



Transgrid Advisory Council

Wednesday 3 November 2021





Welcome and introductions

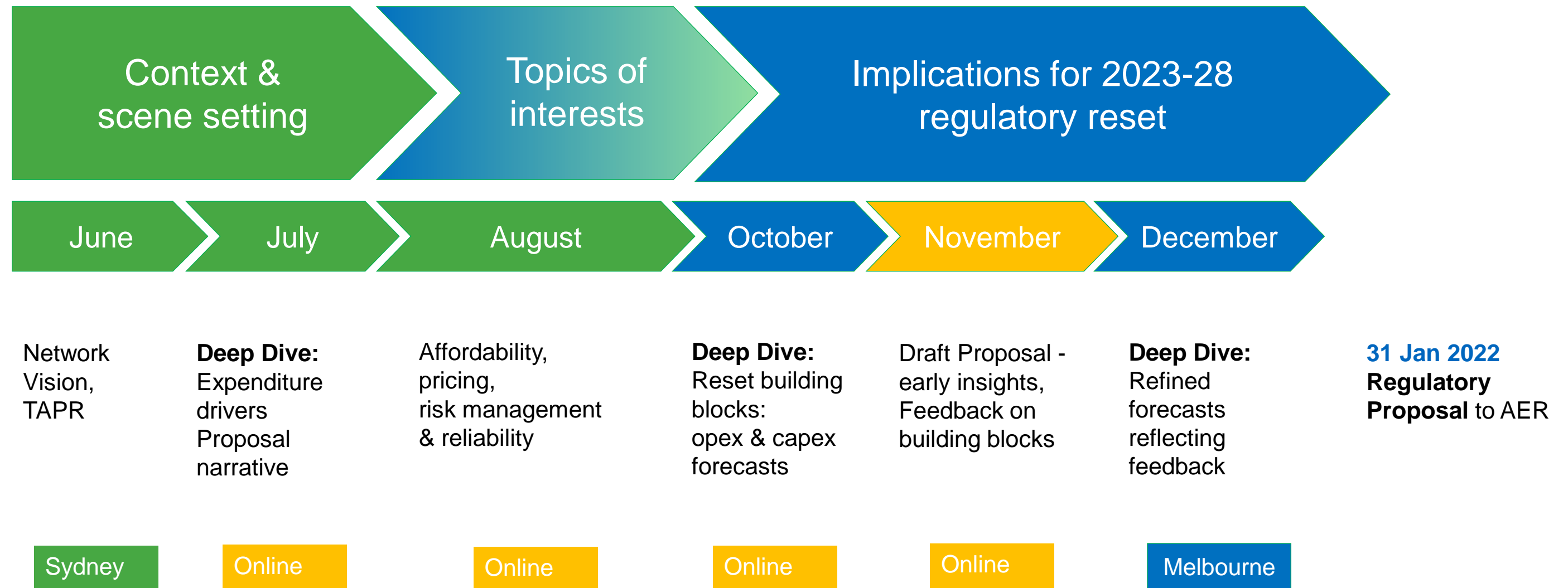
Brian Salter, Acting Chief Executive Officer

Catherine O'Neill, Stakeholder Engagement Lead

3 November 2021



Revenue Reset: 2021 Consultation timeline



Meeting Agenda

	Agenda Item	Presenter	Time
9:30 am	Welcome and introduction	Brian Salter	20 mins
9:50 am	Outcomes for customers	Stephanie McDougall	15 mins
10:05 am	Revenue & Price sensitivity	Stephanie McDougall	15 mins
Matters raised in previous TAC meeting			
10:15 am	1. Overview of ISP regulatory process	Alex Wonhas, AEMO	15 mins
10:30 am	2. ICT	Russell Morris	15 mins
10:45 am	3. Capitalised overheads	Stephanie McDougall	10 mins
10:55 am	4. Asset replacement and RAB	Stephanie McDougall	15 mins
11:05 am	5. Approach to Transmission Pricing	Stephanie McDougall	10 mins
11:15am	Break (<i>5 mins</i>)		5 mins
11:20am	6. Non-network solutions	John Howland	10 mins
Discussion on Preliminary Revenue Proposal			
11:30pm	7. Feedback on proposal: Opex, capex, depreciation	Stephanie McDougall	25 mins

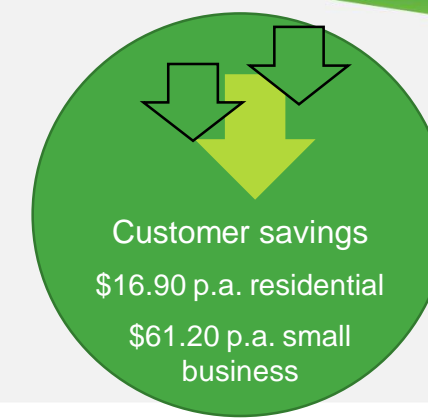


Customer and other stakeholder outcomes in 2023-28

Stephanie McDougall, Head of Regulation



2023-28: customer and other stakeholder outcomes



1. Cost savings



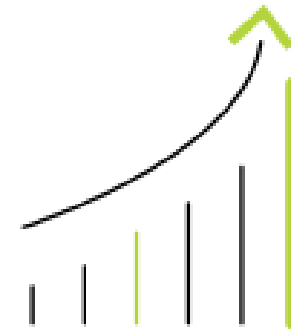
2. Continued safety, reliability & security



3. Support changing generation mix



4. Serve rapid load growth



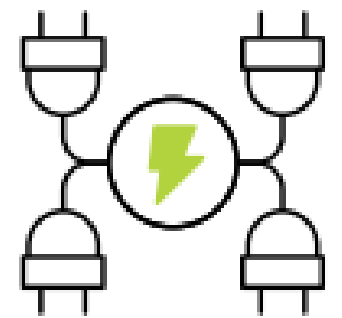
5. Provide cyber & physical security



6. Promote climate resilience



7. Facilitate new technology



Transmission savings

- \$16.90 p.a. residential
- \$61.20 p.a. small business

An ageing asset base

- Maintain Network risk index at 1.0
- Maintain reliability above 99.9%

Compliance requirements

- Voltage stability
- Fault levels

Localised load growth

- Western Sydney
- North West slopes
- Central West
- Broken Hill
- Beryl & Vineyard

Australian Government's new framework

- Operational technology equipment
- ICT

More frequent extreme climate driven events

Replace assets with more resilient alternatives

Network congestion

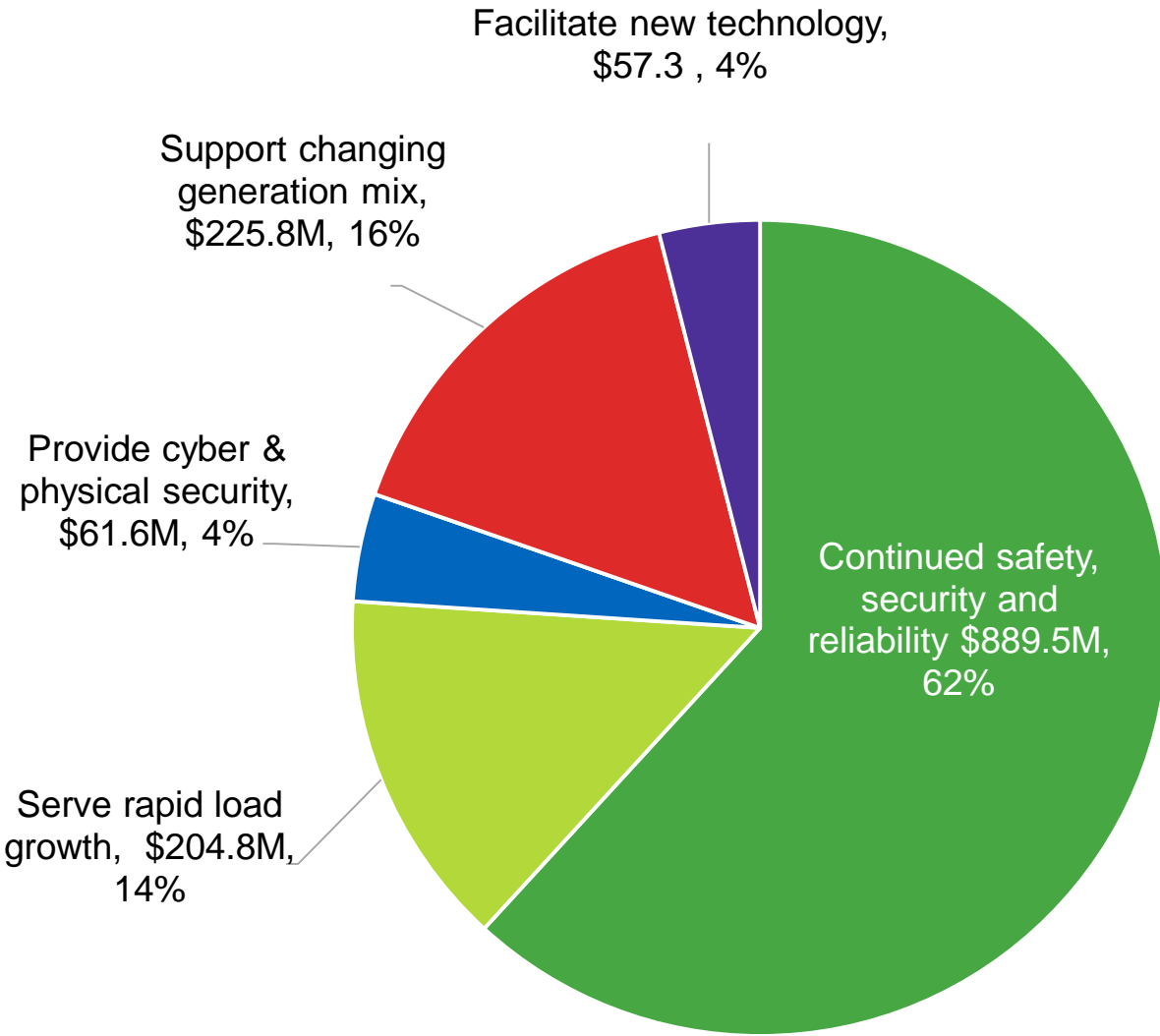
- Relieve congestion to enable low cost low emission generation
- Improve operational response

2023-28: customer and other stakeholder outcomes

Outcomes	Repex	Augex	ICT	Fleet & Property
Continued safety, reliability & security	✓		✓	✓
Support changing generation mix	✓	✓		✓
Serve rapid load growth		✓		
Provide cyber & physical security	✓		✓	
Facilitate new technology		✓		
Promote climate resilience	✓			
Total¹ \$1,439.0M	\$786.5M	\$332.5M	\$86.9M	\$68.7M

Notes 1. Includes \$164.4M capitalised overheads

Total Capex \$1,439M (Real 2022-23)



Cost savings

Affordability is customers' highest priority - we will provide value for money services

- **Rely on uncertainty mechanisms**

This ensure customers only pay for investments if, and when, they proceed

- Contingent projects
- Pass through events, and
- Automatic contingent projects for Actionable ISPs.

