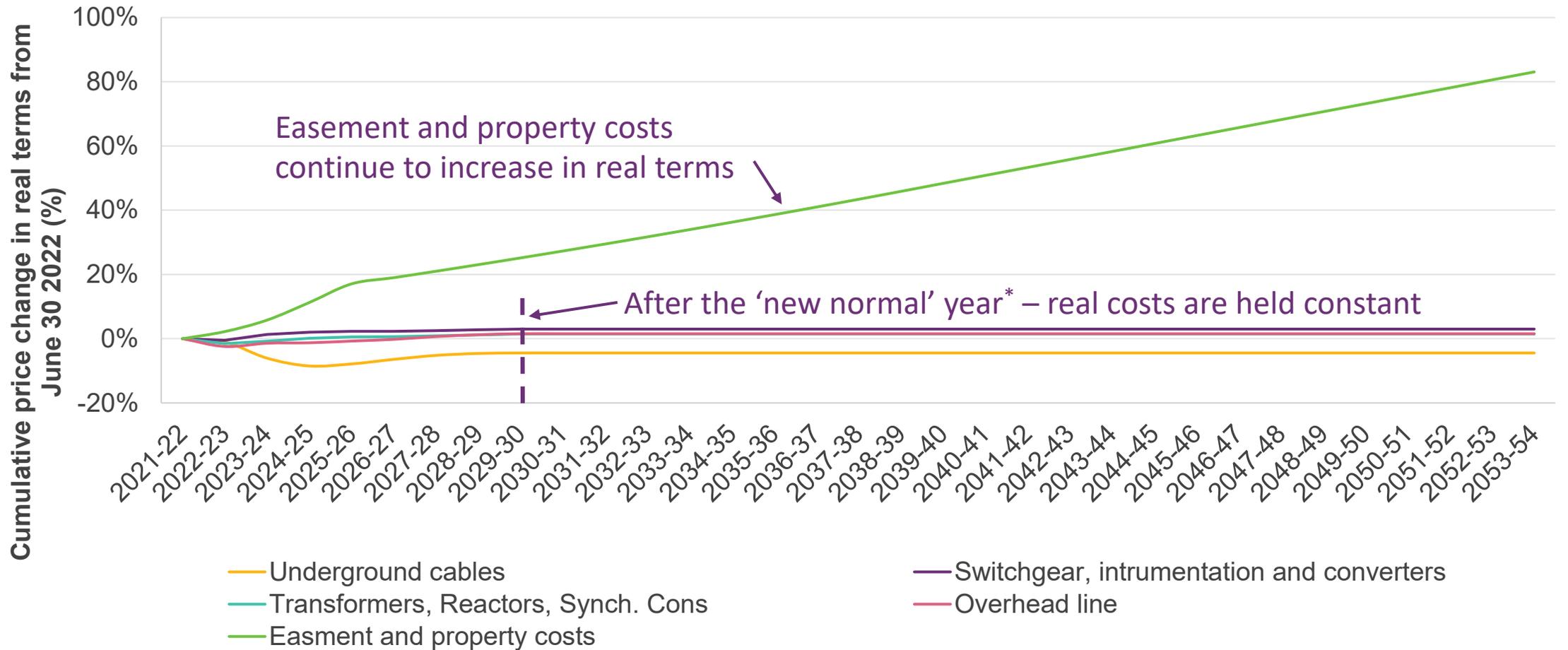
* Indicative trend determined from CSIRO's GenCost 2021-22 and GenCost 2022-23 reports

^ Transmission cost trend is based on the Transmission Cost Database update and the forecasts for the Step Change and Green Energy Exports scenarios

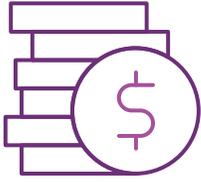


Escalation factors increasing real costs (1)

Underground cables; Overhead lines; Substation equipment;
Easement and property costs

