Draft
2022 Integrated System Plan

AEMO Consumer Forum – 15 December 2021

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Contents

1. The ISP – Purpose and process
2. Draft 2022 ISP – Key findings
3. Consultation on the Draft ISP
4. Questions

The ISP – Purpose and process

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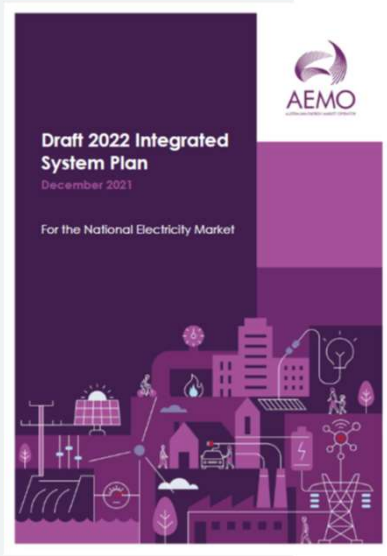
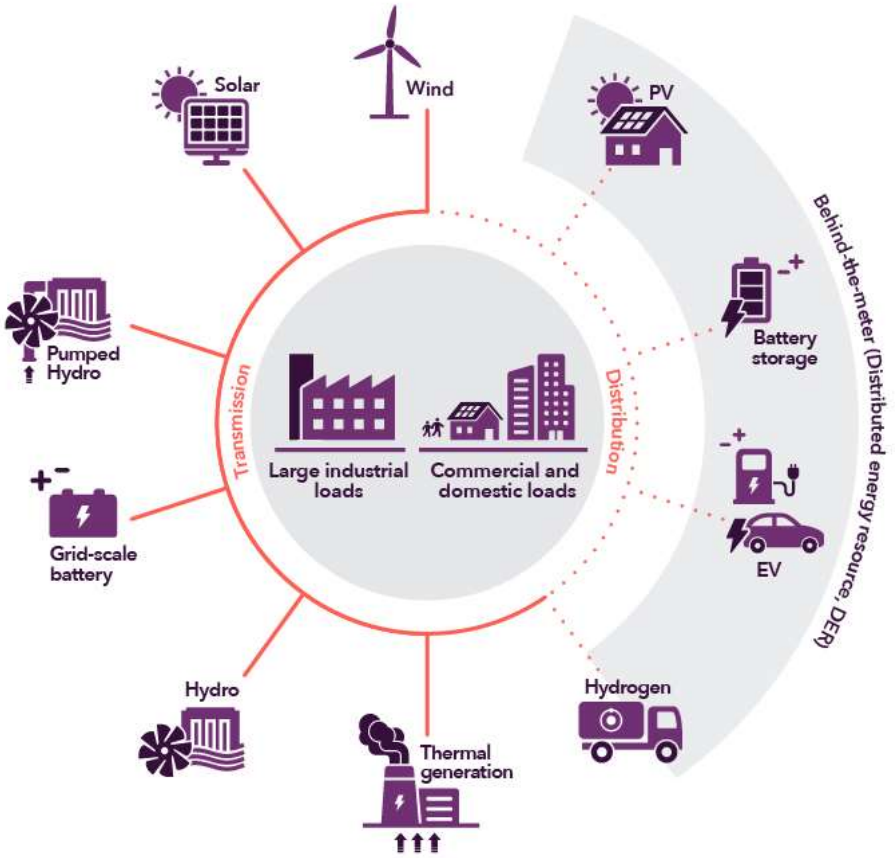
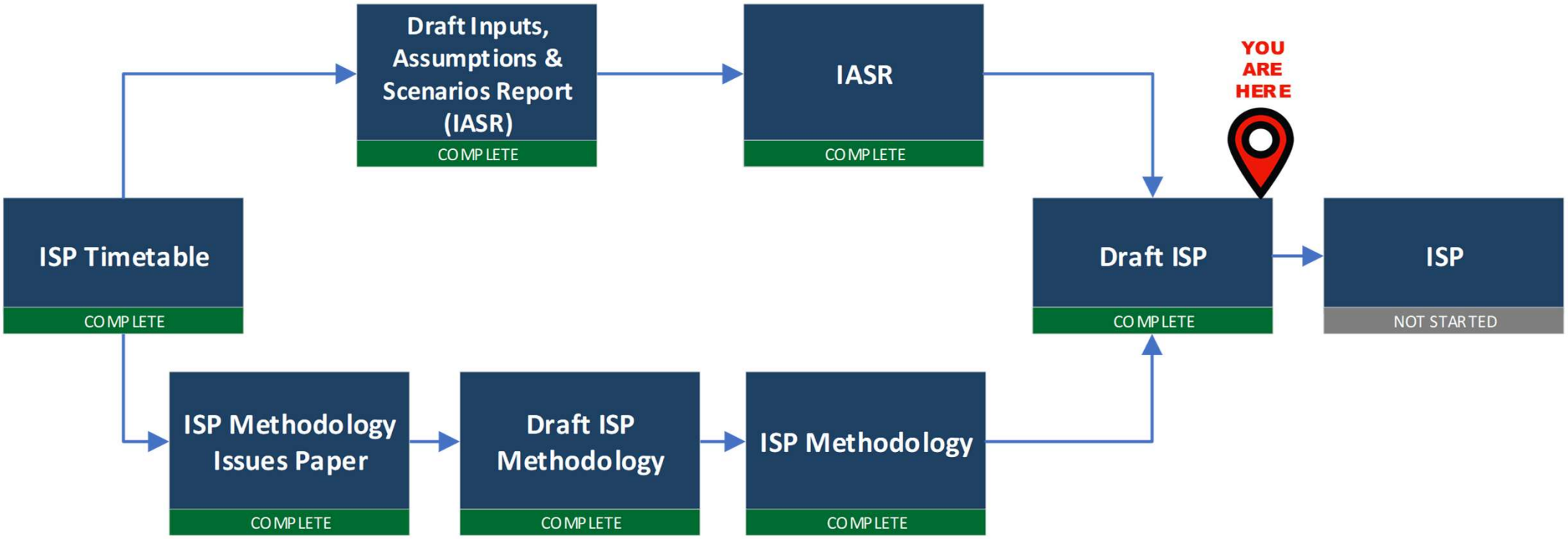
About the Integrated System Plan (ISP)





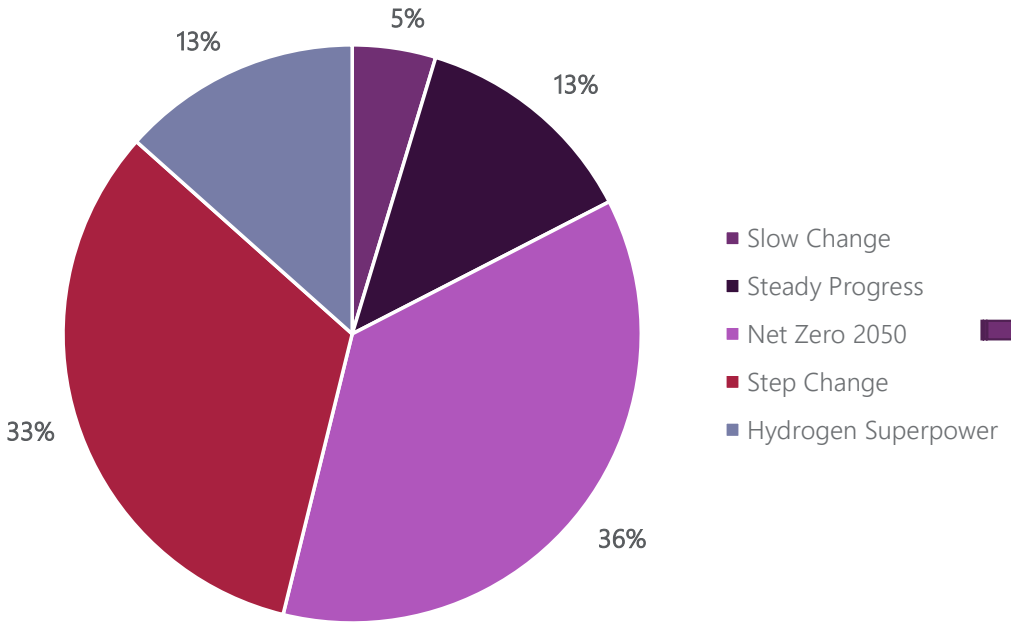
- **Whole-of-system** plan
- Informs policy makers, investors, consumers, researchers and other energy stakeholders
- Serves regulatory purpose of justifying actionable and future new transmission
- Maximises value to end consumers
- Optimal development plan/roadmap