- **Reflect current period efficiencies and innovations in forecasts**

- Opex base-year outperformance delivers savings of \$17 million in 2023-28
- 0.3% p.a. productivity growth improvement reduces opex by \$9.4 million in 2023-28

- **Absorb material cost escalators**

- We forecast materials' costs will increase faster than CPI, but have included no real increase in materials costs

- **Respond to efficiencies**

- AER benchmarking shows we have sustained our efficient performance over many years

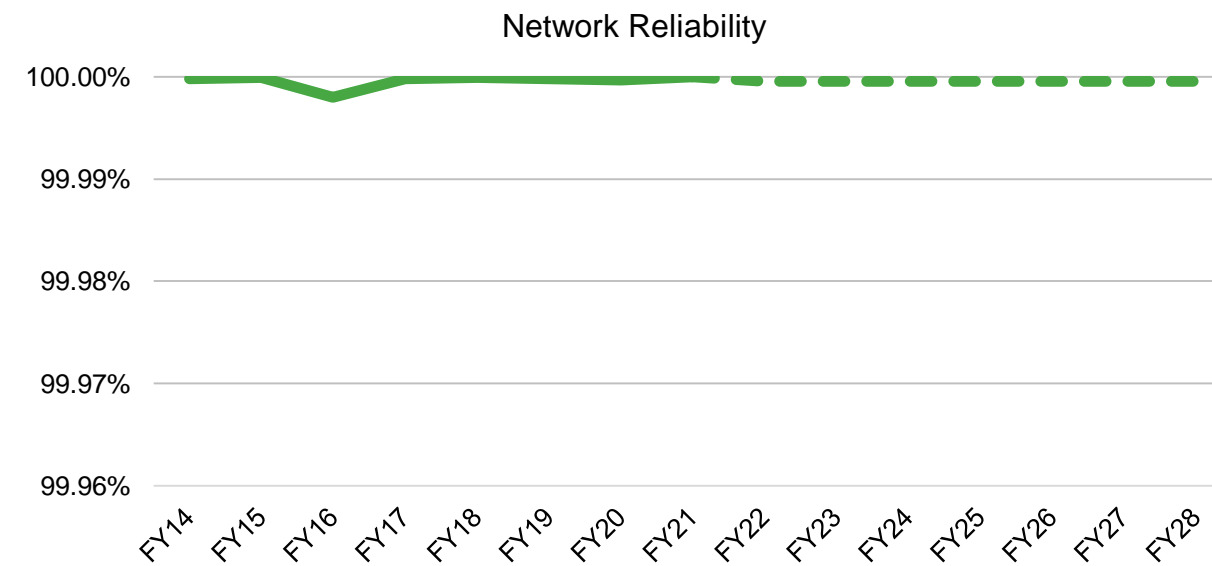
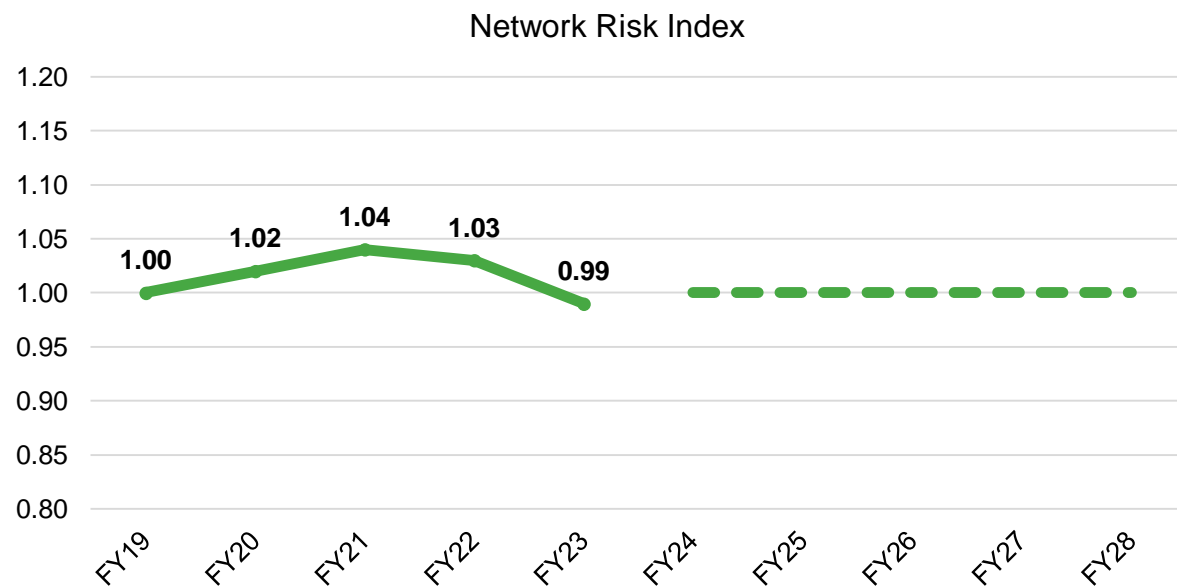


Continued safe, secure & reliable supply

We are investing to ensure continued safe, secure and reliable delivery of energy to 4 million customers cross NSW and the ACT

We will:

- Renew and replace increasing deteriorated and obsolete assets to maintain long-term condition of our ageing asset base
- Refresh and replace end of life ICT assets which support our core business
- Provide safe, compliant and productive offices and depots that support our core business
- Provide fit for purpose fleet, plant and equipment allows us to access and undertake work on our network

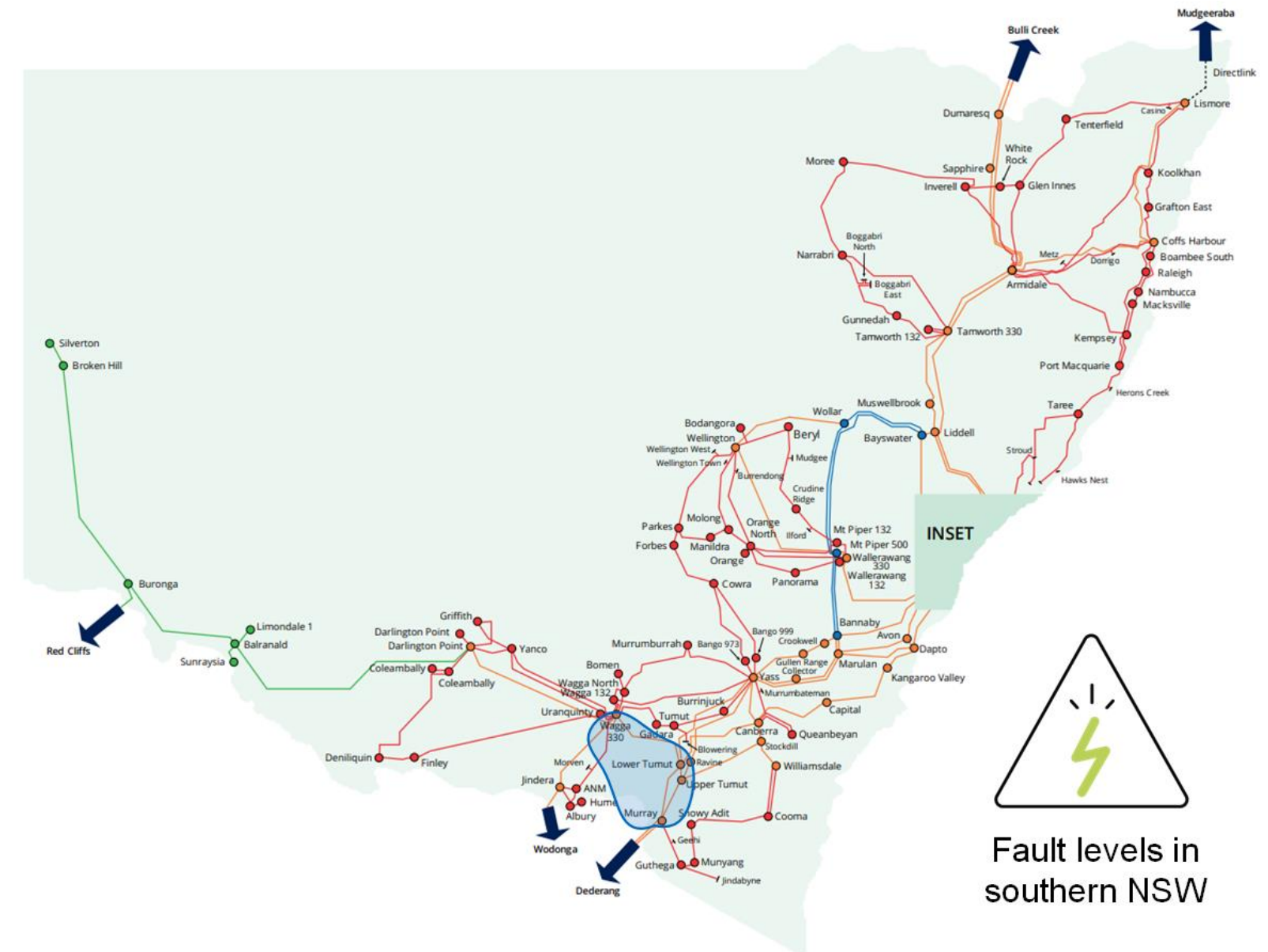


Support the changing generation mix

We are investing to support the changing generation mix while continuing to meet NER compliance obligations