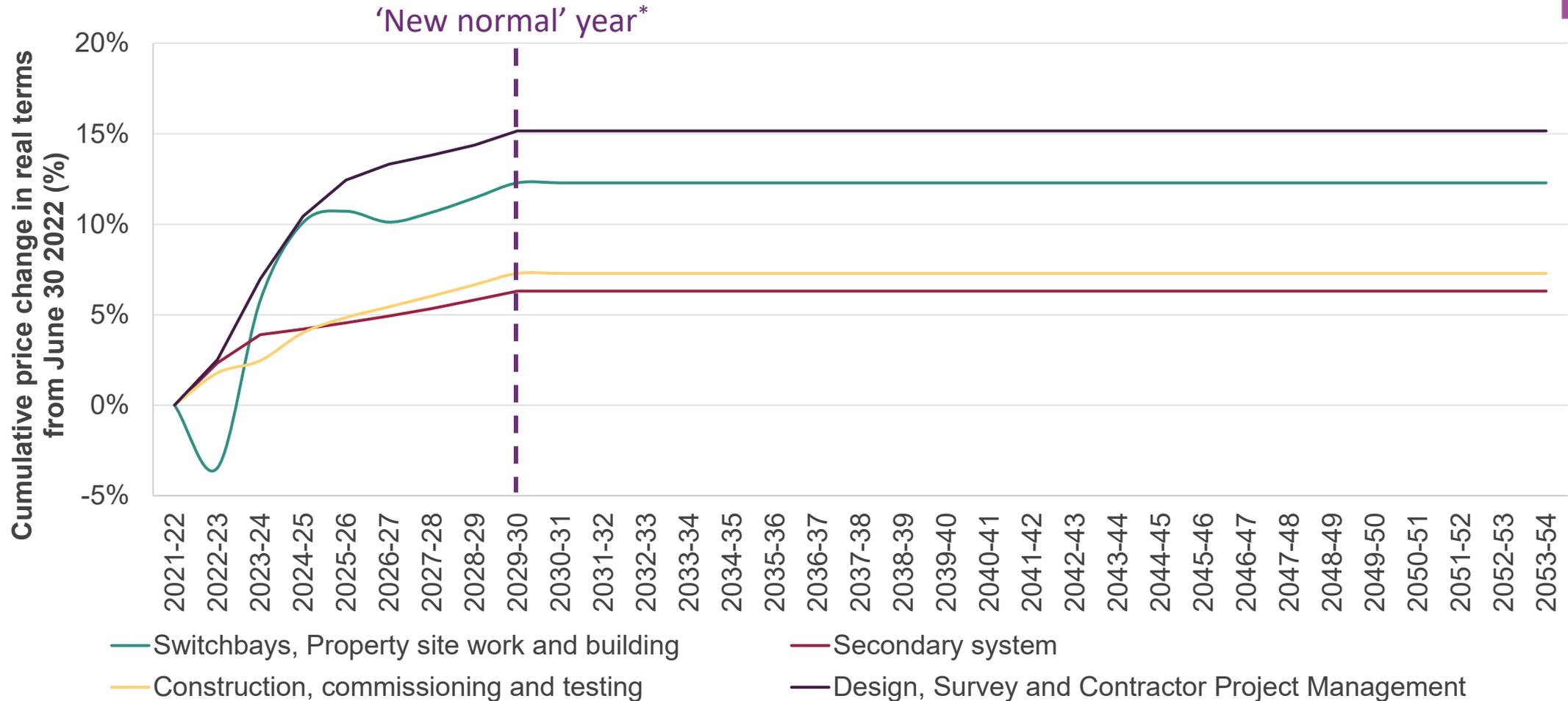


* New normal year for Step Change and Green Energy Exports IASR scenarios

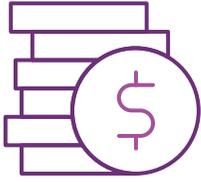


Escalation factors increasing real costs (2)

Construction, commissioning and testing; Design, survey and contractor project management; Site works; Secondary systems.