The ISP development process

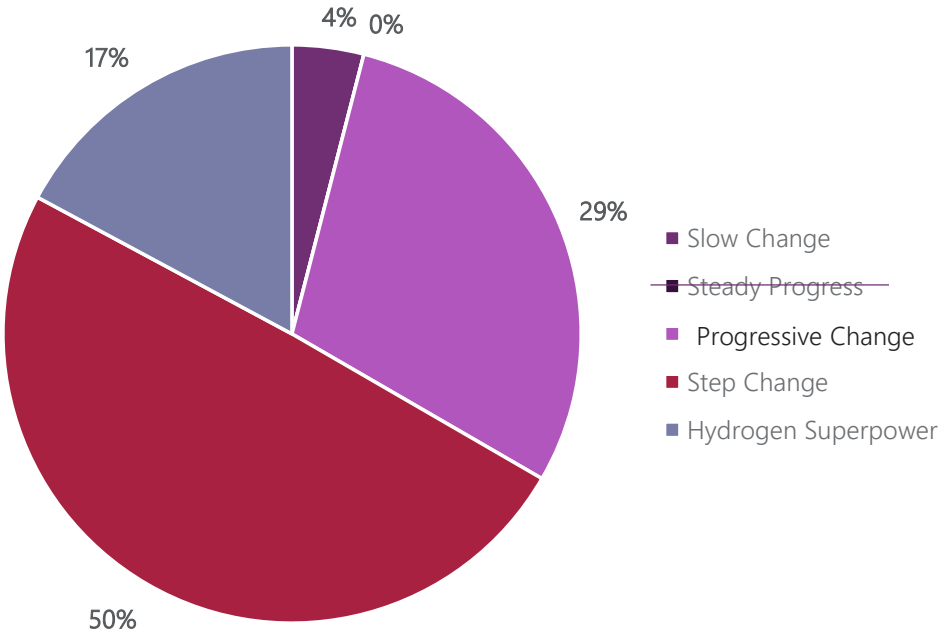


Since COP26, Delphi Panel now favours Step Change

- Delphi Panel 1: 5 scenarios



- Delphi Panel 2: 4 scenarios



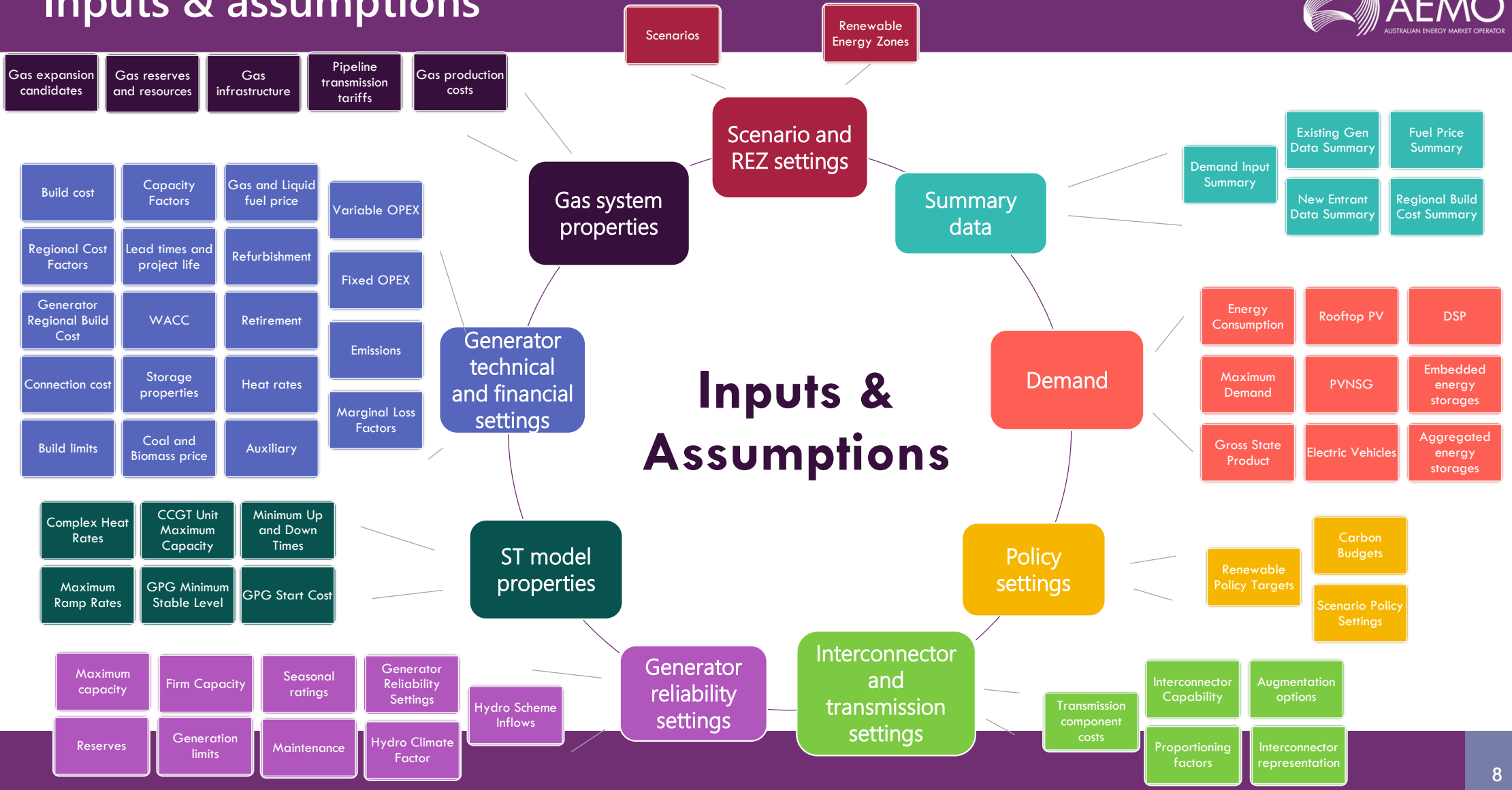
Net Zero 2050 name changed to "Progressive Change"

