TRANSMISSION PLANNING AND INVESTMENT REVIEW & MATERIAL CHANGE IN NETWORK INFRASTRUCTURE PROJECT COSTS RULE CHANGE REQUEST

COST ESTIMATE ACCURACY ROUNDTABLE

16 FEBRUARY 2022

AEMC

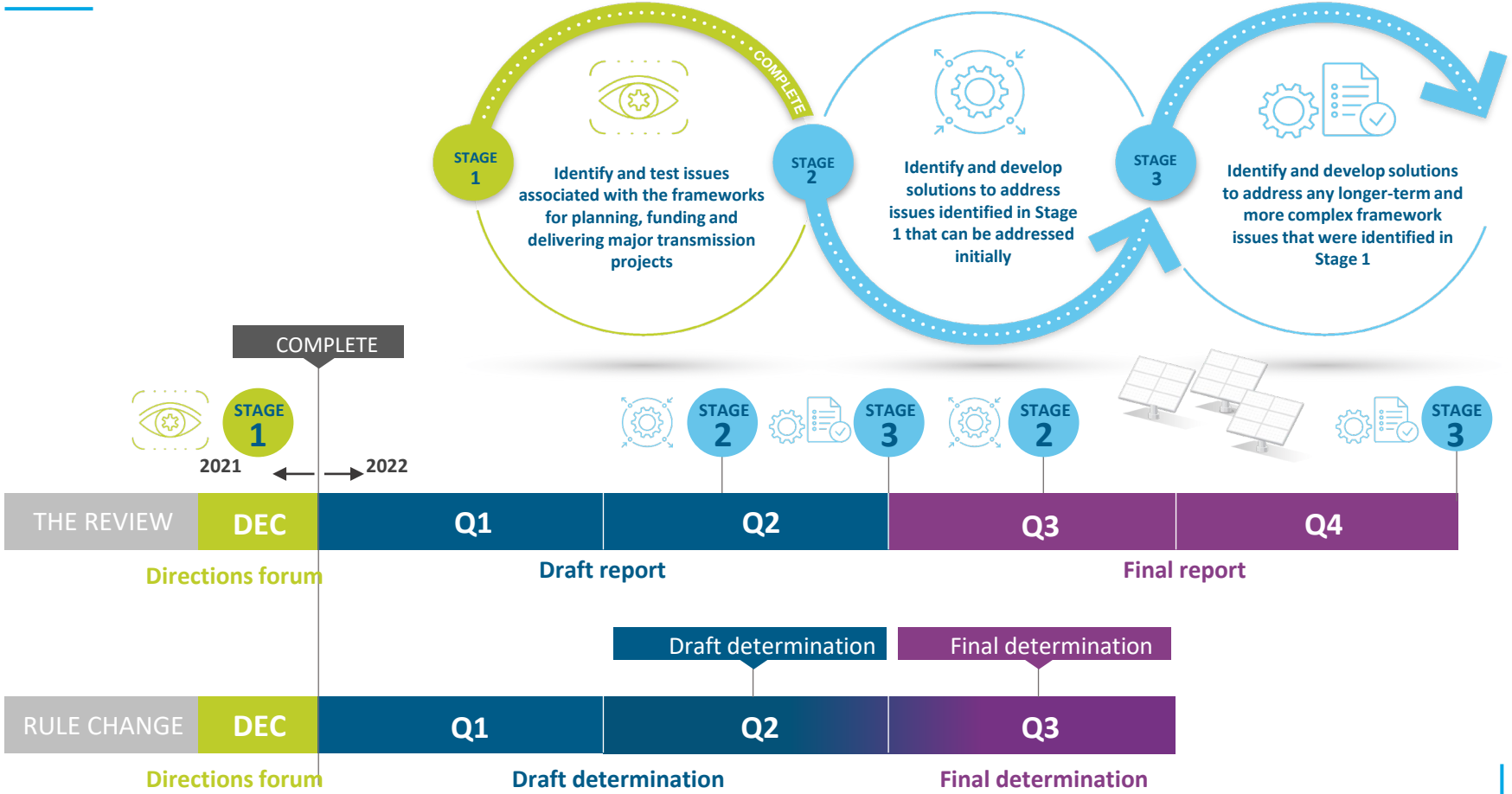
Agenda

1.	Acknowledgement of country and introduction – Alisa Toomey, AEMC
2.	The rule change request: rationale, proposed approach and recent thinking – Mark Grenning, EUAA
3.	Q&A – points of clarification only
4.	Lessons learned from the ISP and AEMO's transmission cost review – Eli Pack, AEMO
5.	Q&A – points of clarification only
6.	AER's role: CBA guidelines and contingent project assessment process – Ali Hassan, AER
7.	Q&A – points of clarification only
8.	Issues to consider in preparing the draft rule – Katy Brady, AEMC
9.	Interactive session – broader Q&A and Menti polls
10.	Closing remarks and next steps – Alisa Toomey, AEMC

ACKNOWLEDGEMENT OF COUNTRY & INTRODUCTION

ALISA TOOMEY, AEMC

Recap: the review and rule change are progressing in tandem



Purpose of today's presentation

Recap the rule change request and share latest thinking about what regulatory framework changes would help address proponents' concerns