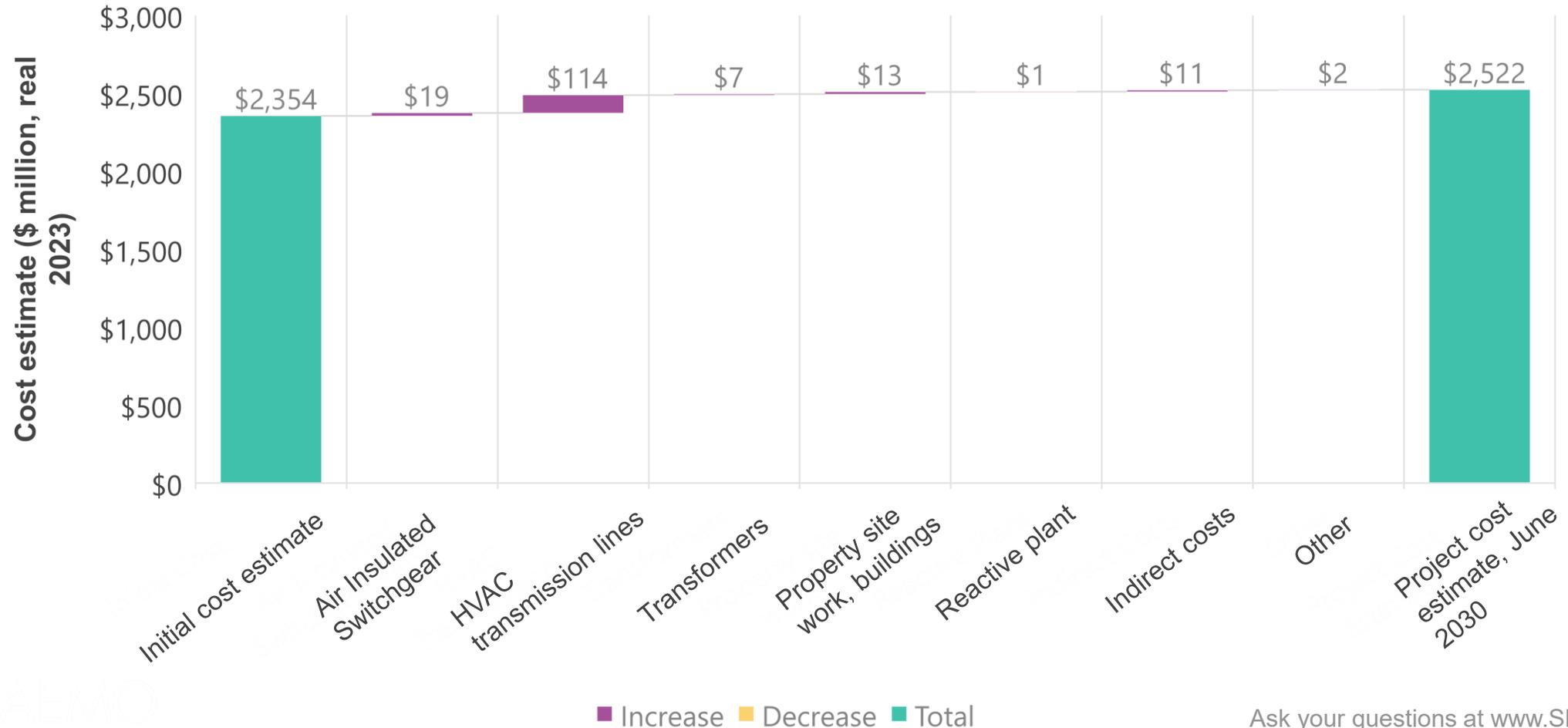


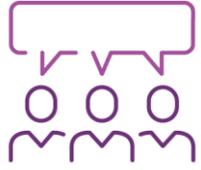
* New normal year for Step Change and Green Energy Exports IASR scenarios



A sample project is provided to show the impact of the new forecasting approach

Includes 3 x 500 kV substations, new double-circuit 500 kV lines, and supporting lower voltage network





Social licence is considered in this report, and throughout the ISP process

Stakeholder feedback

Explicit cost of social licence should be stated.

Need clearer communication about option compatibility.

Earlier engagement is needed, and better tools to understand land use.

There should be meaningful consideration of undergrounding of transmission lines in option analysis.



Decision (Added clarifications)