Scenarios

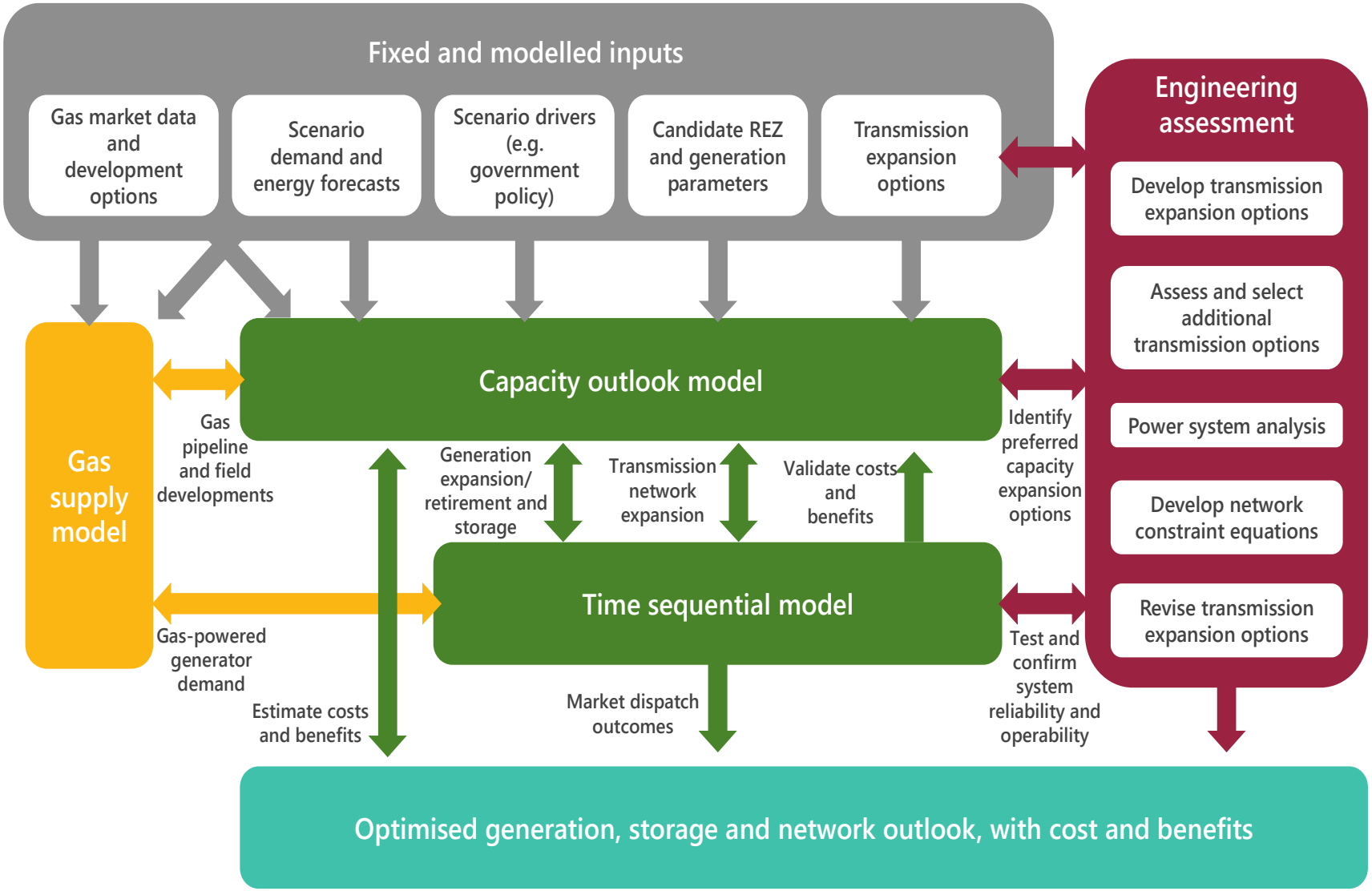
DEMAND	Slow Change		Progressive Change		Step Change		Hydrogen Superpower	
Electrification	2030	2050	2030	2050	2030	2050	2030	2050
- Road transport that is EV (%)	2	36	5	84	12	99	18	94
- Residential EVs still relying on convenience charging (%)	82	58	75	44	70	31	66	22
- Industrial Electrification (TWh)	-24	-21	4	92	27	54	37	64
- Residential Electrification (TWh)	0	0	0.2	15	4	13	2	4
- Energy efficiency savings (TWh)	8	19	14	40	22	55	22	56
Underlying Consumption								
- NEM Underlying Consumption (TWh)	163	213	201	394	222	336	243	330
- Hydrogen consumption - domestic (TWh)	0	0	0	32	0.1	58	2	132
- Hydrogen consumption - export, incl. green steel (TWh)	0	0	0	0	0	0	49	816
- Total underlying consumption (TWh)	**163**	**213**	**201**	**425**	**223**	**394**	**294**	**1,278**
SUPPLY								
Distributed PV Generation (TWh)	39	58	39	80	45	93	51	112
Household daily consumption potential stored in batteries (%)	3	5	5	22	12	38	13	39
Underlying consumption met by DER (%)	24	27	20	19	20	24	17	9
Coal generation (% of total electricity production)	34	5	38	2	21	0	6	0
NEM emissions (MT CO_2-e)	57.4	12.1	77.8	23.6	48.3	7.2	19.0	5.6
2020 NEM emissions (% of)	40	9	55	17	34	5	13	4

Level of change

Inputs & assumptions



Methodology



Draft 2022 ISP – Key Findings

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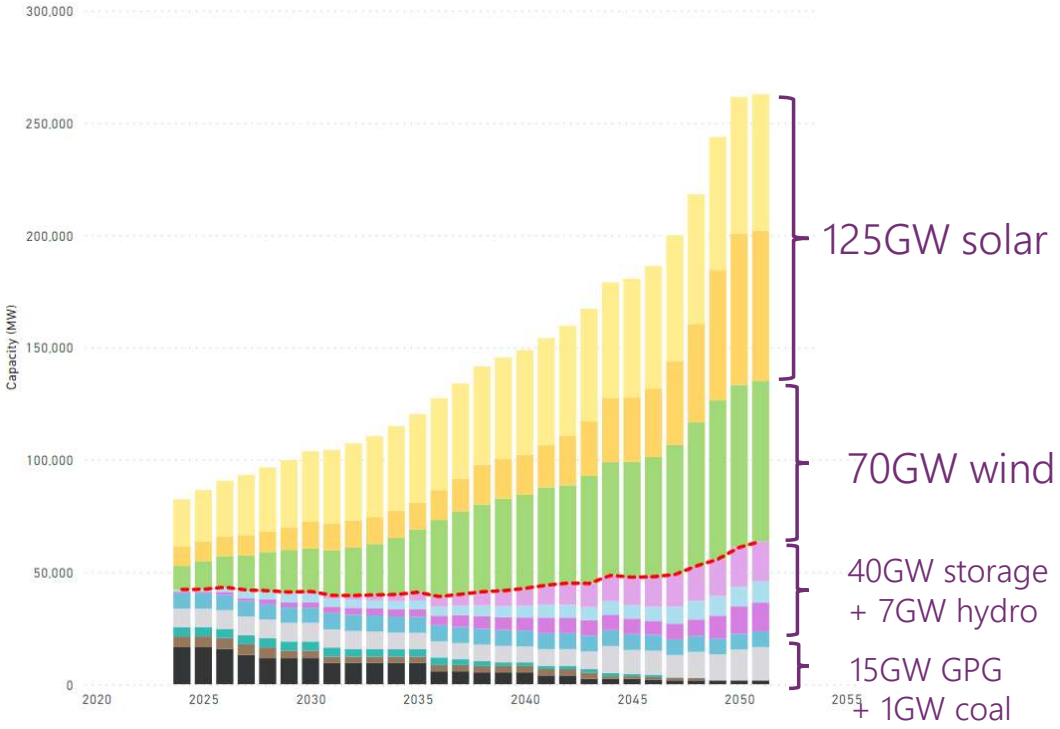
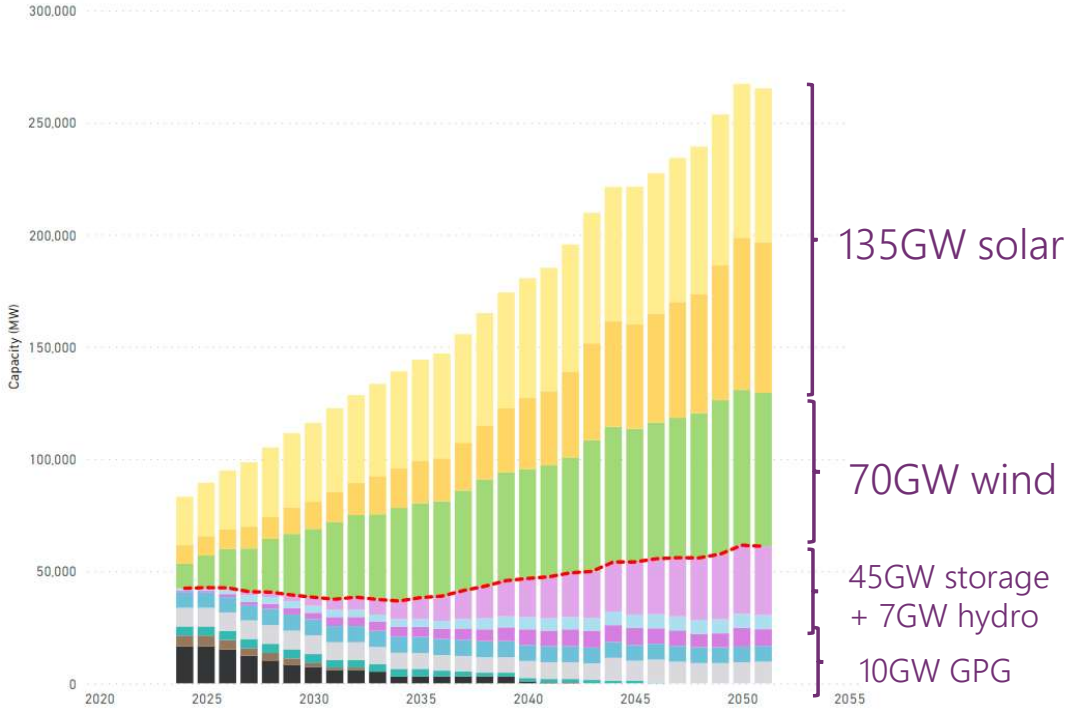
Renewable generation capacity to at least double every decade from now to 2050 …