Explore issue of cost estimate accuracy in more detail – lessons learned by market bodies and considerations to address in preparing the draft rule

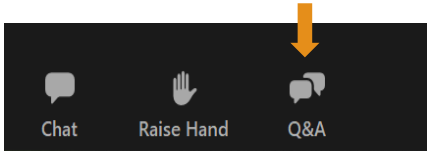
Enable forum participants to ask questions, provide comment and participate in online polls

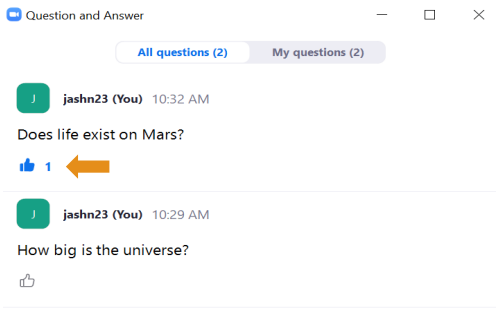
Housekeeping

- We are recording the roundtable but will not publish it. It will be used to help prepare a meeting report which we will publish, along with this presentation, on our website.
- We want to encourage open discussion so questions and comments will not be attributed in the report.
- Views expressed by AEMC staff are not Commission views.
- All participants are currently in 'listen-only' mode. Please submit questions using the zoom Q&A function and indicate which presenter you are directing your question to.
- If you wish to seek clarification or respond to an answer, please raise your hand and we will unmute you.
- Please engage respectfully.

Zoom Q&A function

- Q&A function is open throughout the webinar but please hold more substantive questions/comments until the second half of the session
  - Use the Q&A button on the bottom of your screen
- 'Upvoting' function
  - We will try to answer all questions, but will prioritise questions with most 'upvotes' first
  - We will follow up with you offline if we don't get to all questions
- 'Dismissed' queue
  - This is a Zoom term
  - We will move questions here if they are duplicates





Before we start, an important notice: Compliance with Competition Law

- The attendees must not discuss, or reach or give effect to any agreement or understanding which relates to:
  - Pricing
  - Targeting markets or customers
  - Tendering processes
  - Boycotting other parties
  - Sharing competitively sensitive information
  - Breaching confidentiality obligations

Each entity must make an independent and unilateral decision about their commercial positions.

AEMC Roundtable
Material Cost Rule Change

16th February 2022

In memory of David Headberry – one of the original rule change proponents

Outline

1. Why we proposed the rule change in January 2021 and what is was
2. A lot has happened since then to support the ‘why’
3. What is consumers’ risk appetite for a capex risk they are not best placed to bear?
4. What our rule change is not meant to do
5. The ‘how’ has developed since January 2021 – we need a package
6. What might a package of measures look like?
7. What it would it mean in practice?

While our original rule change covered both RIT-T and RIT-D, our focus here is on large RIT-T projects, especially those coming out of the ISP

Why the original rule change in January 2021? - 1

- The 2020 ISP had very little explanation of how AEMO arrived at capex costs yet its ODP was proposing $billions of network investment
  - We knew capex was rising and AEMO simply increased capex by 30% from Draft to Final ISP
  - Consumers had little confidence that the 2020 ISP ODP met the NEO
- Project Energy Connect capex increased from $1.5b (AACE Class 4 estimate of -15% to +50%) used by the AER in its 5.16.6 review to $2.4b CPA application
  - At $2.4b it would not have passed the 5.16.6 review
- The only two independent assessments of the RIT for major transmission augmentations cast doubt on the benefits claimed by the proponent(s)
  - AER 5.16.6 assessment of PEC
  - Frontier review of the Heywood upgrade
- Under the rules the project proponent determines if there has been a material change in circumstances requiring re-application of the RIT-T/RIT-D
  - That created the wrong incentive and there was little transparency around how the proponent(s) assessed material change - costs increased, but benefits always increased more
  - Consumers no longer had the comfort of 5.16.6 reviews

Why the original rule change in January 2021? - 2

- Consumers faced enormous asymmetry in resources in trying to engage with proponent(s) on complex net benefit modelling
  - So rules based consultation was more 'inform' on the IAP2 spectrum that 'involve' or collaborate'
- We needed increased transparency and independent expert oversight to give us confidence in the choice of input assumptions and outcomes coming from the modelling across the RIT-T process
- Cost for projects were increasing well above that indicated in the RIT process, yet the proponent(s) were still claiming there are net market benefits with limited evidence
- Whilst cost recovery for the proponent(s) is certain, consumers take the risk of whether the claimed benefits will occur
- What did we propose - two parts:
  - AER, and not the project proponent, determines if there has been a 'material change' post PACR/FPAR flowing from a cost increases above the 10/15% threshold
  - This increase would trigger the need to reapply the RIT-T/D unless the AER determines otherwise
- Overall aim – to restore consumer confidence that the whole end to end RIT-T/D process meets the NEO