AEMO undertakes extensive joint planning with transmission networks and jurisdictional bodies.

This update includes incorporation of strategic land holder payments, escalation of land costs, and a new forecasting approach for biodiversity offsets.

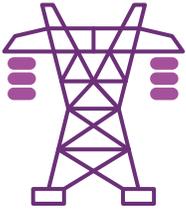
AEMO will include input and feedback from external stakeholders in the ISP process.

AEMO recognises that undergrounding of transmission lines is an important issue currently being explored in several jurisdictions, by transmission networks, and through the Energy Charter.

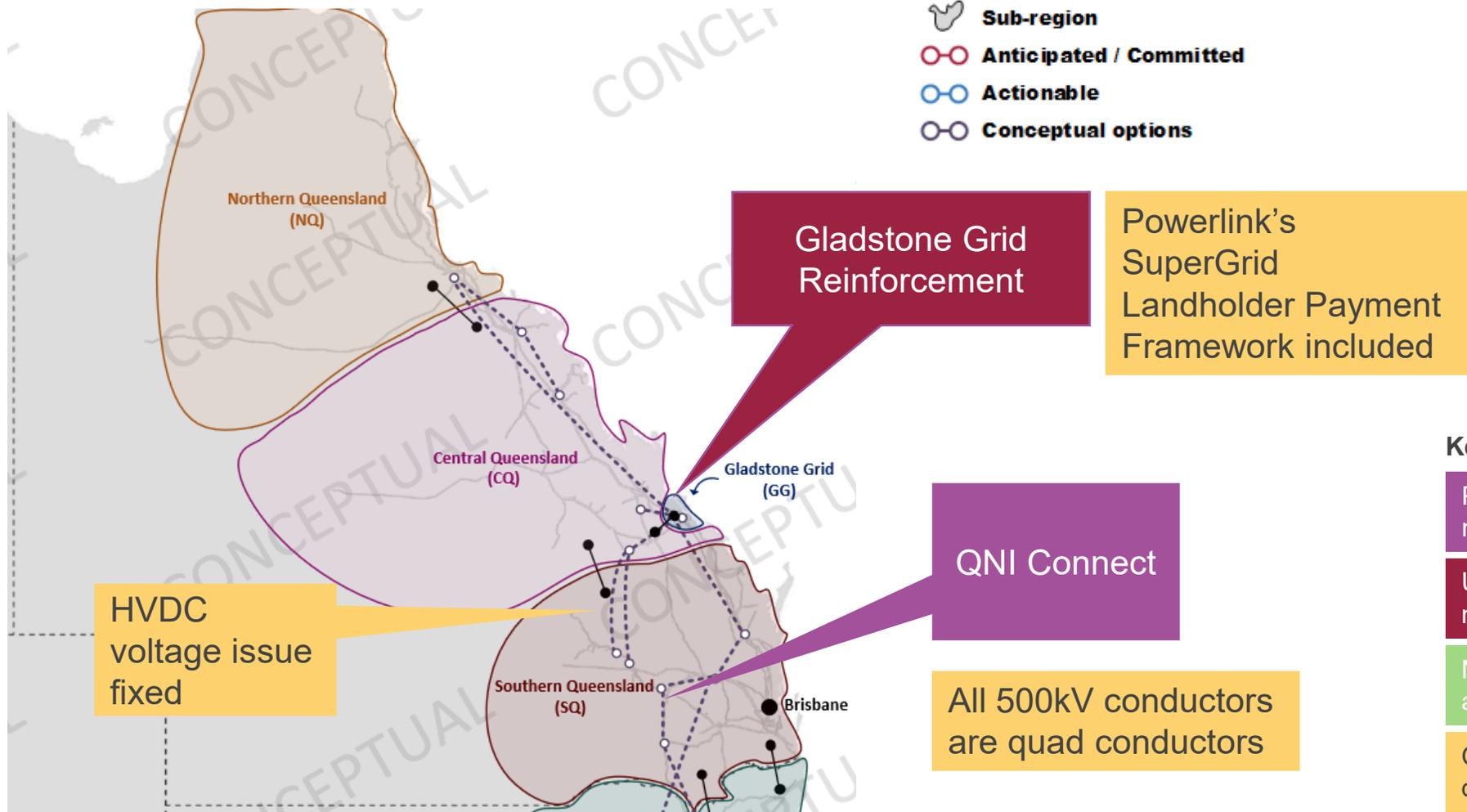
The updated database now accounts for double circuit underground cables, to allow for like-for-like comparisons with overhead lines.