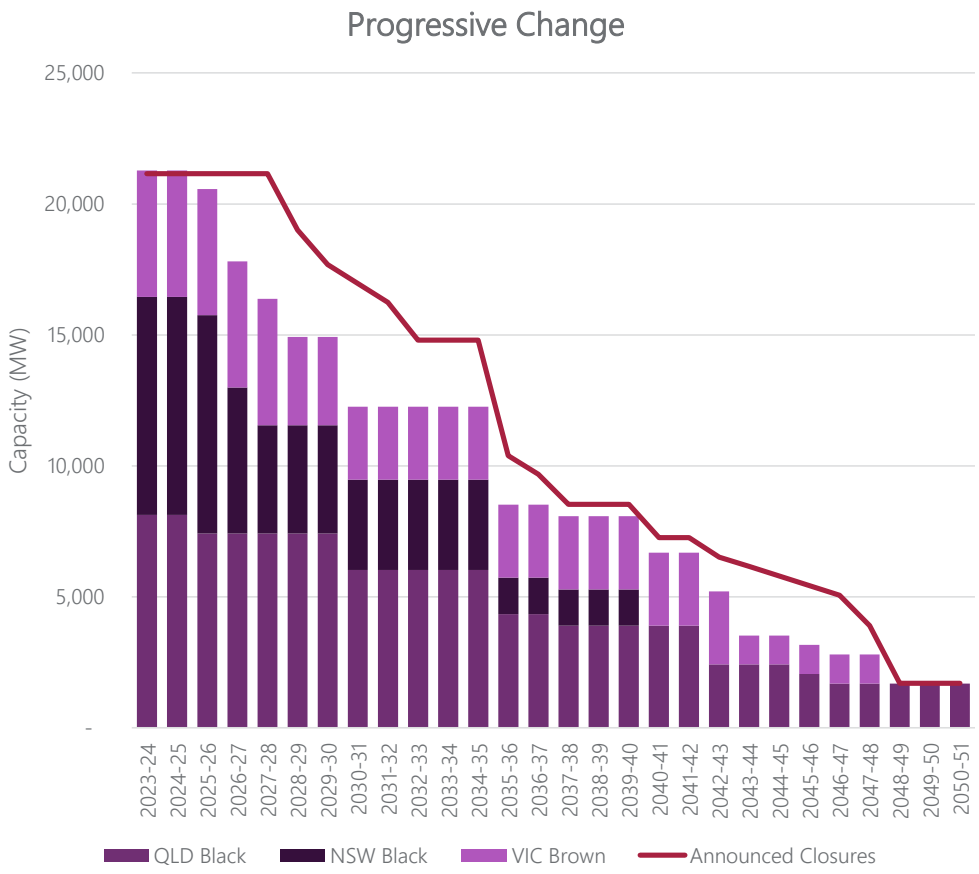
Progressive Change – with transmission

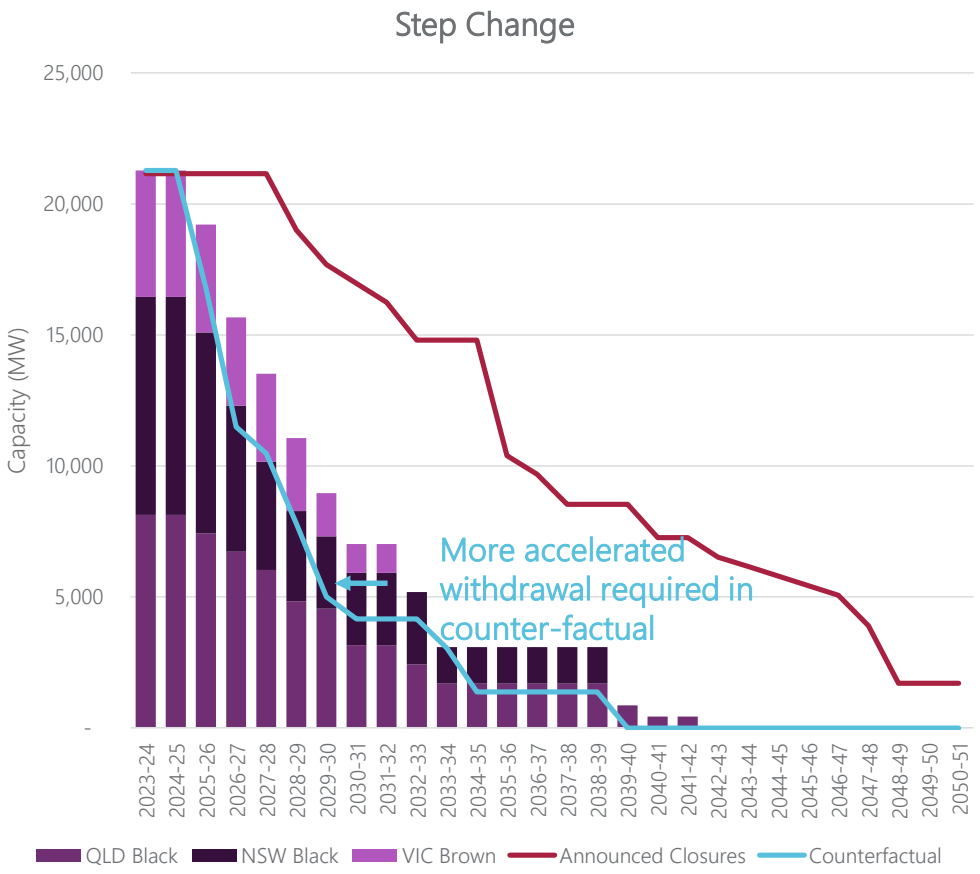


Step Change – with transmission



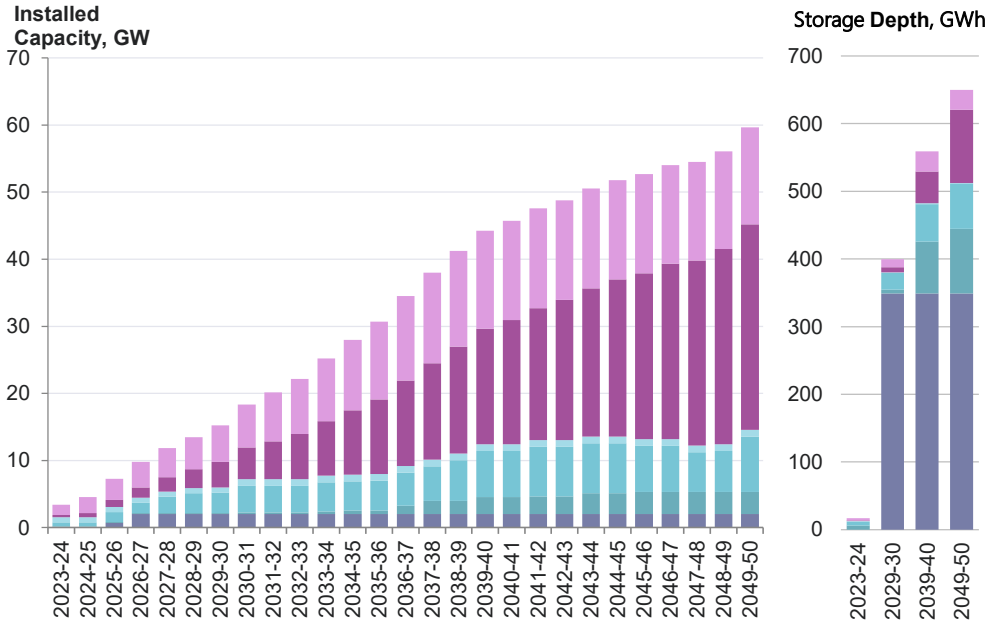
...coal likely to withdraw much sooner than expected...