We will:

- Respond to increasing **fault levels** as new generators connect and we invest in ISP projects in southern NSW.
 - Upgrade fault levels in Southern NSW (replace equipment with higher fault capacity)
- Maintain **voltage levels**, which are impacted by the declining minimum demand due increased PV uptake.
 - Invest in voltage control devices in:
 - southern NSW (Kangaroo Valley, Darlington Point and Buronga),
 - north-west NSW (Moree and Inverell) and
 - greater Sydney (Beaconsfield)

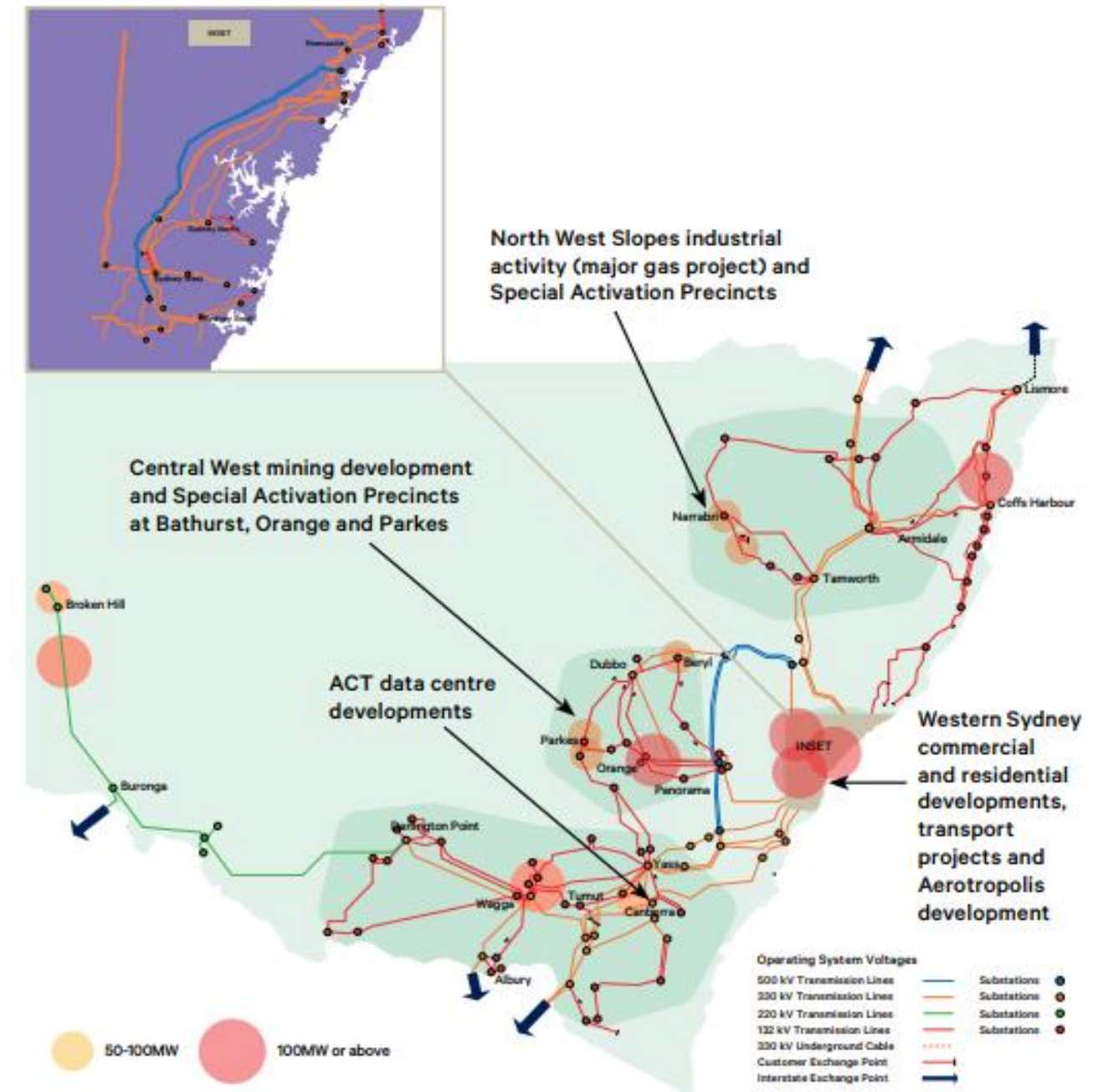


Serve rapid load growth

We are investing to serve rapid load growth where it is occurring

Strong maximum demand in some pockets is driven by data centres, mine expansions and new commercial and residential developments. We will invest to address load growth in:

- Western Sydney Priority Growth area
- North West Slopes
- Central West
- Broken Hill, and
- Beryl and Vineyard



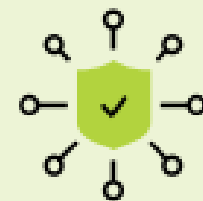
Provide cyber and physical security

We are investing to ensure the security of our cyber and physical assets

We will align with the Australian Governments new cyber and physical security obligations through:

- Network related digital infrastructure (**operational technology equipment**)
- Cyber security ICT investments

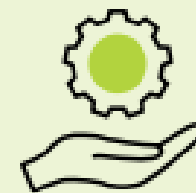
New cyber and physical security obligations:



Security of Critical Infrastructure Act 2018



Security Legislation Amendment (Critical Infrastructure) Bill 2020, introduced to Federal Parliament on 10 December 2020



the Federal Government is considering a proposal to introduce an enhanced regulatory framework that will increase our security and resilience requirements

Promote climate resilience and facilitate new technology

Promote network resilience to climate change

As the frequency, intensity and duration of climate-driven extreme weather events increases, we will replace assets with more resilient alternatives based on condition.

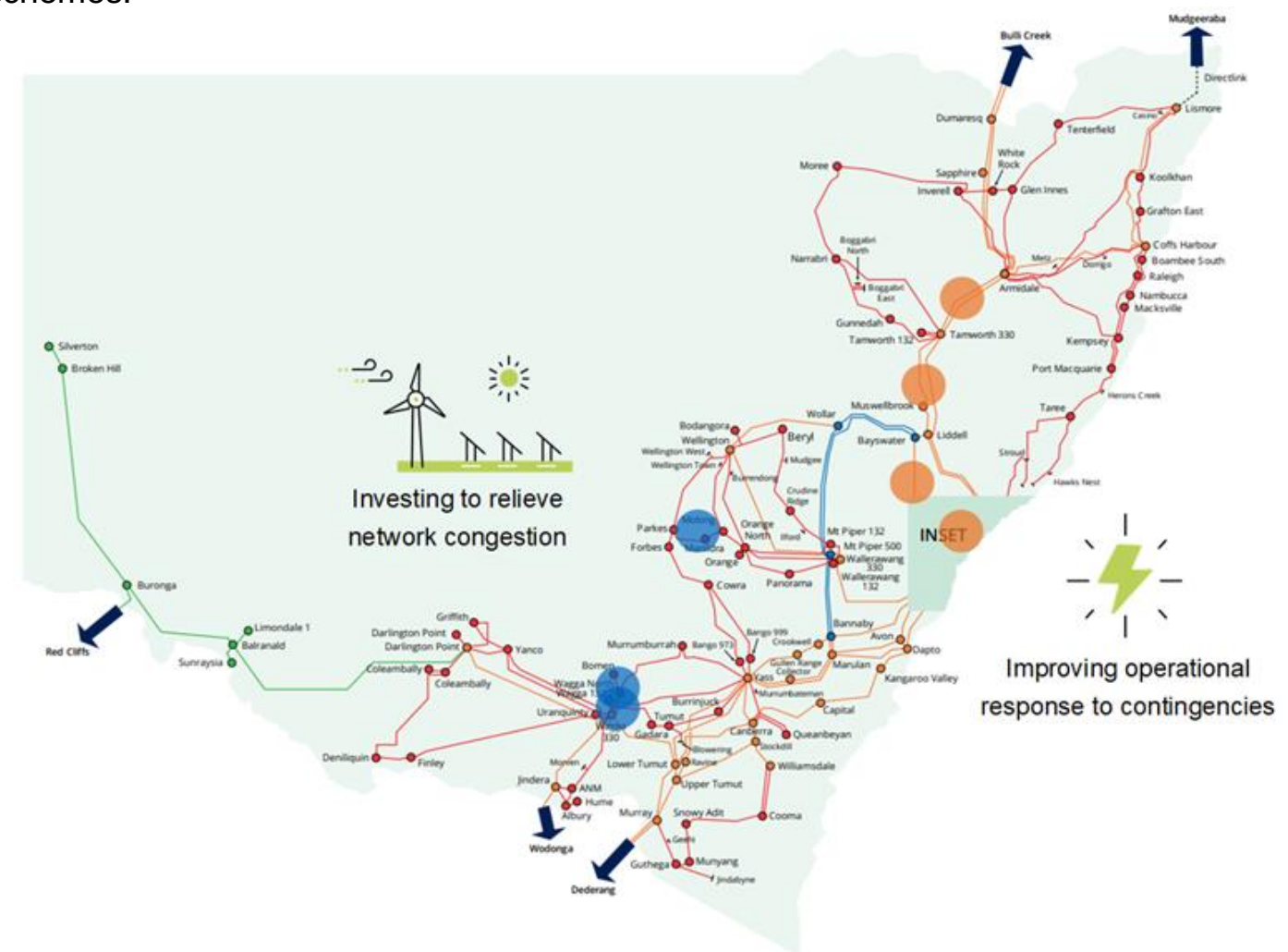


Facilitate new technology

Relieve network congestion and enable additional generation from low cost, low emission sources:

- Increase network capacity in Wagga and Wagga North

Improve operational response to contingency events through special control and protection schemes.