Flow paths and renewable energy zones (REZs)

- **Flow paths** transport significant amounts of electricity across the backbone of the network.
- **REZs** are high-quality resource areas where clusters of large-scale renewable energy projects can be developed using economies of scale.

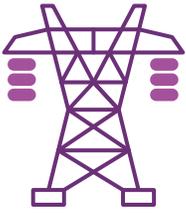


Flow paths for Queensland

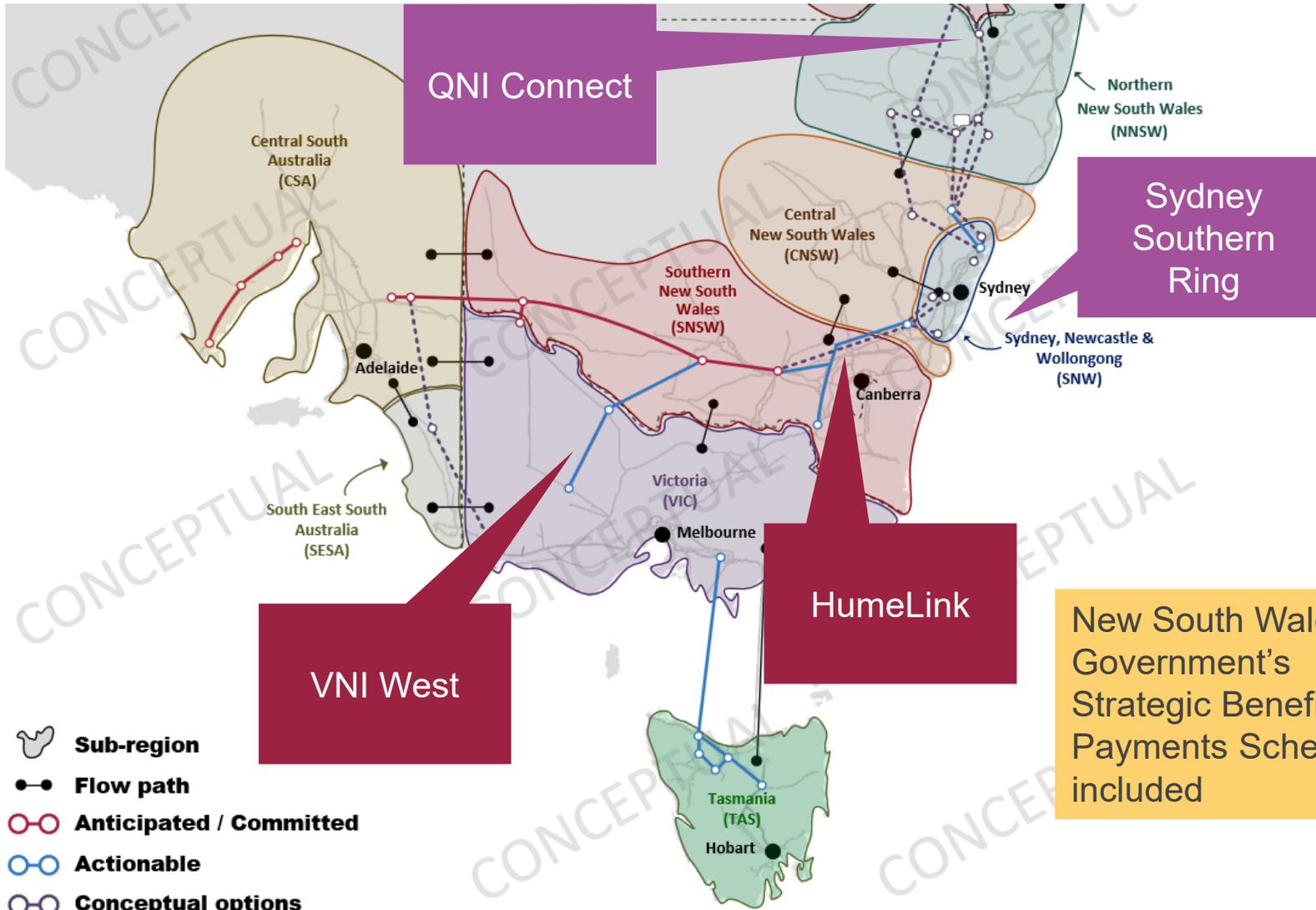


Key:

- Preparatory activity from network or jurisdictional body
- Updated cost and scope from network or jurisdictional body
- Newly committed or anticipated project
- Other changes made from draft



Flow paths for New South Wales, Victoria, South Australia and Tasmania



Key:

Preparatory activity from network or jurisdictional body

Updated cost and scope from network or jurisdictional body

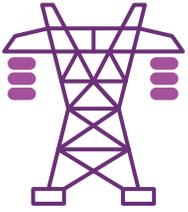
Newly committed or anticipated project

Other changes made from draft

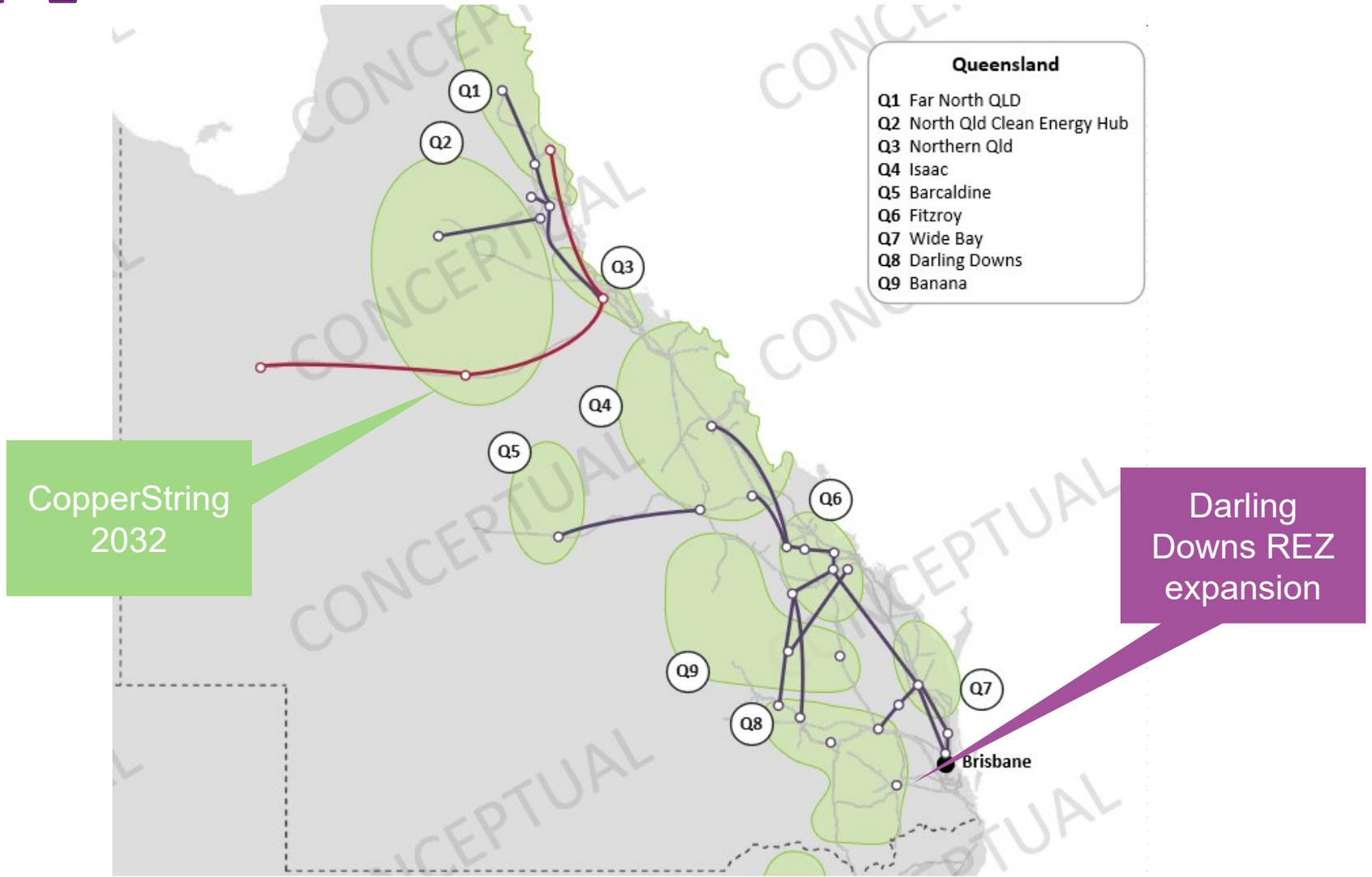
New South Wales Government's Strategic Benefit Payments Scheme included