A lot has happened since then to support the ‘why’ - 1

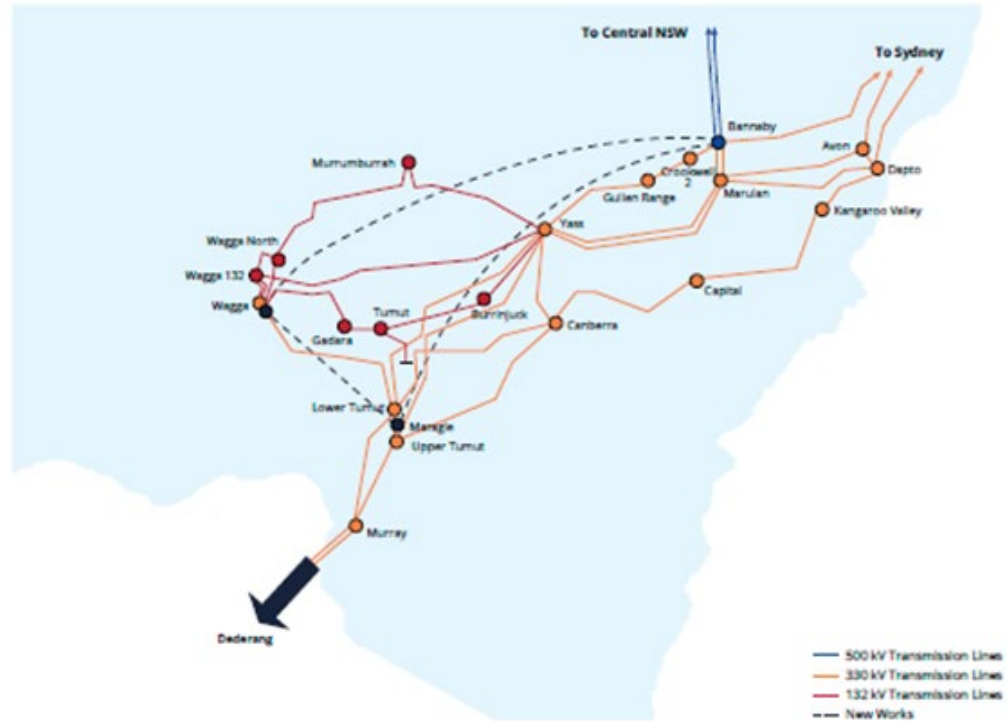
- This rule change is now part of the wider AEMC Transmission review
  - Our focus today is on larger RIT-T projects, particularly ISP projects
- First round submissions on the proposal
  - Wide support (outside networks) for the AER deciding ‘material change’
  - Wide support (outside networks) for more robust RIT cost estimates
- Final AER Guideline on the regulation of large transmission projects
  - Provides increased capex scrutiny but does not require a particular capex accuracy
  - Provides for staged CPAs to improve knowledge of costs but does not prescribe the scope or require it to result in a particular level of capex accuracy
  - Did not set out a process for the proponent to review the “preferred option” when a cost increase occurred
- Substantial work of the Draft 2022 ISP and Transmission Cost Database
  - Showed costs much more likely to go up over time as estimate accuracy improves
  - Provided transparency around the decision rules for actionable projects eg capex ’not materially above’ $3.3b for HumeLink

Much has happened since then to support the 'why'- 2

- Projects continue to experience large capex increases through the RIT-T
  - Humelink example – significant increase PADR to PACR - still only a Class 4 at PACR
- Higher cost uncertainty in network vs non-network options
  - Will the PACR preferred option still be the feedback loop preferred option?
- Concerns about modelling methodology to ensure no double counting of benefits
  - HumeLink example (see map on next slide)
- Capex increase driven by social licence and supply chain constraints
  - Delays in Western Victoria Network Project as social licence addressed – no firm start date or capex
  - Rising landowner concerns across the NEM
  - Dispute over the Humelink route selection upheld by the AER
  - ESB REZ Design Report implementation starting
  - Infrastructure Australia report (2021) - supply chain constraints/ increased costs
- Consumers are now much more aware of the greater risks they are facing, in estimation of both costs and benefits

The example of HumeLink

Figure 2.4: HumeLink preferred option



[17] FTi, Benefits of Project EnergyConnect, June 2020

What is consumers' risk appetite for a capex risk they are not well placed to bear?

- Key to the AEMC's interpretation of the NEO is that risk should be borne by the party best placed to bear it – consumers are not well placed to bear capex risk
- To say 'just build quicker' and RIT-T as an impediment means more capex risk on consumers
  - usually those who do not pay for the new network but benefit from it
- So it is about minimising the residual risk to consumers by:
  - *Avoiding* large post construction cost pass through into networks' RABs
  - *Promoting* accurate capex in the whole process to ensure only efficient and the right projects comes out of the RIT-T and feedback loop
  - *Reducing* stranded asset risk

  We focus on the first two but recognise the third is a real risk with 60 year life assets
- Consumers want to see progress in achieving net zero
  - And have confidence they are getting transparent and accurate information to enable them to decide if they are prepared to accept the capex risk they are being asked to take on

What our rule change is not meant to do

1. Delay the start of construction – that is now driven by social licence, not formal RiT-T requirements
   - Cannot start building until you have an approved route and land acquisition
   - So why not use the time taken to obtain social licence to more fully define the route and achieve a more accurate capex estimate – given a major reason for capex increase is social licence costs?
   - Why not do this during the RIT process prior to feedback loop/CPA?
   - And help mitigate over investment risk?
2. Get proponents into a 'RIT-T spiral' of having to constantly redo it when costs went up by a certain % from the costs used in the RIT CBA – ideally it should be done well first time round
3. Leave networks without the resources to provide better cost estimates - we support 'early works' to give consumers confidence on costs (and net benefits)
   - But ISP proposal for $821m for HumeLink and VNI West comes with little detail on scope and what residual risks consumers will bear at the time of CPA 2
   - What is the use of consumers risking $821m and still having only a Class 3 estimate at the end – and significant post construction pass through risk?