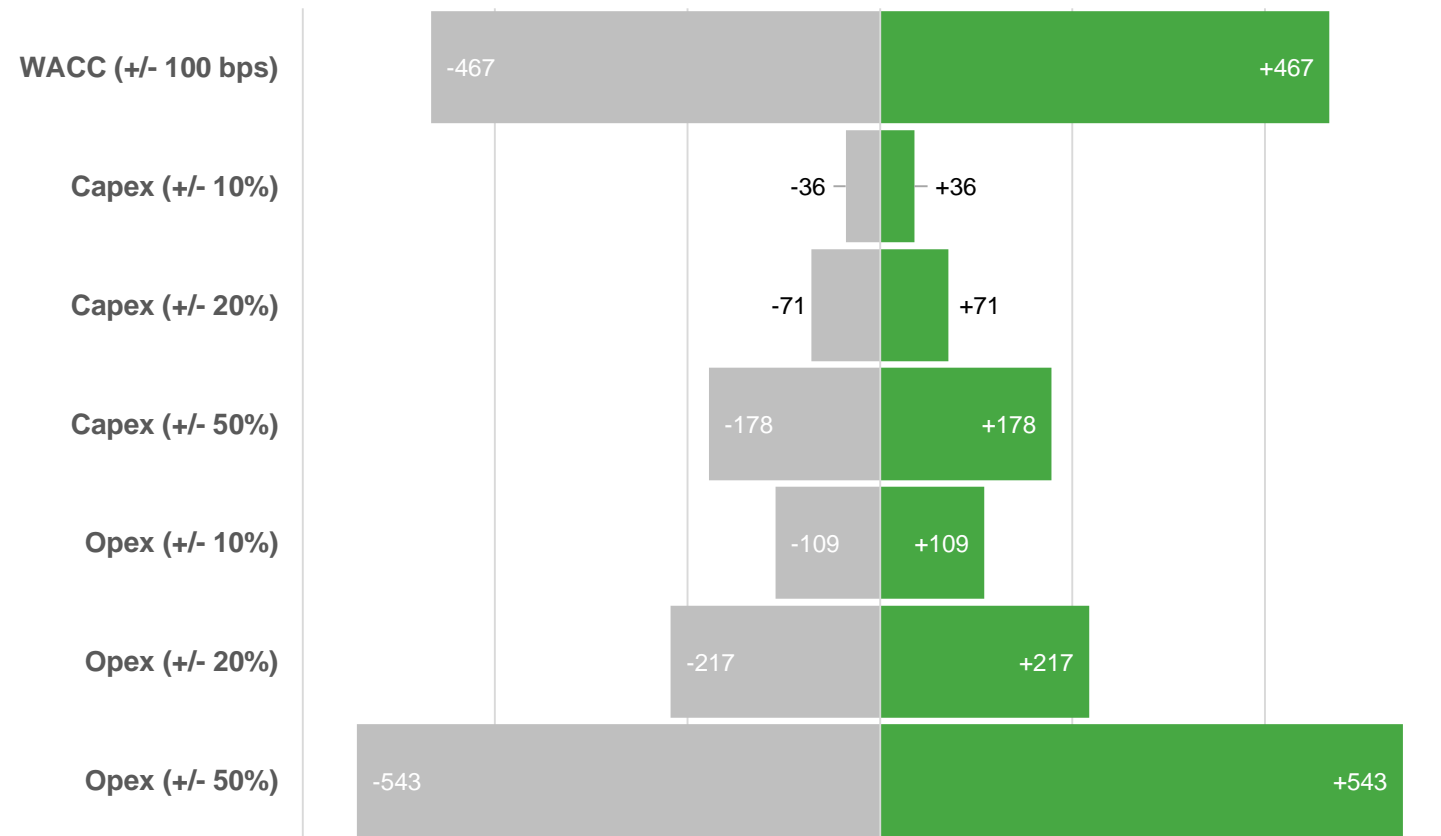
Revenue & price sensitivity

Stephanie McDougall, Head of Regulation



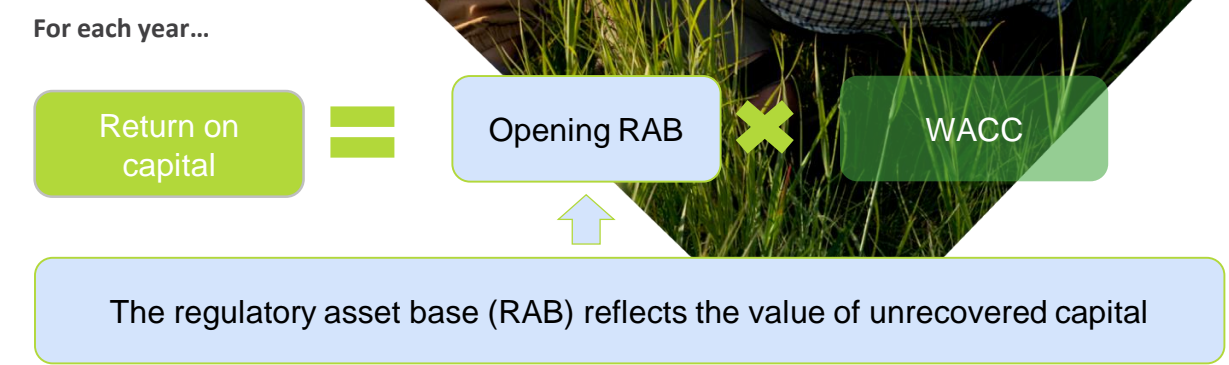
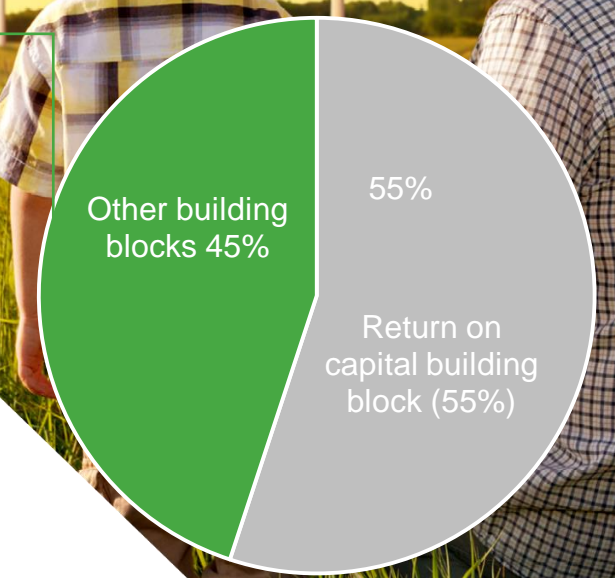
Transgrid
2023-28 Preliminary Proposal - revenue sensitivity

Smoothed revenue impact (\$M, Real 2022-23)



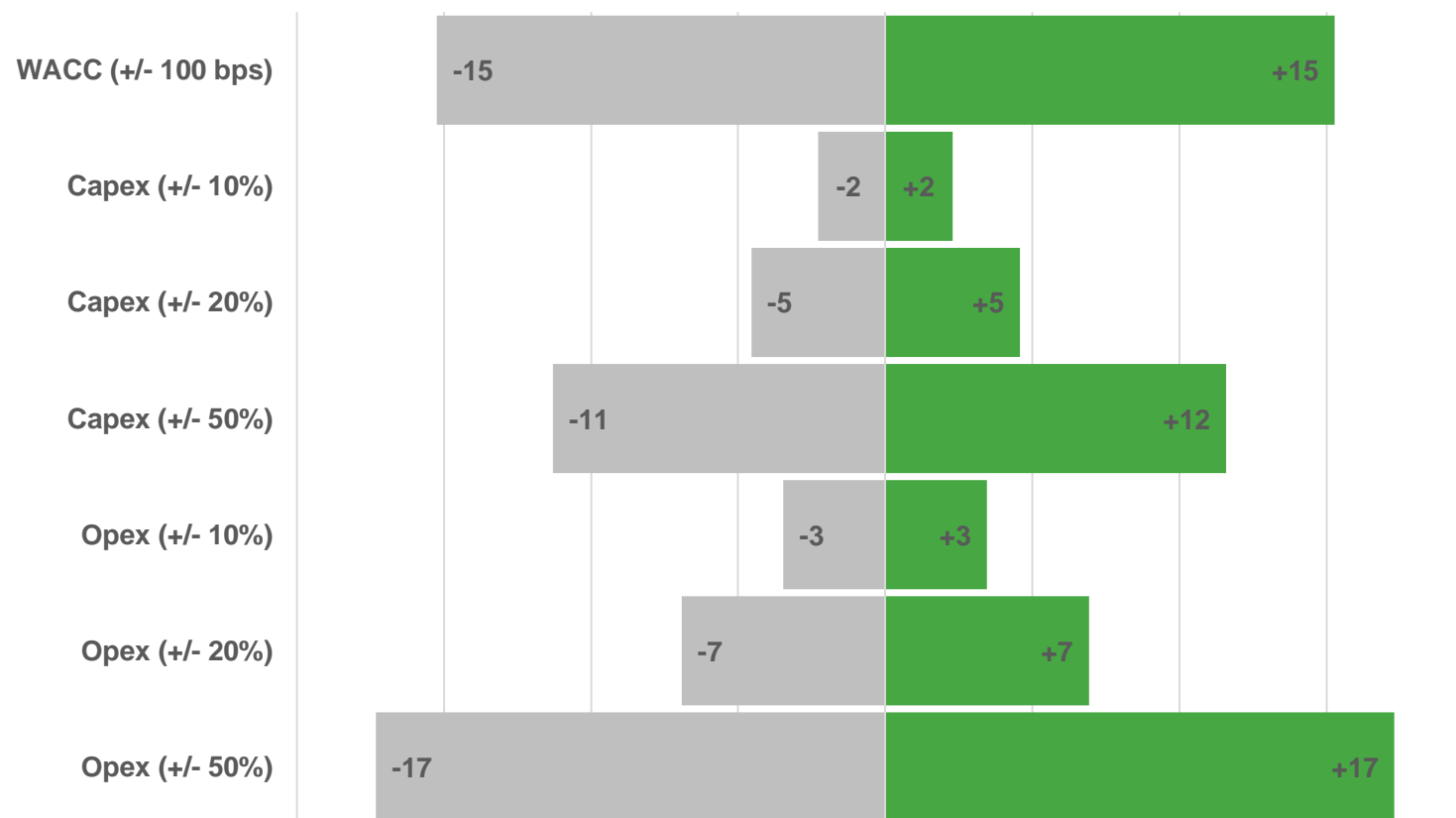
- Return of capital – depreciation
- Opex
- Revenue adjustments – incentive increments & decrements
- Tax