Victorian Government's landholder payment announcement included

- Sub-region
- Flow path
- Anticipated / Committed
- Actionable
- Conceptual options

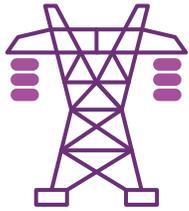


Queensland REZs

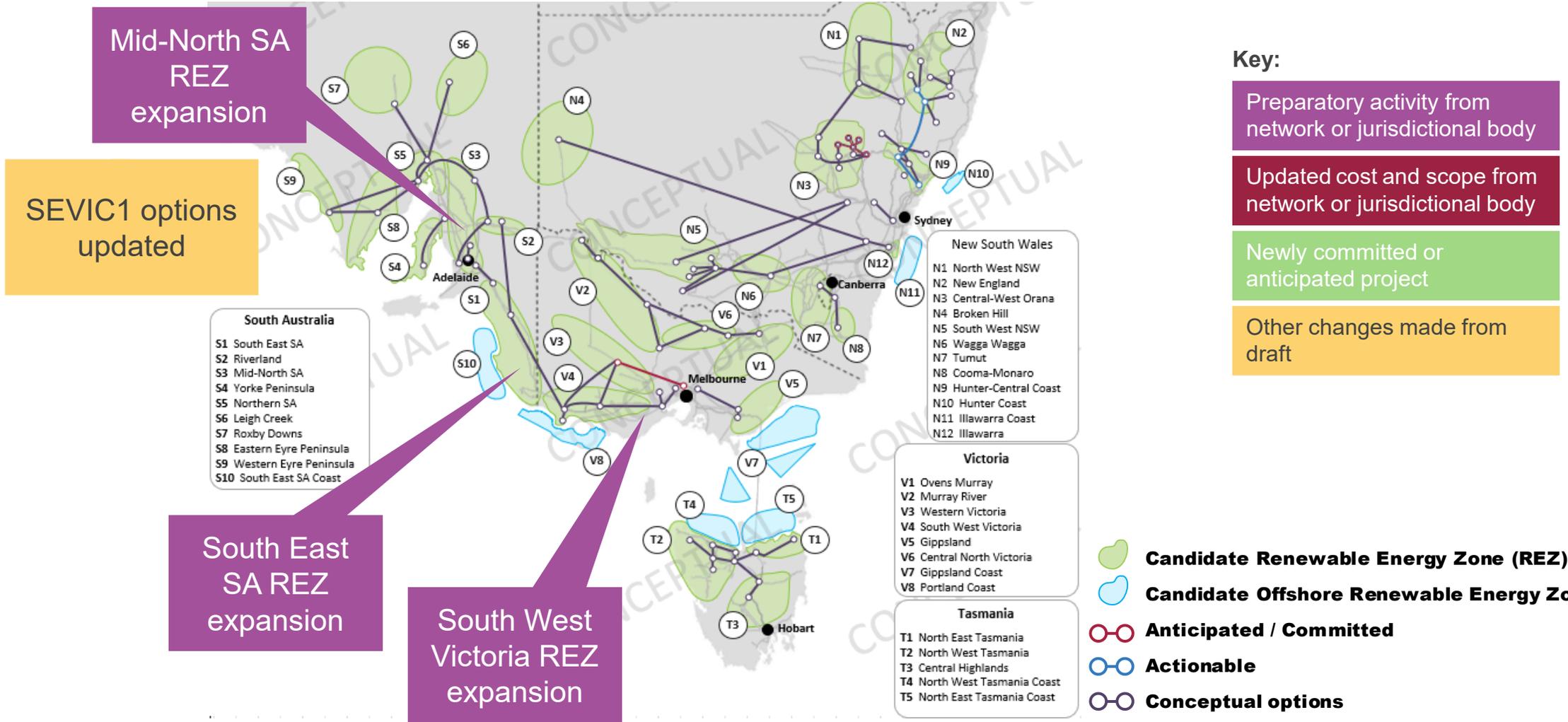


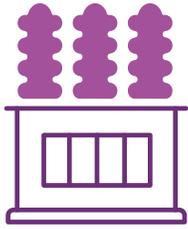
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New South Wales, Victoria, South Australia and Tasmania REZs





Operating expenditure is estimated at 1% of capital expenditure per annum

Stakeholder feedback

Better justification of operating expenditure assumptions is needed.



Decision (Added clarifications)

AEMO has tested the 1% value against revenue reviews and determinations.