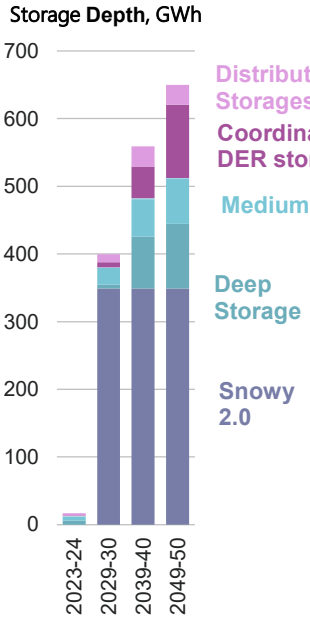




..requiring substantial storage and gas to firm renewables...

New storage of all depths needed





Distributed Storages

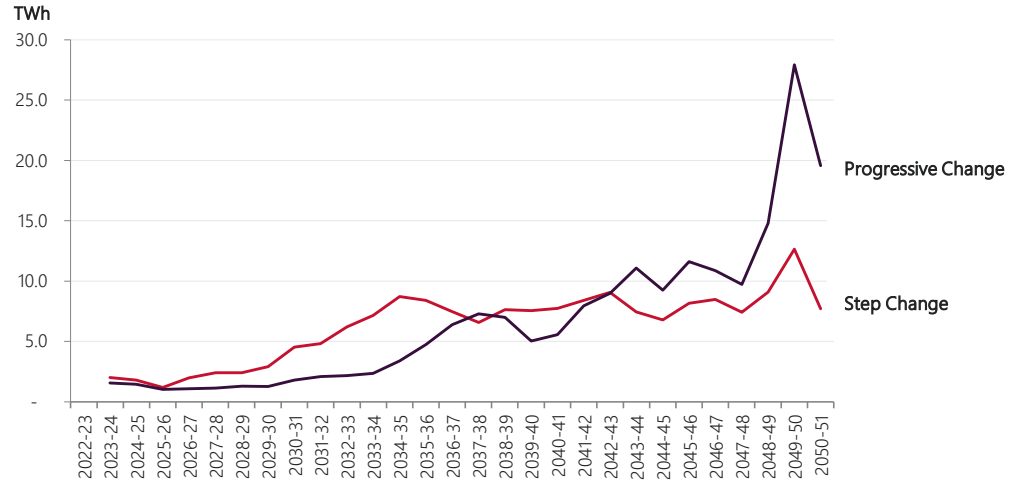
Coordinated DER storages

Medium Storage

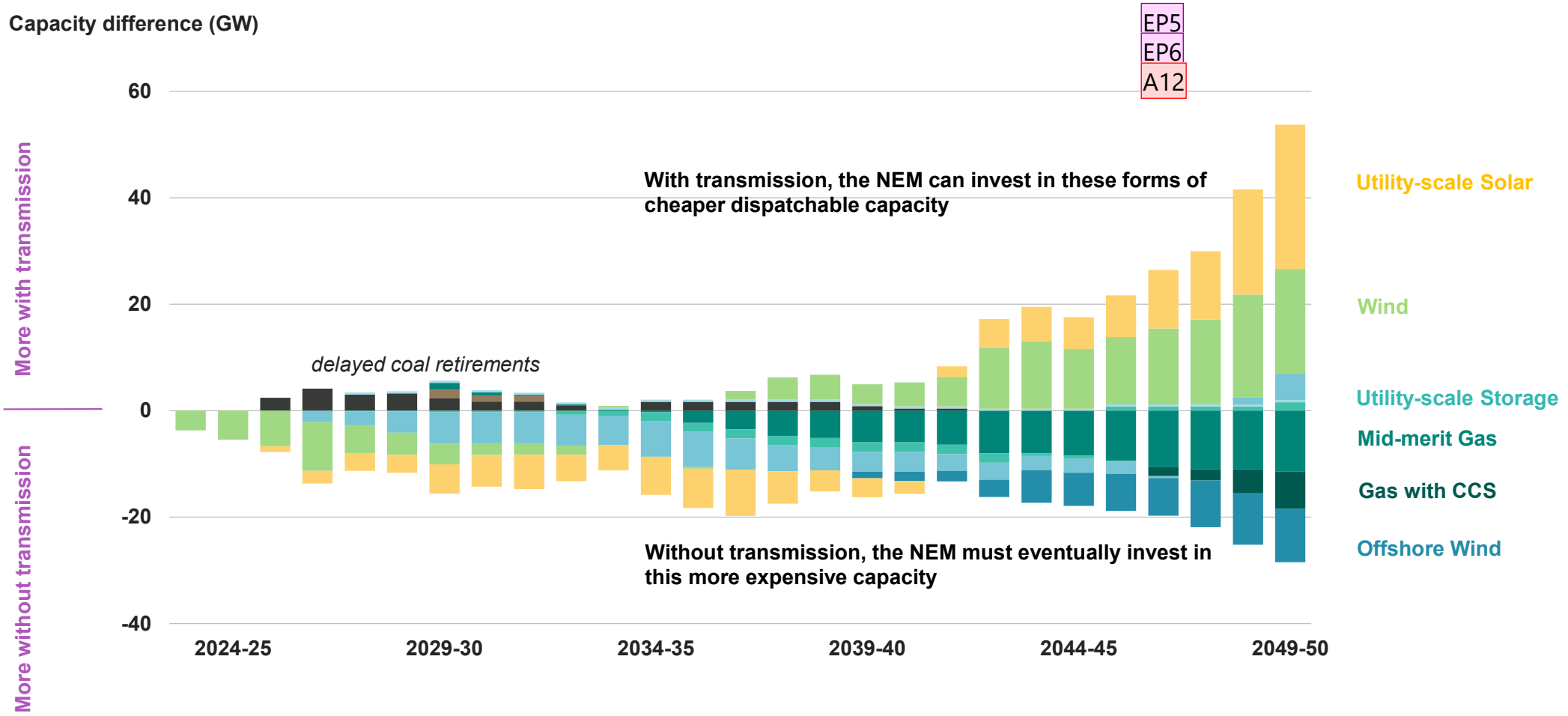
Deep Storage

Snowy 2.0

gas operation increases as VRE penetration increases



Without transmission, more gas, storage and off-shore wind is required to meet same carbon budgets



Slide 14

EP5 [@Andrew Turley] - Just a reminder - I believe you are intending to replace this with a version that has a better aspect ratio.
Elijah Pack, 9/12/2021