AER 2018-23
building block revenue allowance



Transgrid
2023-28 Preliminary Proposal - price sensitivity

Residential bill impact (\$ per year, Real 202-23)



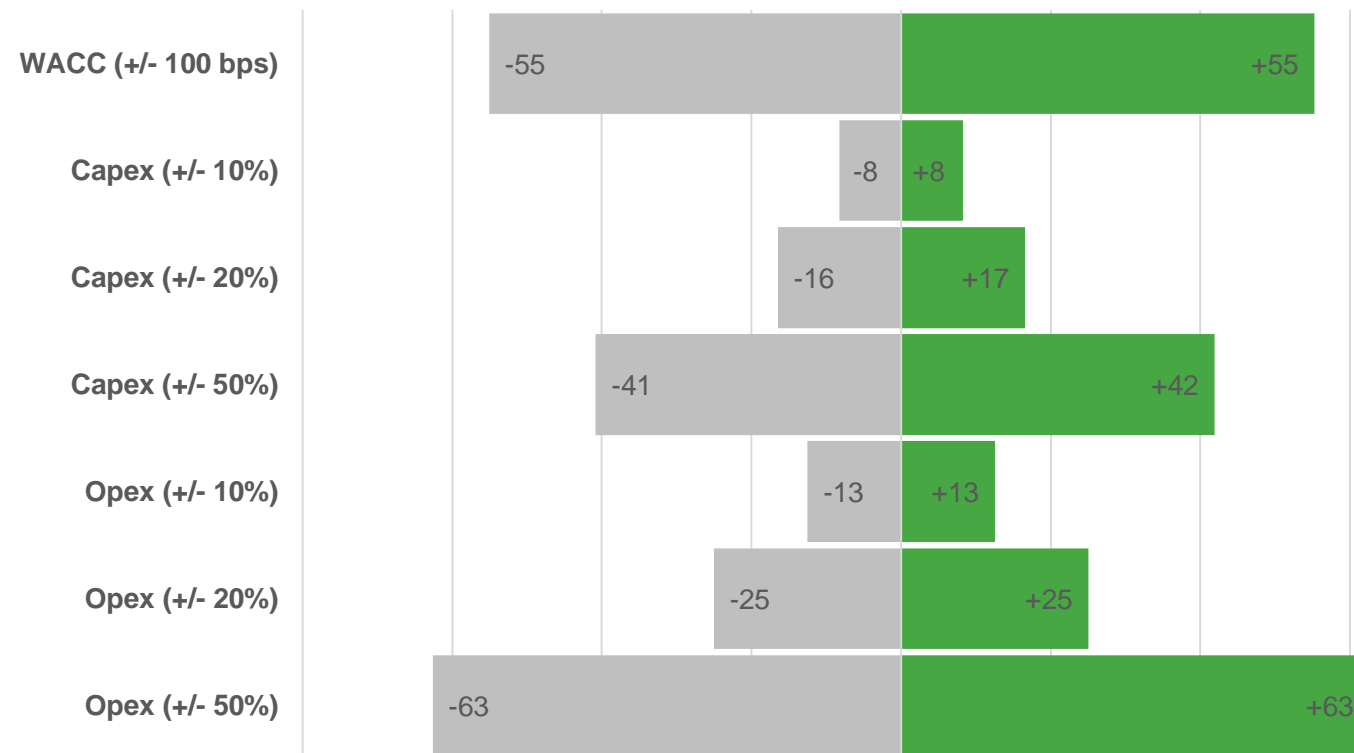
Transmission costs comprise 7 % of the total indicative residential household bill in NSW and ACT

Electricity supply chain	Proportion of total residential household bill %
Generation	28
Transmission	7
Distribution	22
Retail and other	15
Environmental policies	28

Source: AcilAllen, TransGrid TUOS as a proportion of residential and small business electricity bills, 14 September 2021

Transgrid
2023-28 Preliminary Proposal - price sensitivity

Small business bill impact (\$ per year, Real 202-23)



Transmission costs comprise 8% of the total relative small business bill in NSW and ACT

Electricity supply chain	Proportion of total small business bill %
Generation	24
Transmission	8
Distribution	28
Retail and other	12
Environmental policies	29

Source: AcilAllen, TransGrid TUOS as a proportion of residential and small business electricity bills, 14 September 2021

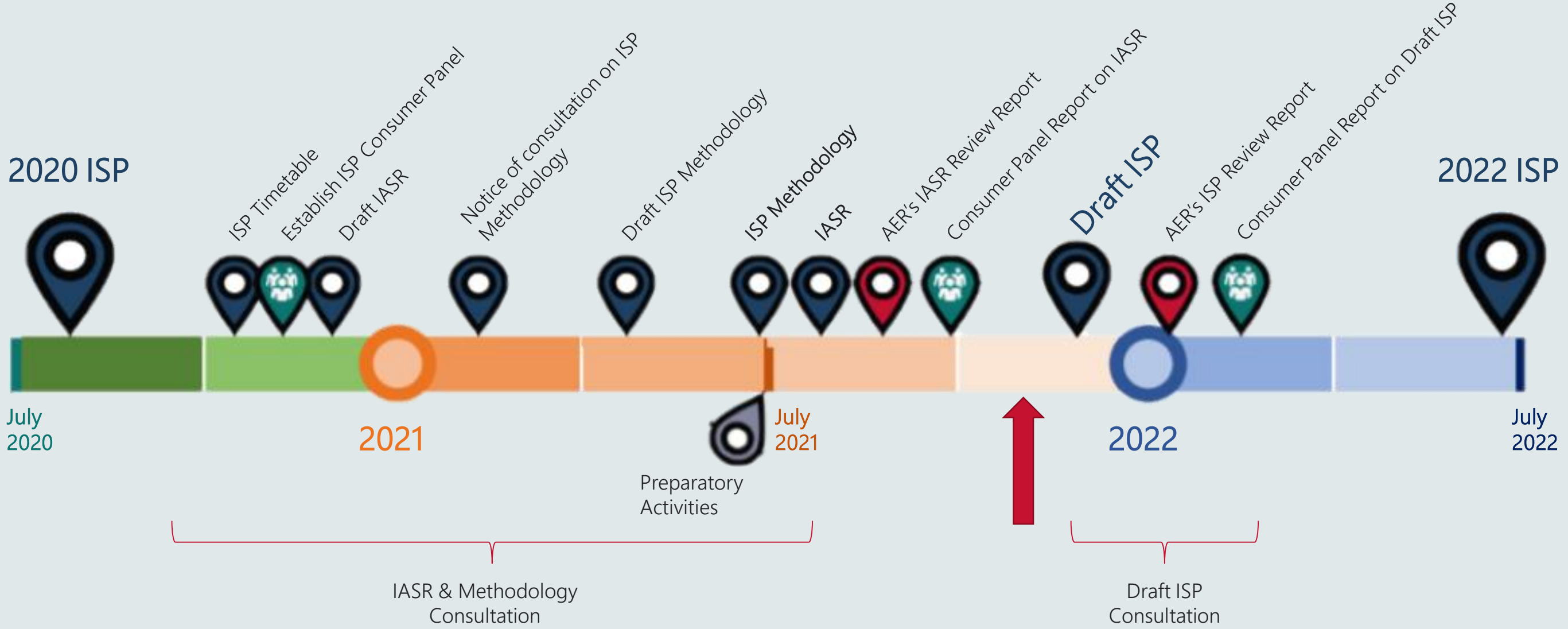
Pathway to the 2022 Integrated System Plan (ISP)

Alex Wonhas, EGM System Design

Transgrid Advisory Council

3 November 2021

2022 ISP Timeline



The ISP is built on strong feedback from the electricity sector – IASR submissions

Advisory



Consumer Advocacy

ISP Consumer Panel



Environment



Electricity & Gas Network



Generation/Retail



Developer



Government




Senator Gerard Rennick

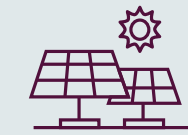
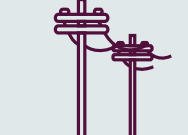
Other