Both ElectraNet and Transgrid's recent determinations yield approximately 1% of the total capital cost per annum, although they vary slightly by network and by project.

AEMO considers that a 1% value is an appropriate estimate for the purposes of the ISP, and has added explanatory material in the consultation summary report.



AEMO calls for non-network options through the Draft IASR and Draft ISP consultations

Stakeholder feedback

AEMO needs better processes for the inclusion of non-network options in the ISP.

AEMO should consider an option for a virtual transmission line connection for the Victoria to South East South Australia flow path.

AEMO and transmission networks should promote more market-led development of transmission options.



Decision (Added clarifications)

AEMO called for non-network options for the Draft 2023 IASR, and will welcome non-network option proposals in response to the Draft 2024 ISP.

After actionable ISP projects are identified, AEMO is obliged to publish a notice in the Draft ISP requesting submissions for non-network options that are able to sufficiently meet the identified need that the actionable ISP project would address.



AEMO has responded to a number of other matters raised in stakeholder submissions

Co-optimising REZ and flow path assessment

Clarity about project lead time delay treatment

Engagement on generation and consumer energy resource options

REZ transmission asset treatment as dedicated connection assets

Clarity about jurisdictional policy alignment or overlap

Call for the Sydney Southern Ring project to proceed

Call for efficiencies in transmission regulatory approval processes

Use of multi-criteria analysis for option selection

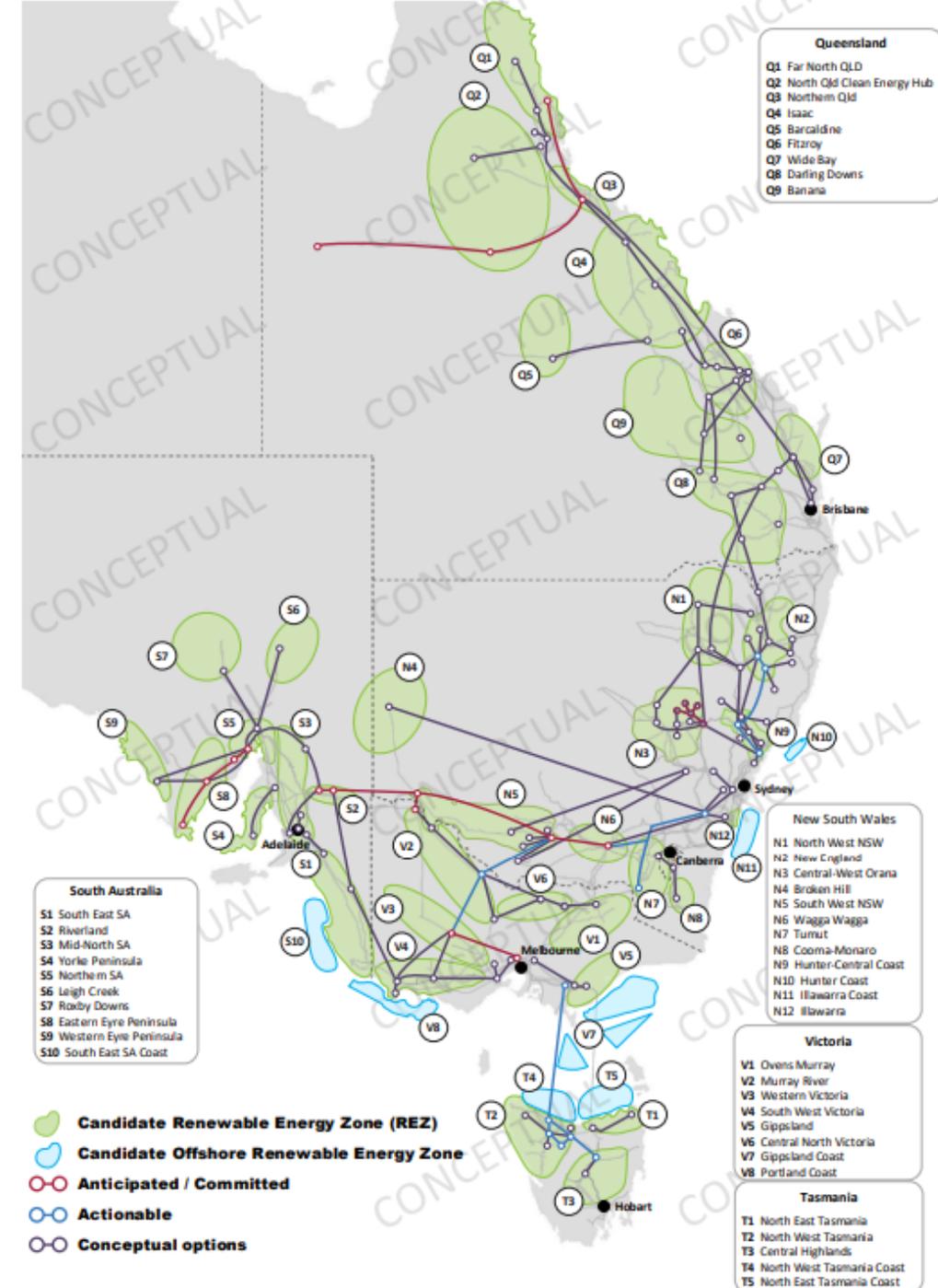
Clarification of underground cable cost multiplier