So the ‘how’ has developed since January 2021 - 2

- Our objective is to restore confidence in the RIT-T process to give consumers confidence that, based on the best current information, the right project will be built at the right time
  - The preferred option still delivers a net market benefit, and
  - The preferred option is the option that maximises the net market benefit
- There are different ways to achieve our objective
  - Our rule change emphasised the need to consider ‘the whole end to end process’ ie ISP to CPA to post construction cost pass through - and focussed on PACR to CPA
  - It is much better to do the analysis well the first time and not have to re-do it eg that the preferred option at PACR is still the preferred option at CPA
  - Requiring the discipline of AACE class estimates framework through the process will help to ensure the analysis is done right the first time
  - It is a combination of actions by networks, consumers and market bodies
  - The Draft ISP provides prescriptive ‘decision rules’ - but these are yet to be applied

So what could a package of measures include - 1?

- Need to look across the whole RIT-T process to meet our objective
- The right balance between prescriptive vs incentive based
- We support greater weight to prescription given:
  - The huge expenditure involved and considerable residual risk consumers bear
  - The asymmetry in knowledge between consumer and proponent(s) in engagement
  - The relatively short time provided in the RIT for analysis of significant data
- This will involve a range of measures
  - Stronger consumer engagement eg networks funding an ISP Consumer Panel equivalent for individual ISP projects with those panels having their own funding to undertake their own analysis (as for some current DNSP reset committees)
  - Stronger AER Guidelines eg ensure no benefit double counting; improved transparency of all input assumptions; sensitivity testing to give decision rules in PACR on how the preferred option would no longer be preferred; required level of cost detail
  - Stronger governance eg material change not decided by proponent(s)

So what could a package of measures include - 2?

- However, prescription on it own may not be sufficient to provide the outcome consumers are seeking
- A hybrid framework of prescription and incentives could provide confidence the NEO is being met
- AACE class estimates are viewed differently by different proponents, market bodies and stakeholders and error margins selected may still leave room for large costs increases including at the end stages in the process
  - Different approach of GHD (ISP TCD) and AACE in accuracy bands
- Network and non-network options may be unfairly compared resulting in the “right project” not being selected
- The incentive of the “cost increase threshold trigger” may still have an important role
  - It can effectively align the error margin chosen across all proponents, all projects and all options
  - Proponents have the choice of what cost estimate they use in their CBA, using a lower cost with a higher error margin may risk breaching the “trigger”
  - Proponents bear the risks of their decisions in the RIT CBA process
- Preferred outcome would be that the “trigger” is never used, but would be there if needed

So what would this mean in practice?

1. No delay in the current timetable for assessing investments
   - that is driven by social licence, not by any requirements on capex accuracy - Exhibit 1 is Western Victoria Transmission Network Project
2. Consumers having quality information available to be better informed on the risk they are being asked to bear around over/under investment and confidence on the ISP and energy transition pace
   - Confidence that the right project is being developed with the right market timing, and
   - Confidence that the proposed project will deliver a realisable net market benefit

   so much better NEO alignment
3. Governments retaining the ability to contribute the required funds to have a project built sooner than the ISP/feedback loop says is efficient
   - eg for HumeLink if the decision rule means the project does not pass the feedback loop at >$3.4b but the capex at the end of early works is $4b, then
     - Government should fund $0.6b to allow the project to proceed
     - $3.4b goes into Transgrid's RAB

QUESTIONS?

Cost Estimate Accuracy Roundtable

Eli Pack – Manager Integrated System Planning

16 February 2022

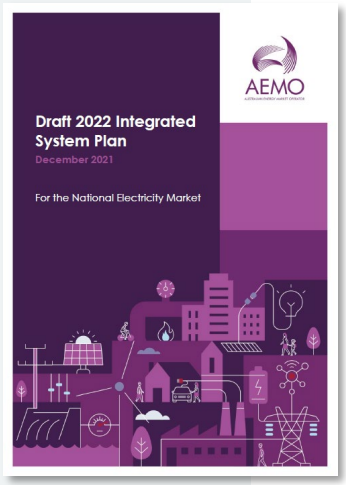
AEMO

AUSTRALIAN ENERGY MARKET OPERATOR

Agenda

1. The Integrated System Plan (ISP)
2. A brief history of transmission cost estimation
3. The AACE framework can improve consistency and rigour
4. The 2021 Transmission Cost Review improved transparency
5. Lessons learned in the 2022 ISP