Oscar Archer

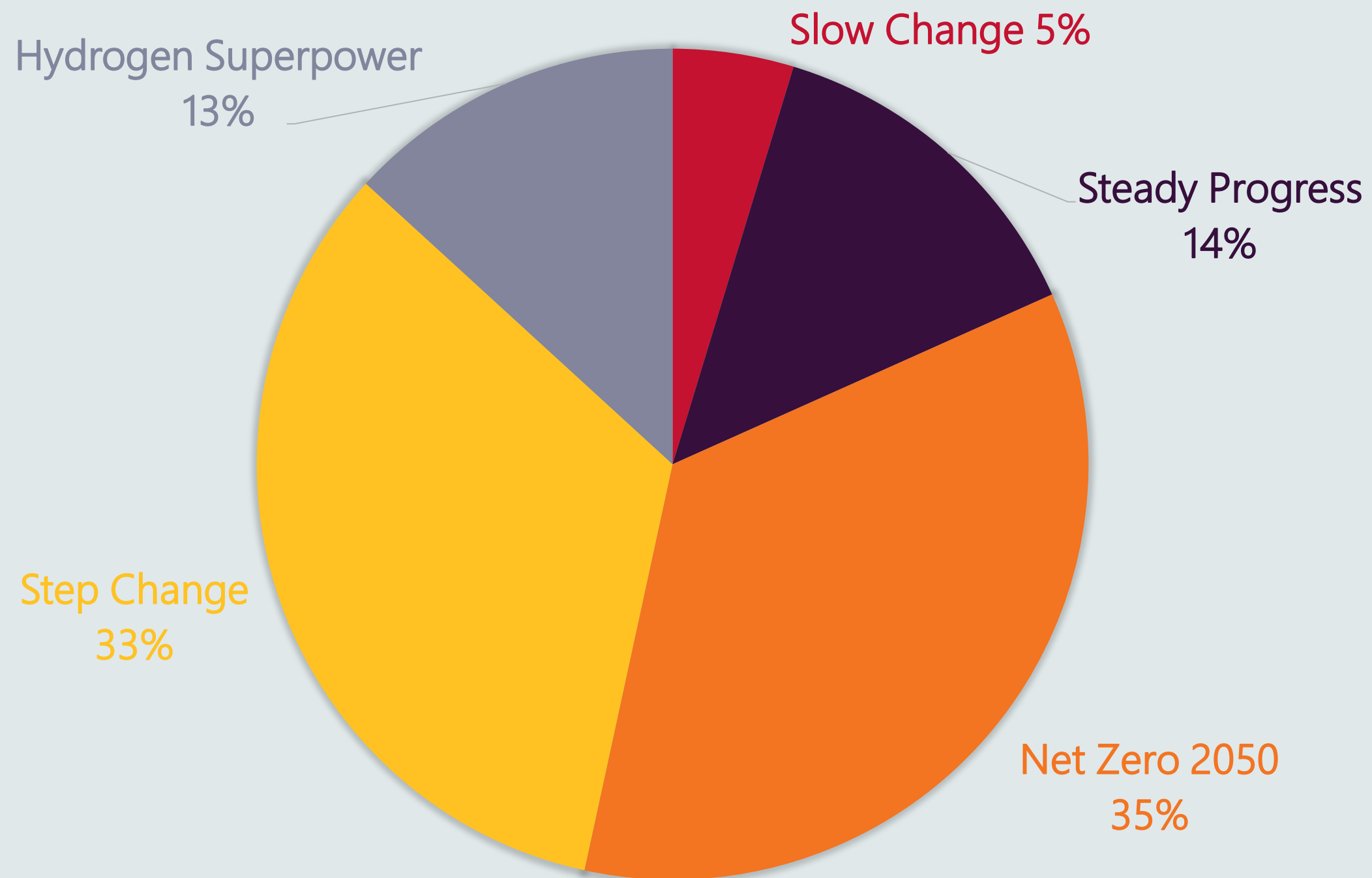
The NEM in 2040: a snapshot

	<i>Market led (slow recovery)</i>	<i>Market led</i>	<i>Technology led</i>	<i>Consumer led</i>	<i>Expanded economy</i>
	Slow Change	Steady Progress	Net Zero 2050	Step Change	Hydrogen Superpower
 Demand					
Electrification					
• % of road transport that is EV by 2040	○ 22%	○ 44%	● 52%	● 58%	●● 76%
• % of residential EVs still relying on convenience charging by 2040	○ 68%	○ 61%	○ 57%	● 47%	● 40%
• Industrial electrification by 2040	○ -25 TWh	○ 8 TWh	● 32 TWh	● 45 TWh	●● 66 TWh
• Residential electrification by 2040	○ 0 TWh	○ 0 TWh	● 6 TWh	● 9 TWh	● 10 TWh
Energy efficiency savings by 2040	○ 16 TWh	● 25 TWh	● 30 TWh	● 44 TWh	● 44 TWh
Underlying Consumption					
• NEM underlying consumption by 2040	○ 184 TWh	● 245 TWh	● 276 TWh	● 279 TWh	●● 329 TWh
• H2 consumption (domestic), 2040	○ 0 TWh	○ 0 TWh	○ 2 TWh	● 15 TWh	●● 64 TWh
• H2 consumption (export), including green steel, 2040	○ 0 TWh	○ 0 TWh	○ 0 TWh	○ 0 TWh	●●● 221 TWh
• Total underlying consumption by 2040	○ 184 TWh	● 245 TWh	● 278 TWh	●● 294 TWh	●●●● 614 TWh
Supply					
Distributed PV Generation	○ 47 TWh	○ 51 TWh	● 61 TWh	● 66 TWh	● 83 TWh
% of household daily consumption potential stored in batteries	○ 4%	● 12%	● 17%	● 32%	● 35%
% of underlying consumption met by DER by 2040	● 26%	● 21%	● 22%	● 22%	○ 13%
Estimate of % coal in generation mix by 2040	● 50%	○ 20-25%	○ 15-20%	○ 5%	○ 0%
Estimate of NEM emissions production by 2040 (MT CO2-e)	TBD	TBD	55 ○ (~40% of 2020 NEM emissions)	10 ● (~7% of 2020 NEM emissions)	1 ● (~1% of 2020 NEM emissions)