Call for network expansion to support new loads

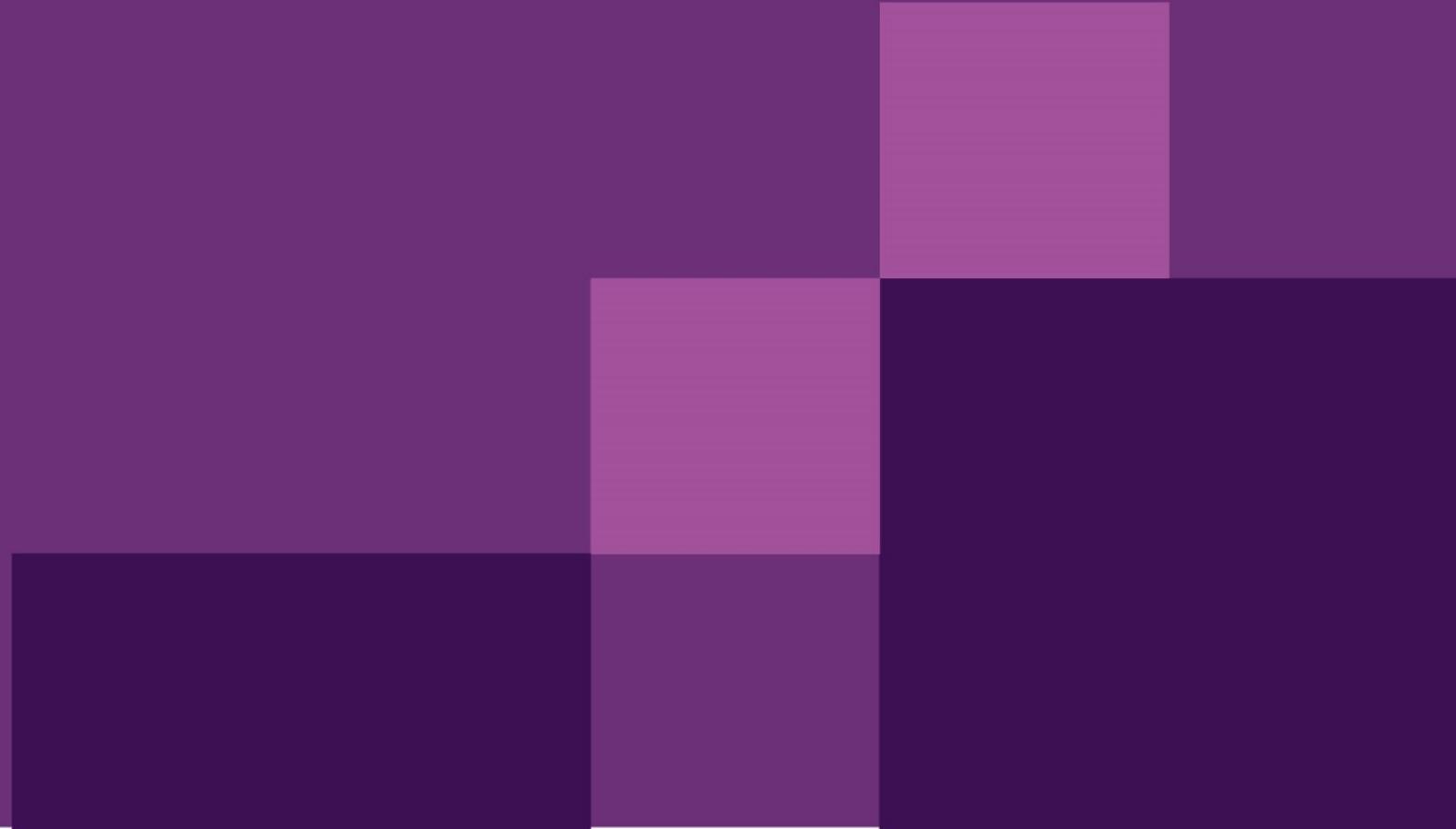
Noting different lead times for underground and overhead transmission projects

Stakeholder feedback and extensive joint planning with networks has strengthened the final Transmission Expansion Options Report

- Extensive advice from transmission networks and jurisdictional bodies.
- More than twenty stakeholder submissions.
- Updated cost estimates to incorporate recent market changes, and new cost forecasting approach across the ISP horizon.
- More than 120 augmentation options for flow paths and REZs.



Questions, comments and next steps





Questions and comments

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Sign in with your name

Next steps



- Please [provide feedback](#) on today's webinar.
- The Draft 2024 ISP will be released for consultation mid December 2023.
- Join the 2024 ISP mailing list: [subscribe](#)
- Please email: ISP@AEMO.com.au if you have any questions.



For more information visit

aemo.com.au