The Integrated System Plan (ISP) is a whole-of-system plan



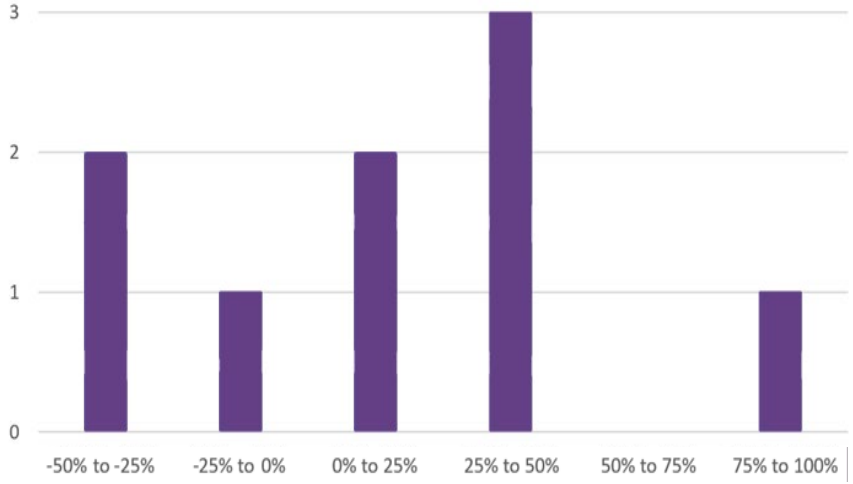
- **Whole-of-system** plan
- Informs policy makers, investors, consumers, researchers and other energy stakeholders
- Serves regulatory purpose of justifying actionable and future new transmission
- Maximises value to end consumers
- Optimal development plan/roadmap

Large-scale transmission investment was in hibernation

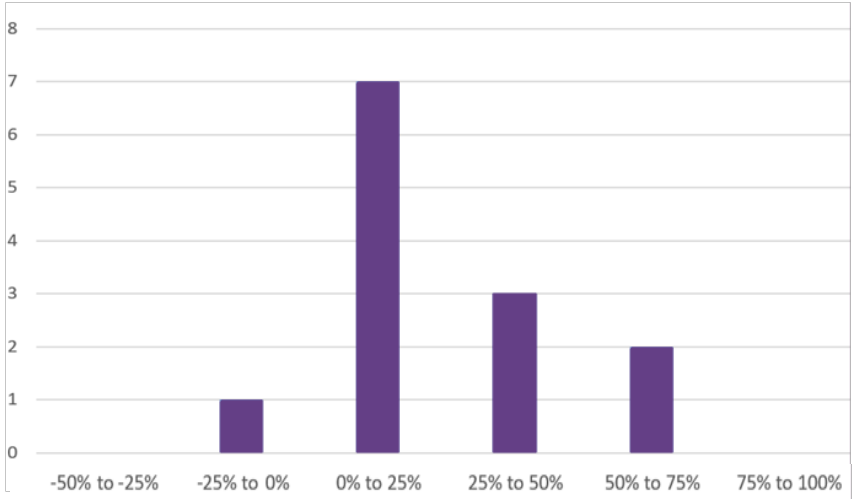
- New large-scale transmission projects had limited data for benchmarking.
- From 2019 to 2020, major project cost estimates increased by approximately 30%.
- Common flaws were identified in estimates, including:
  - **Risk contingencies** were not evaluated or included.
  - **Social licence** was not well understood or evaluated.
  - **Escalation of costs** for labour, materials or equipment was excluded.
  - **Assumptions on ground quality** were optimistic.
  - **Maintenance costs** and the need for spares was excluded.
  - **Brownfield work** was not well scoped.
  - **Project staging** was not investigated.
- In response to feedback on the 2020 ISP, AEMO initiated the 2021 Transmission Cost Review.