EP6 I had a go stretching things - up to you.
Elijah Pack, 9/12/2021

A12 Yep - put in the version that we put into the report
Andrew, 10/12/2021

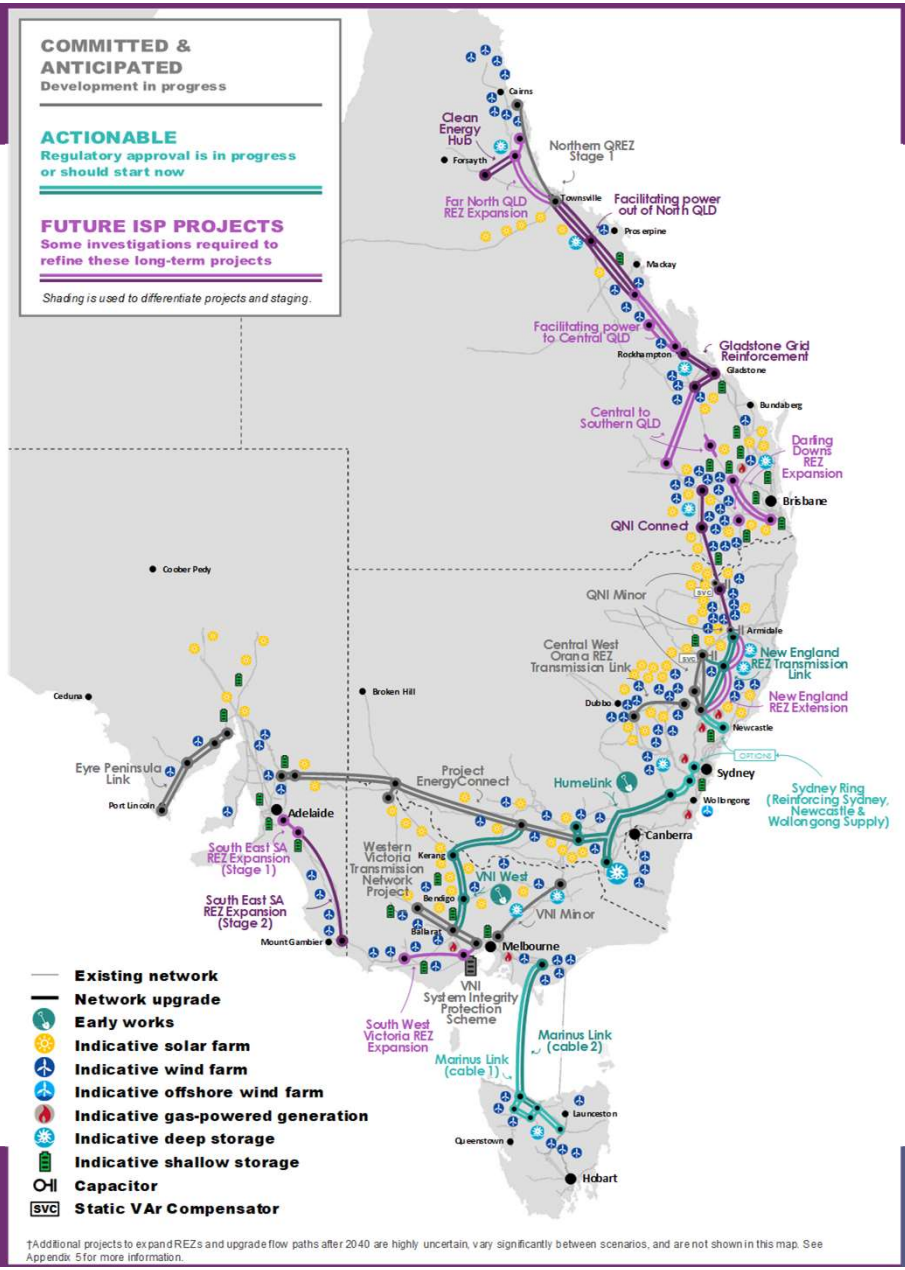
The draft optimal development path enables an efficient transition

The draft optimal development path (ODP) delivers ≈**$29 billion** in net market benefits

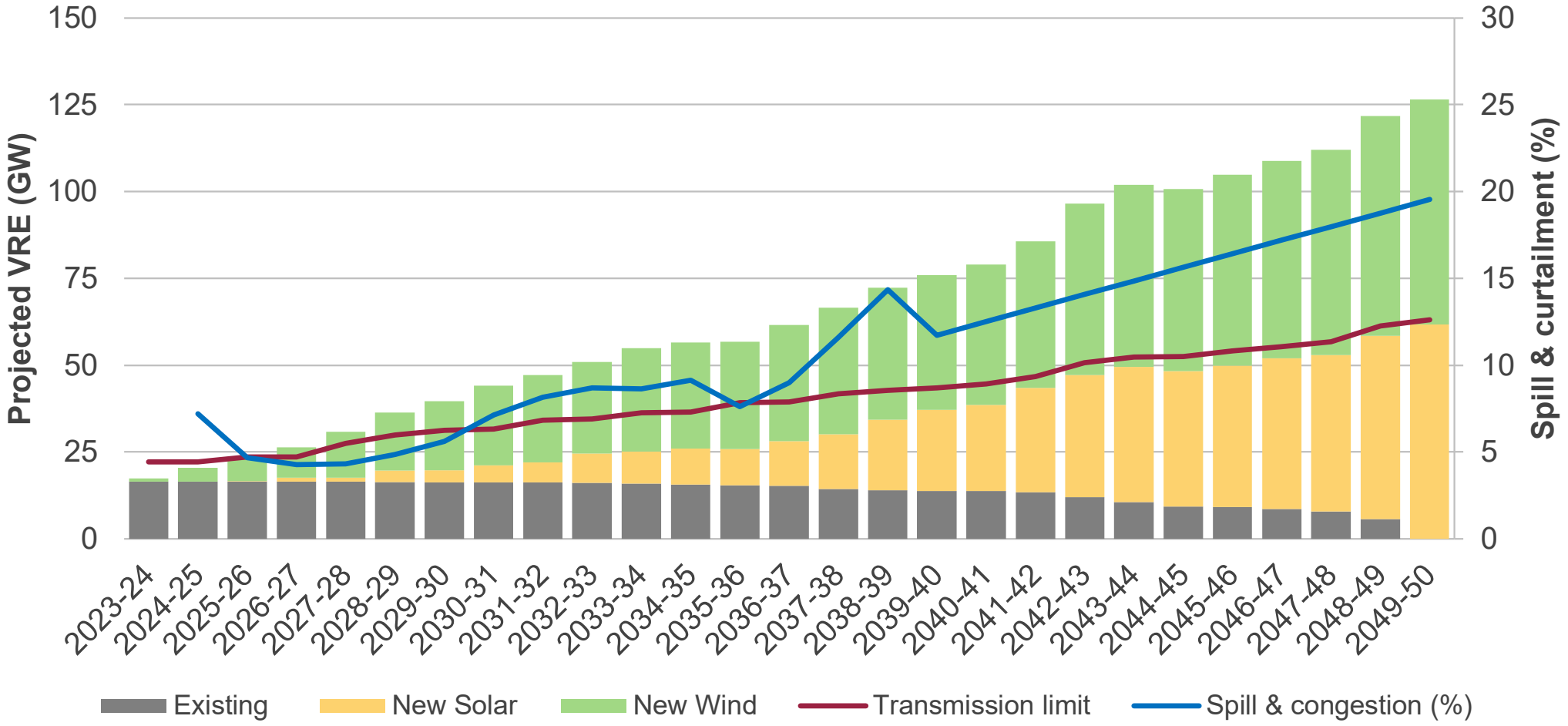
Retains flexibility to facilitate a **faster NEM decarbonisation by 2030** if desired

Helps **mitigate risk** of earlier than expected coal closures, or schedule slippage