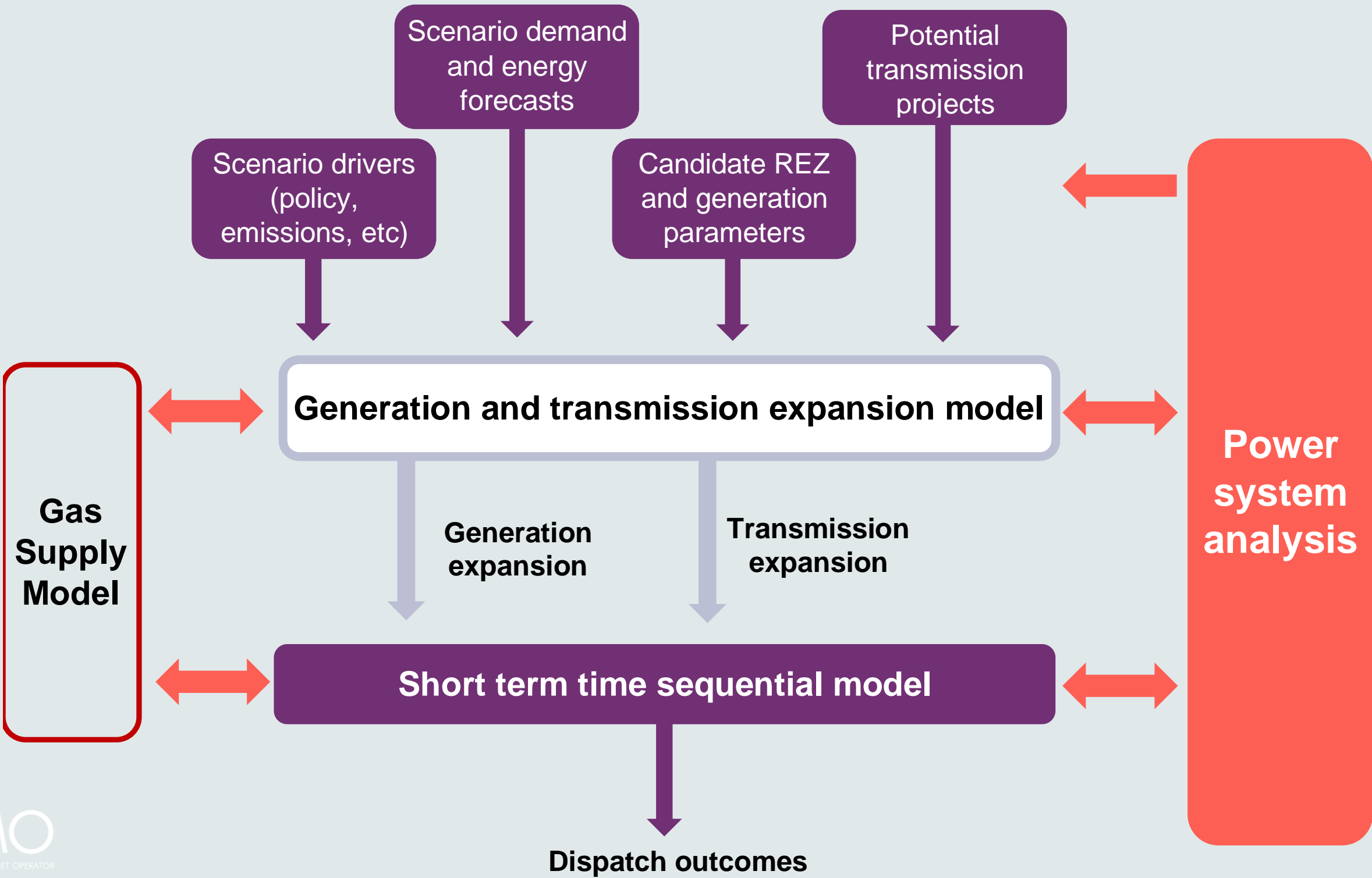


Overall Delphi Panel results – scenario likelihoods

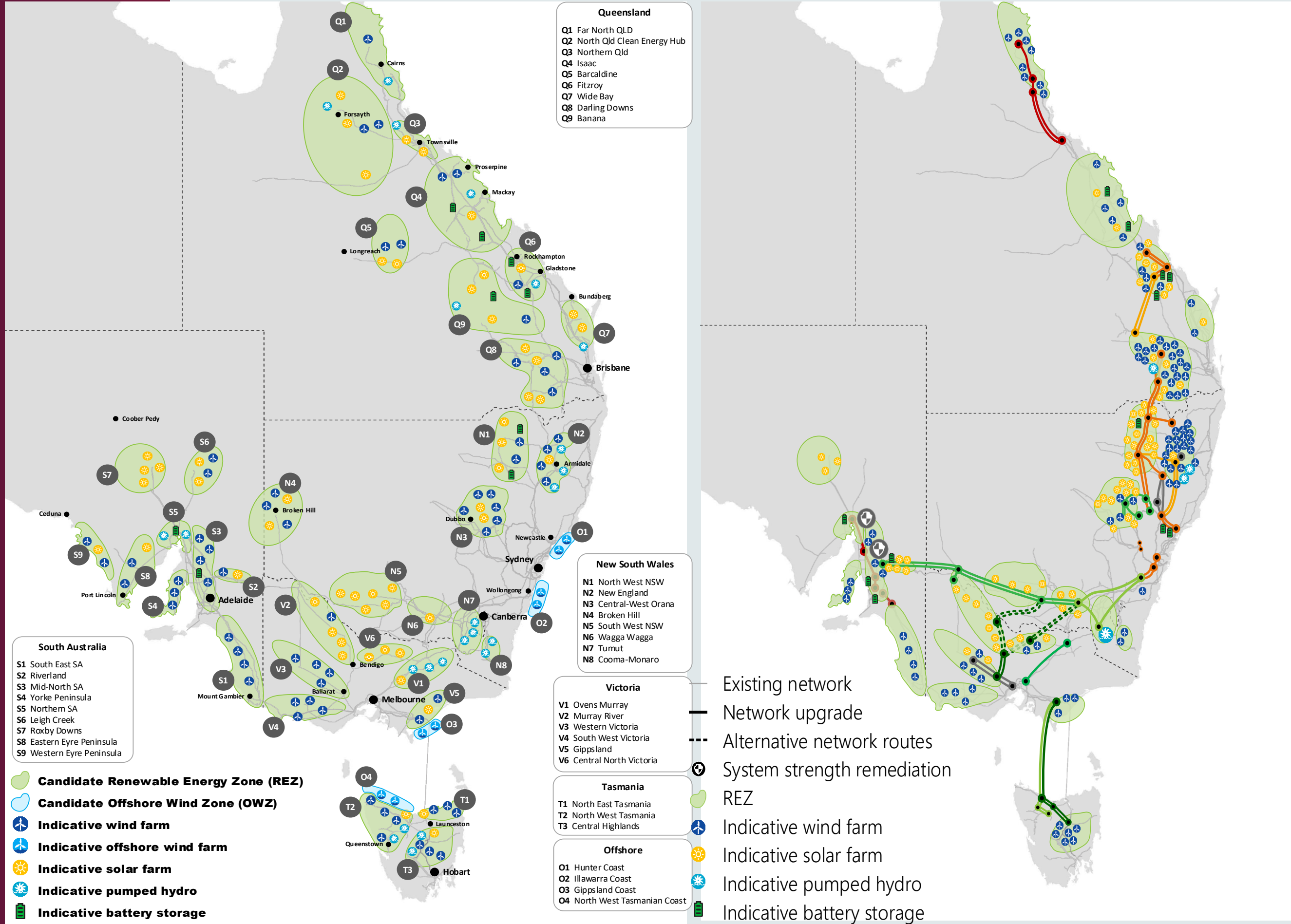
TO BE UPDATED



Modelling approach



ISP outcomes: REZ and transmission



THANK YOU

ISP homepage: <https://aemo.com.au/en/energy-systems/major-publications/integrated-system-plan-isp>

Sign up for updates: <https://aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2022-integrated-system-plan-isp/get-involved>

Contact: ISP@aemo.com.au.



ICT overview

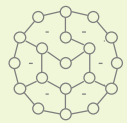
Russell Morris, Chief Information Officer



ICT RP3 Overview

BENCHMARKED

INDUSTRY
AGNOSTIC



TECHNOLOGY



GLOBAL

ENERGY SECTOR
SPECIFIC



AUSTRALIA



NSW

The key drivers for our ICT Strategy 2023-28

- Becoming resilient through the elimination of legacy risk
- Securing information assets via compliance obligations
- Building adaptability for the energy transition
- Unlocking scalability and opportunities through new technology
- Nurturing digital skillsets increasing access to insights
- Facilitating toolsets for workforce mobility, productivity and engagement
- Building meaningful connections, transparency and engagement with our customers in the energy ecosystem

Addressing risk to sustain the technology services that power our business.

IFRS
Capex/Opex
trade-off
\$23.5m
over 5 years


Capital
\$87m
over 5 years

Cyber
Compliance
step-change
\$17m
over 5 years

Base
Year
adjustments
\$0


ICT RP3 Packages

Addressing legacy system risk, building resilience, enabling growth, modernising performance




Infrastructure and Network
\$17.8m

Ensuring supportability, building adaptability, symmetry with industry participants, removing constraints




Application Maintenance
\$18.2m

Building adaptability, ensuring connectedness to energy ecosystem, removing constraints, enabling elasticity



Operational Evolution
\$1.9m

Enabling insight, expediting decision making, championing truth and accuracy, promote digital culture



Data and Decisioning
\$6.3m

Employee Enablement
\$12.2m



Modernising working practices, creating employee flexibility, modern toolsets for modern mindsets

Bespoke Applications
\$17.5m



Ensuring supportability, building adaptability, focusing on differentiation, removing risks

Cyber Security
\$12m



Securing assets, protecting data, ensuring compliance, protecting customer interests

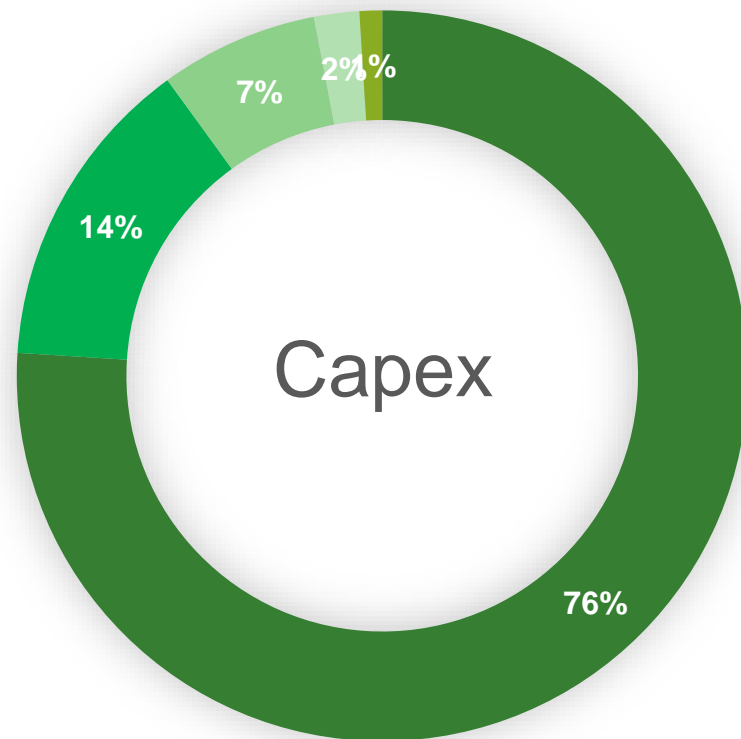
Customer Safety and Support
\$1m



Caring for our customers, ensuring employee safety, effective partnering with energy ecosystem

Modern tools, modern ways of working, modern practices.

ICT RP3 – By Numbers

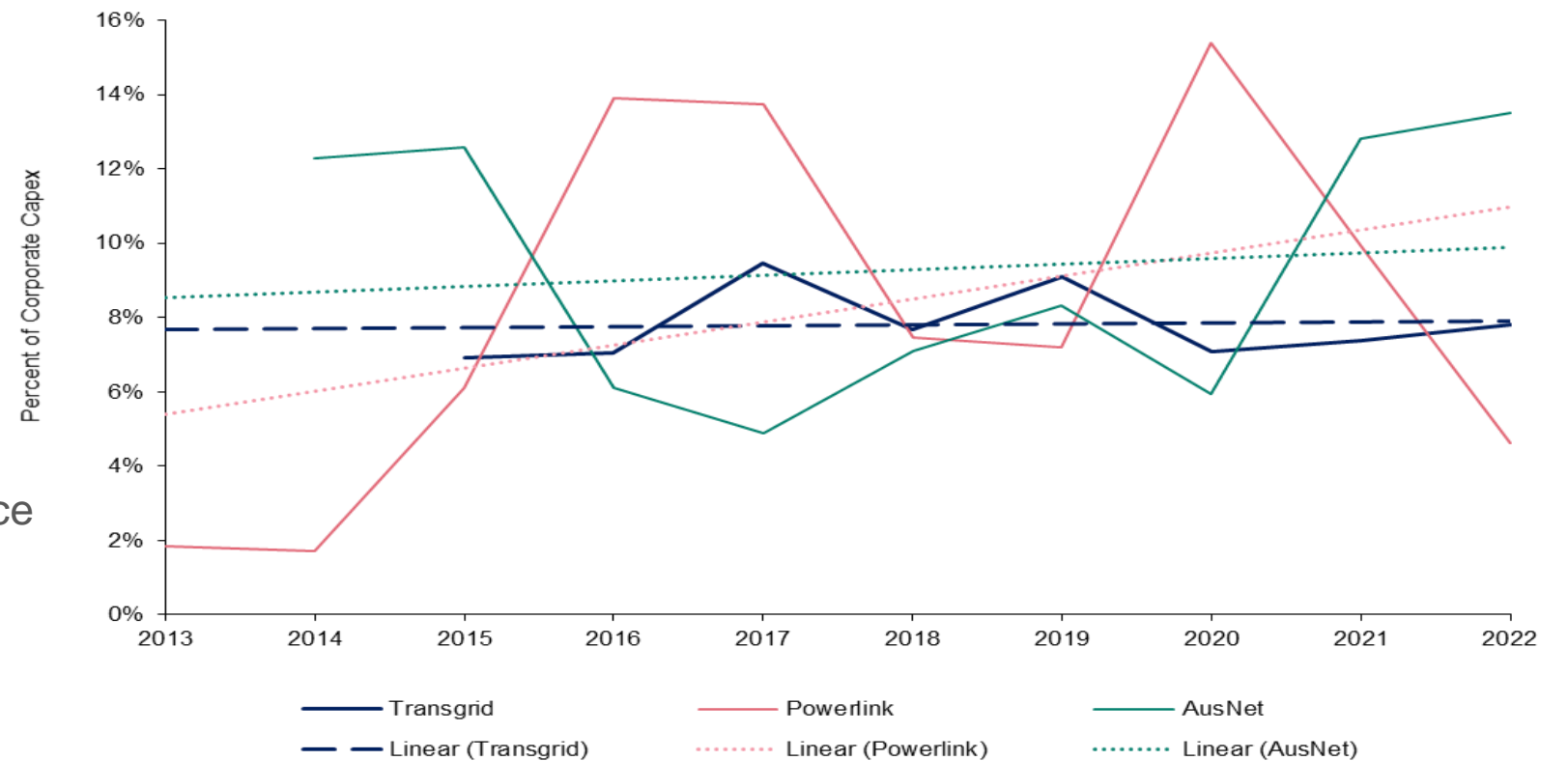


■ Risk & Resilience ■ Security ■ Data & Insights ■ Scalable Capability ■ Customers

- \$65.7 million (76%) to address aged system risks
- \$12.0 million (14%) combating cyber security risks and ensuring compliance
- \$6.3 million (7%) for data, insights and improved decision making
- \$1.9 million (2%) to evolve core operational capabilities
- \$1.0 million (1%) dedicated to improved customer visibility

Our 2023-28 ICT forecast is \$7 million lower than our estimated 2018-23 capex of \$94 million.