The majority of cost estimates increase over time

Substations



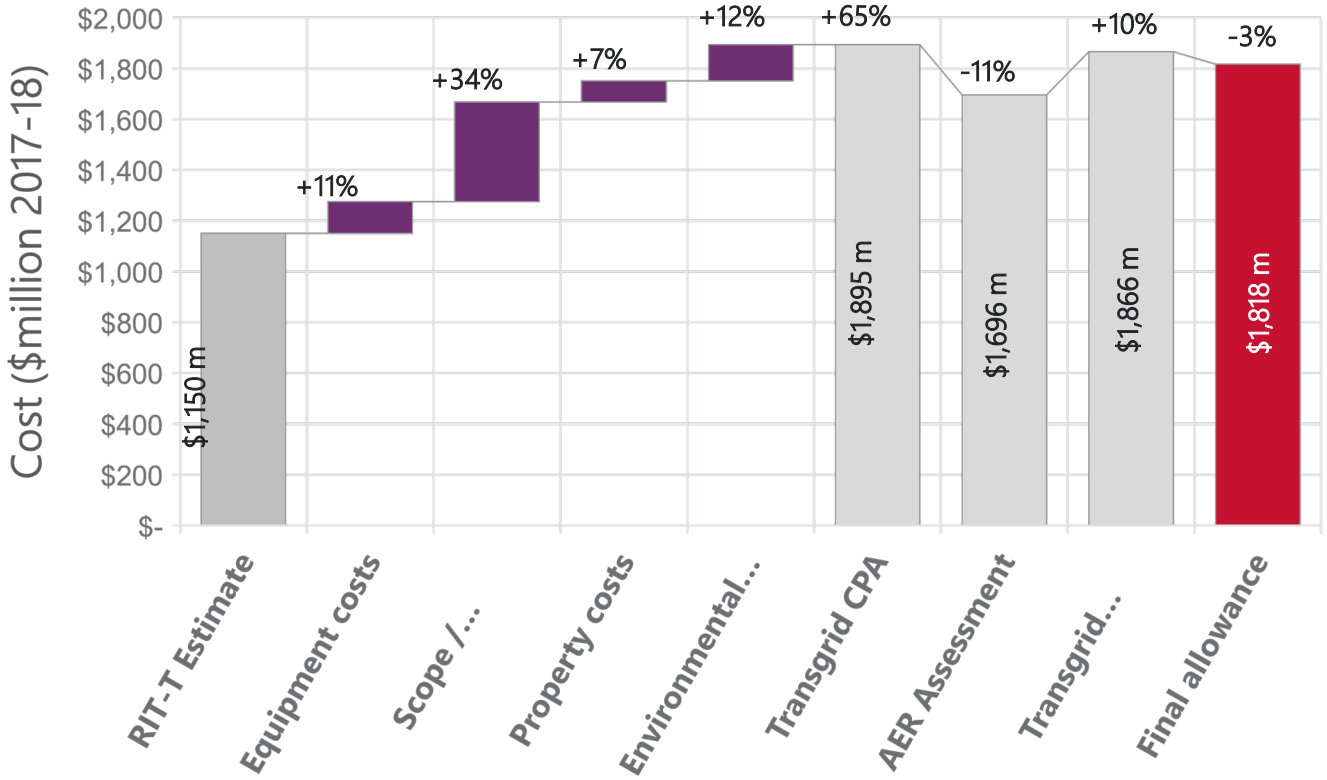
Transmission Lines



Source: GHD – ISP Transmission Cost Database

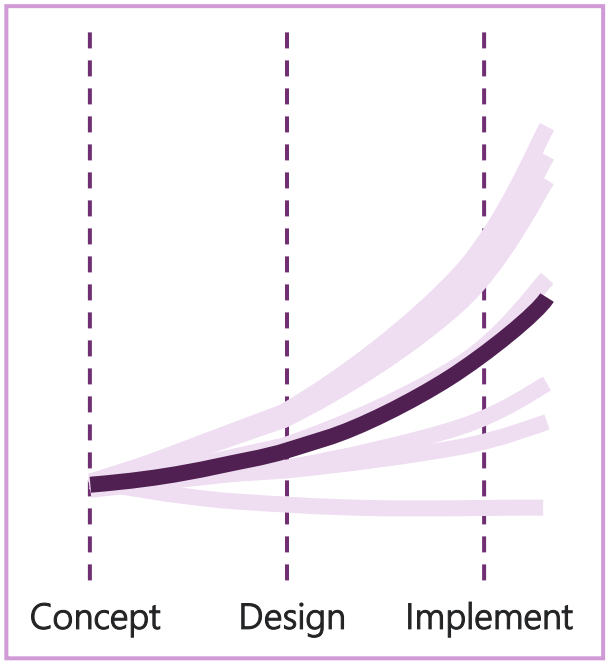
**Increases shown are from PADR to CPA*

NSW costs for PEC increased by 58% after the RIT-T