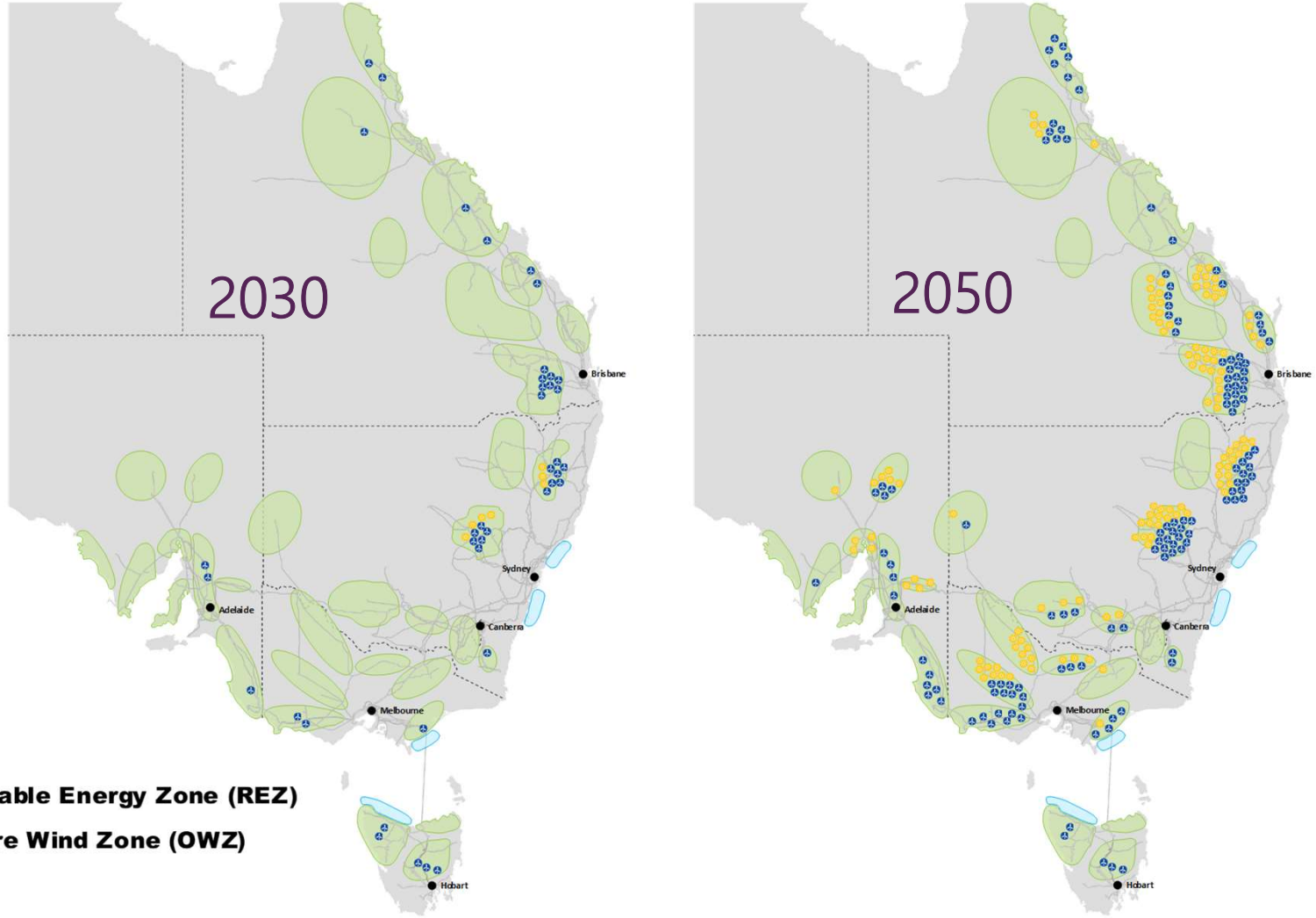
This optionality comes at almost **no cost to consumers ($20 million)**



...this efficient transition will have network congestion...



...Renewable Energy Zones will present a tremendous opportunity

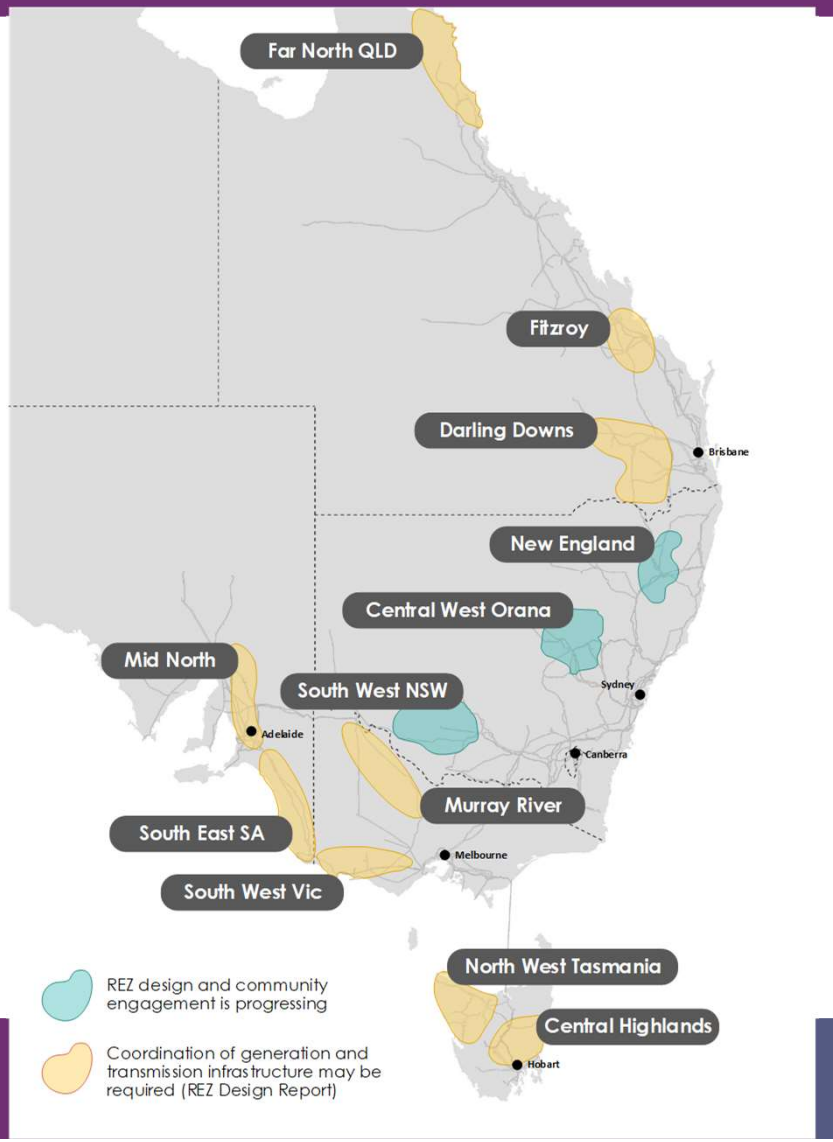


… but the social and economic barriers must be considered

The final ISP can trigger REZ Design Reports for REZs that require coordination of generation and transmission investment within 12 years. This is a significant investigation that involves:

- Engineering designs, cost estimates and easement investigations that considers developer and community interest.
- Stages that can be delivered to meet capacity targets in the ISP.
- Identification of barriers to community acceptance and estimates of costs associated with overcoming them.
- A draft report and a 6 week consultation

Substantially expanded community engagement programs are needed to explore the social licence for both generation and transmission investments.