Our RP1/RP2 spend is more both consistent and lower cost when benchmarked against our peers. A sustained pipeline ensures optimised resourcing increasing per employee value output.



Matters raised in previous TAC meetings

Capitalised overheads and asset replacement and RAB

Capitalised overheads

- Capitalised overheads - corporate support and management costs not directly incurred in producing output, and shared costs that we cannot directly allocate to a business activity or cost centre
- The key driver in our overhead costs is growth in our overall capital program
- We have forecast our overhead costs using the AER's default approach based on:
 - 75 per cent of capitalised overheads are fixed, and
 - 25 per cent of capitalised overheads vary with direct capex.

Asset replacement and RAB

- The RAB is the value of assets used to deliver transmission services.
- It represents the unrecovered real cost of capital investments that we have made, or forecast to make, to provide these services.
- We replace assets on condition - some assets will be replaced before and others will be replaced after they are fully depreciated.
- Assets remain in the RAB until they are fully depreciated or sold so that we can recover our efficient costs.
- Replacing an asset before it is fully depreciated reflects that its useful life is shorter than its economic life.

Approach to transmission pricing

Who pays how much for transmission services?

- Our pricing methodology is used to determine prices to recover our fixed revenue.
- Our pricing methodology must be approved by the AER. There are three key steps to determining prices:

- **Step 1 - Allocate Revenue to service category**

- Entry services
- Exit services
- Common transmission services
- TUOS services

- **Step 2 – Determine revenue to be recovered from each connection point**

There is a mix of approaches including:

- Postage stamp basis
- Value of assets employed at the connection point
- Utilization adjusted asset replacement cost

- **Step 3 – Set transmission pricing structure**

The NER (pricing principles) and the AER's pricing methodology guideline determine the pricing structure that applies to each service category. This includes:

- Fixed prices i.e. \$/day and
- \$/KW - variable based on demand

Reviews of transmission pricing include:

The AEMC is responsible for reviewing and amending the NER. Reviews include:

- 2005-2006 – AEMC first major review of transmission pricing
- 2009 - AEMC review to identify options to improve transparency and accessibility of pricing
- 2016-2020 - Coordination of generation and transmission investment implementation – access and charging (COGATTI)
- Marinus Link cost sharing between NEM regions that benefit from the ISP projects

Transmission reviews underway are considering the issue of who pays how much

We support the ongoing review of the Rules to ensure they remain fit for purpose in a rapidly changing energy market

Break – 5 minutes





Non-network solutions

John Howland, Network Planning



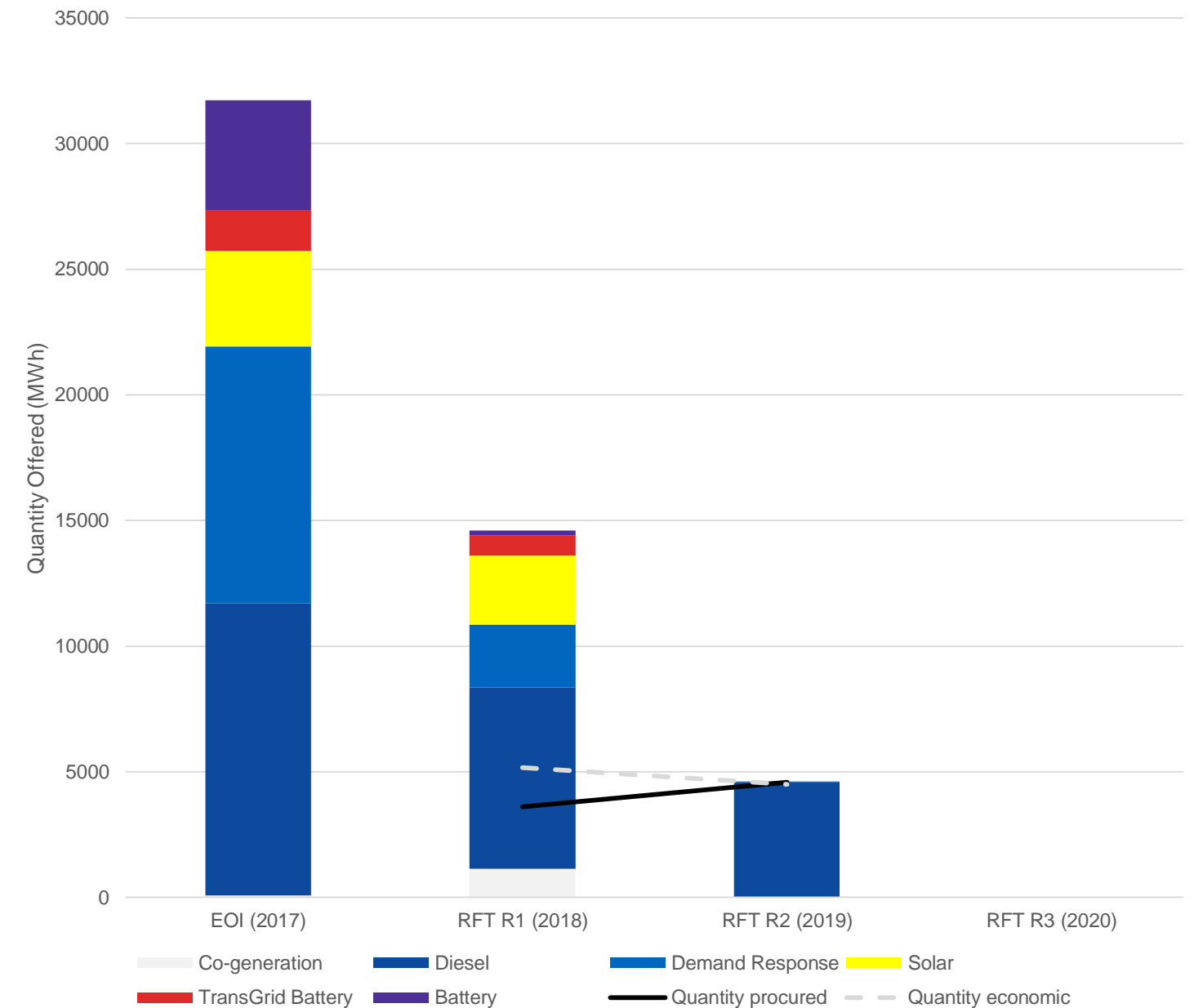
Non-network solutions – current and planned

Powering Sydney's Future

- Transgrid has procured 50 MW of demand management which will be available for summer 2021/22
- The annual RFT rounds are designed to flexibly accommodate changes to:
 - Demand forecasts
 - Cable conditions
 - New DM resources and market conditions
- No additional capacity was offered to RFT R3 (2020)
- Last RFT R4 (2021) has been issued (closed 31 Aug)
- Unlikely to require more capacity:
 - Effect of COVID-19 on Inner Sydney demand

Planned

- No specific innovation expenditure allowance proposed for the 2023-28 period
- Potential non-network solutions will be explored through the RIT-T process



Reliability of supply to Broken Hill

Background

- Back up supply to Broken Hill is currently provided by diesel turbines owned by Essential Energy
- Original RIT-T PADR identified minigrid using compressed air storage as preferred option
- Impact of the change to the RIT-T application guidelines changes ranking of options
 - Changes RIT-T preferred option to existing diesel turbines

Current position

- Revised PADR issued 6/10/21
 - Submissions due 17/11/21

Risk management for non-network solutions

Network Support Agreements

- Transgrid's preferred approach is to contract for the output from network support providers, rather than risk regulated capex.
- This would take the form of a network support contract and is treated as opex like other demand management costs.
- Approved opex costs are passed through and TransGrid does not earn a return on this expenditure.

Type of Fee	Typical network support contract for demand management
Establishment Fee	One-off setup fee to enrol in program Covers admin, metering, contract costs
Availability Fee (capacity payment)	\$/month payment to be made available in required months (e.g. summer) Tied to successful testing and successful dispatch Covers technology investments that operate only a few hours a year
Dispatch Fee (usage payment)	\$/MWh payment for when the solution runs. Covers fuel and operating costs



Feedback on preliminary proposal

Stephanie McDougall, Head of Regulation



Questions to prompt discussion

Opex:

Base year:

Are you satisfied that the base year represents an efficient starting point?

Step changes:

Do you have any concerns about the step changes that we have put forward for insurance, cyber, and ISP prep?

Trend:

Are you satisfied with the way we have calculated the trend that will be applied to opex costs?

Overall:

Are there any aspects of operating costs that you would like to discuss in detail?

Capex:

Total:

Are you comfortable with the level of capital expenditure in 2023-28 which is +7% than previous period?

Repex:

Do you have any concerns about repex spending in the proposal?

Augex:

Do you consider our augex forecast to be reasonable?
Are you satisfied with the information provided to justify expenditure?

Overall:

Are there any aspects of capex that you would to discuss in detail?

Questions to prompt discussion

Depreciation:

Do you have any concerns about depreciation and how it has been calculated for the proposal?

Price outcomes for customers:

Are you satisfied that the revenue and price forecasts represent value for customers?

Do you have any concerns about price that Transgrid can address within this proposal?



Next steps



Next TAC meeting

	TAC meetings
17 June	TAC: Setting the scene
22 July	TAC: Expenditure drivers
<i>30 July</i>	Customer research feedback
19 August	TAC: Topics of interest
<i>14 Sept</i>	Deep Dive – HumeLink
<i>29 Sept</i>	Deep Dive – Energy Vision
5 Oct	TAC: Reset building blocks
<i>7 Oct</i>	Customer research feedback
3 Nov	TAC: Reset proposal overview
1 Dec	TAC: Draft proposal



Transgrid Advisory Council

3 November 2021