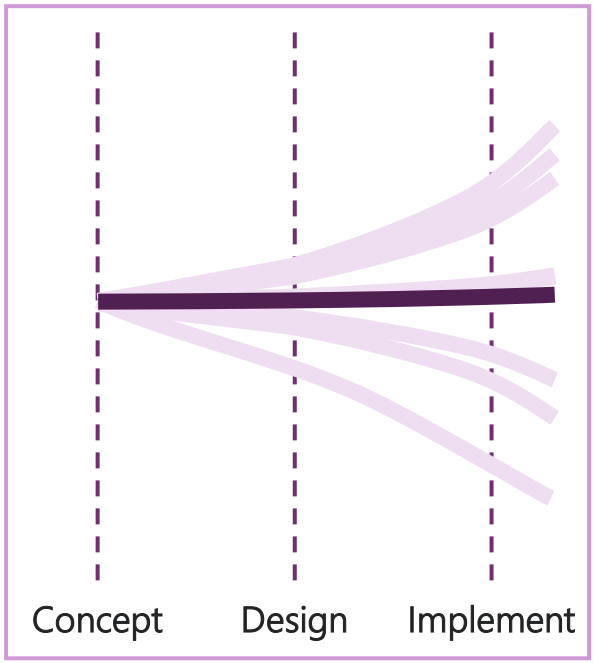


We needed better cost estimates

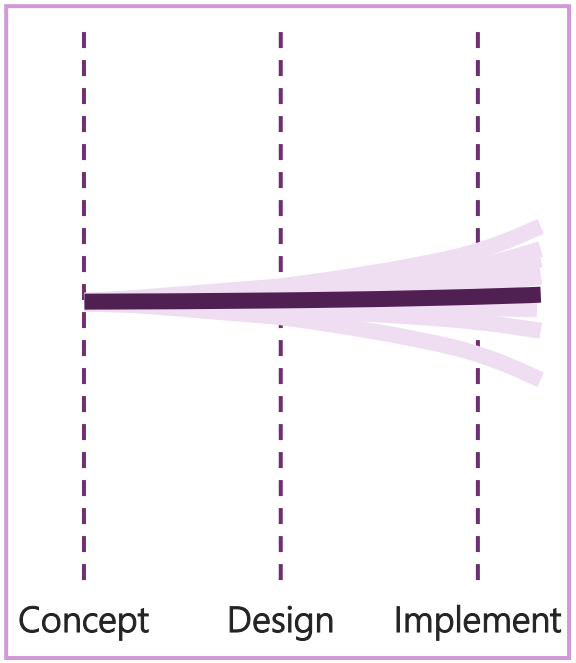
We had low estimates



We want them to stabilise



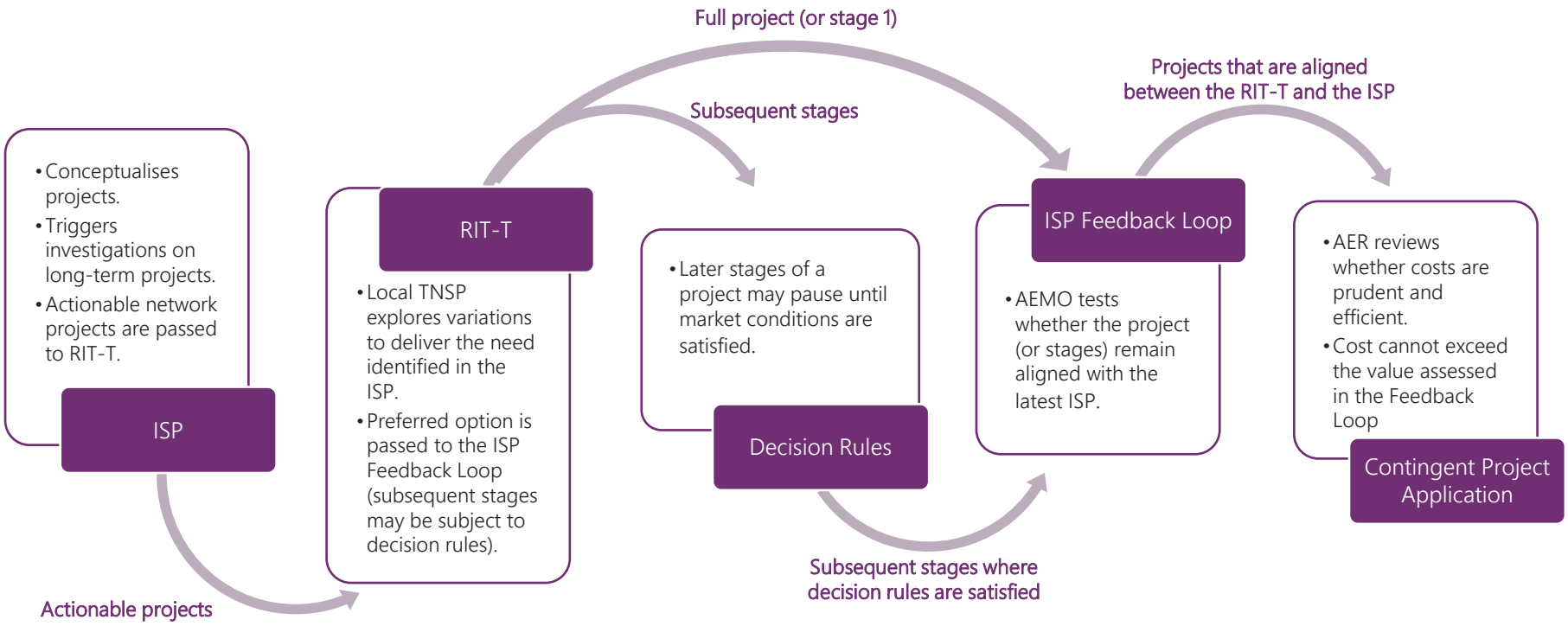
...and more accurate



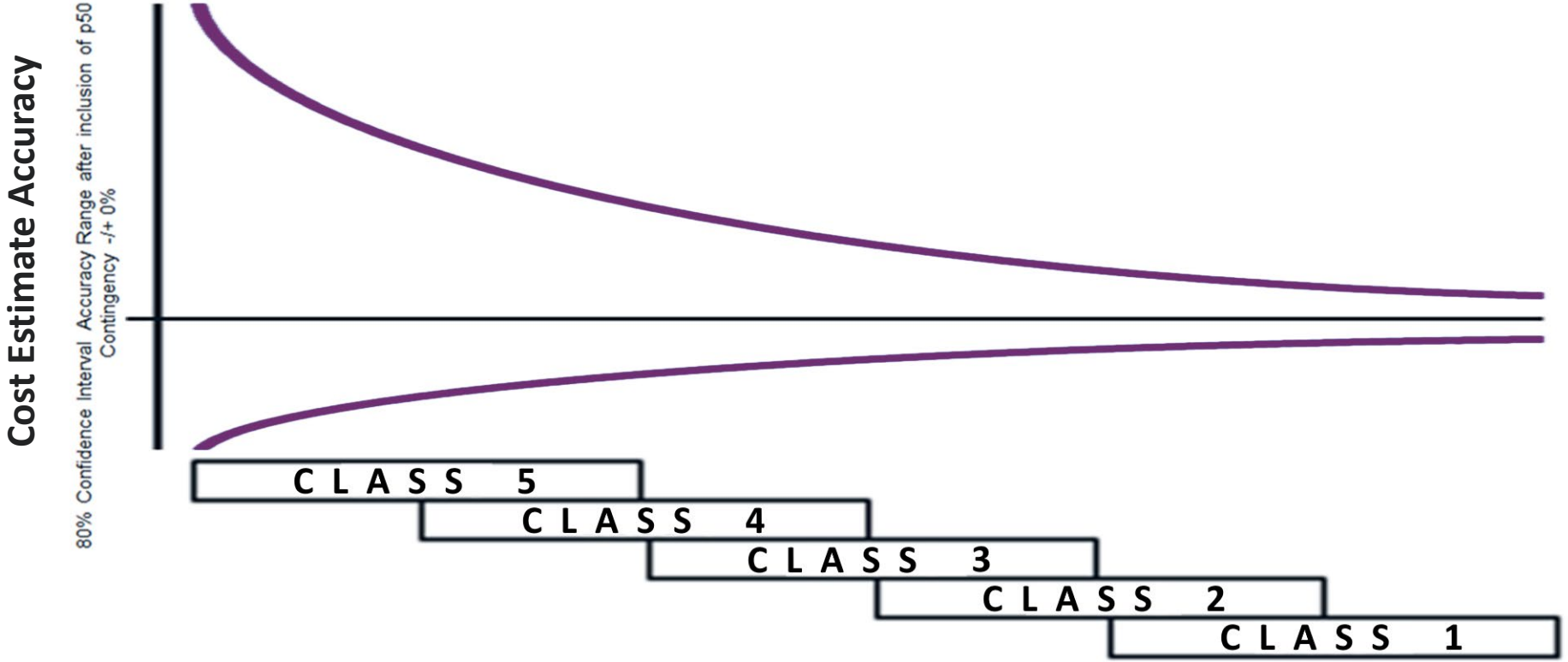
Add risk offsets

Add rigour