Mitigating risks for consumers

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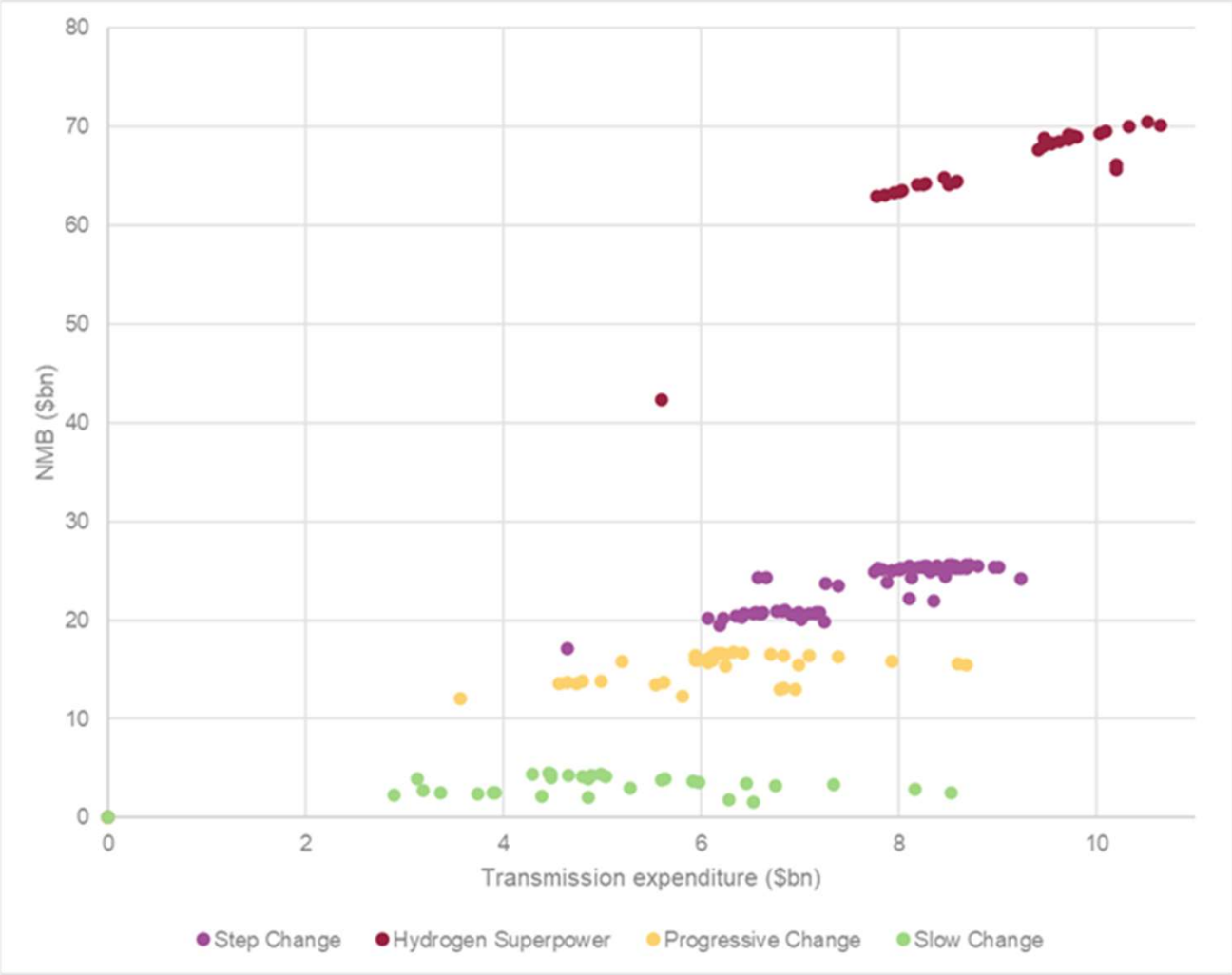
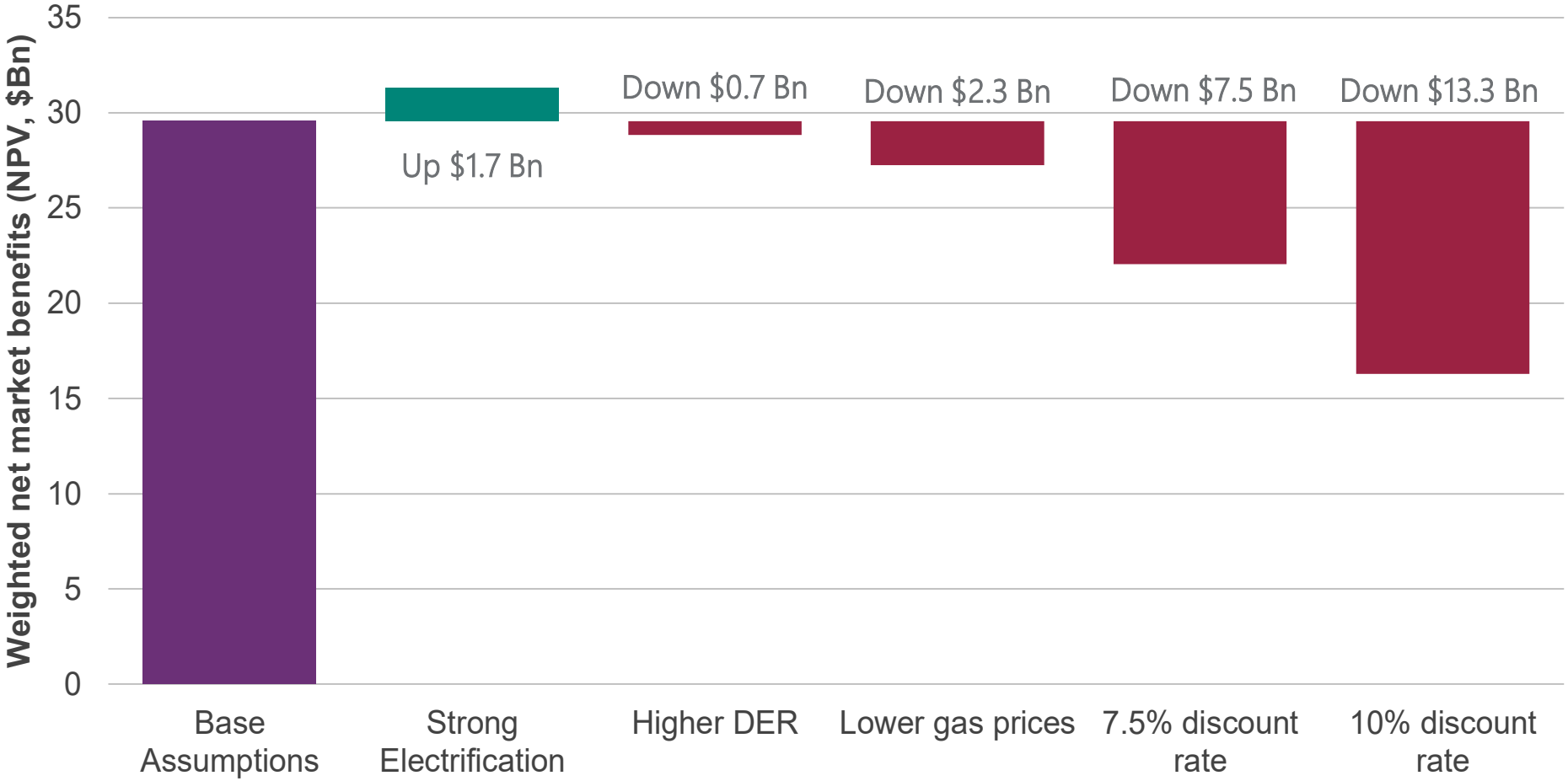
Top CDPs all yield $29 billion net market benefits



Sensitivities explore the robustness of the ODP



Further checks and balances exist for actionable projects

- Actionable projects are required in all scenarios.
  - Not a matter of 'if' but 'when' these projects are optimal.
  - The best development paths largely include different timings of the same projects.
  - Removing any actionable project entirely drops benefits by at least $1 billion.NF1
- Delivering projects late is more costly than delivering them early.
  - Actioning projects now manage risks of early coal closures, policy change and delayed transmission delivery.
  - Investment certainty provides benefits to consumers that is not easily quantifiable.
- Early works and decision rules are used to progress VNI West and HumeLink so that decisions can be made with firmer costs.
- After the RIT-T, the "ISP Feedback loop" will check whether the project remains optimal and aligned with the ISP.

Slide 22

NF1 Andrew - please confirm the lowest TOOT benefit

Nicola Falcon, 14/12/2021

Consultation on the Draft ISP

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Consultation on the Draft ISP

Next steps in the consultation process

- Pre-submission forum 1 Feb 2022.
- Written submissions to the Draft ISP are due by 11 Feb 2022.

Events for consumer advocates

- AEMO Consumer Forum 15 Dec 2021
- Verbal comment session 4 Feb 2022

Reports from the AER and ISP Consumer Panel

- The AER's Draft ISP review report due one month after publication
- ISP Consumer Panel's report on Draft ISP due two months after publication

Questions

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