Projects mature throughout the regulatory framework



AACE can be used to standardise cost estimates

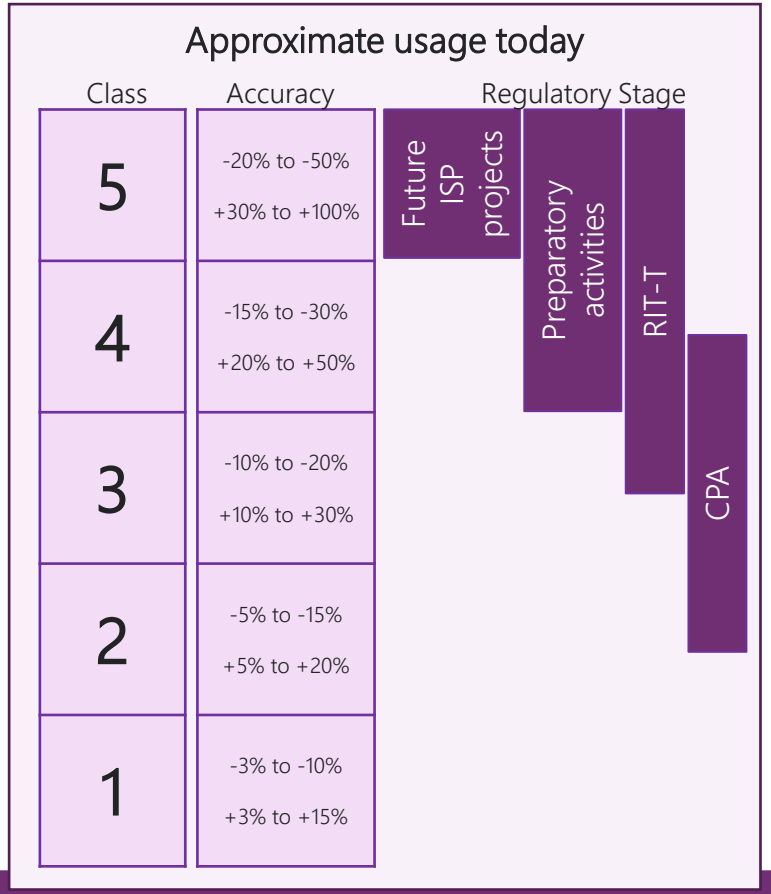


Source: AACEI.org

AACE classes are aligned with our regulatory framework

AACE classes are used where possible in the ISP but are not formally part of the regulatory framework:

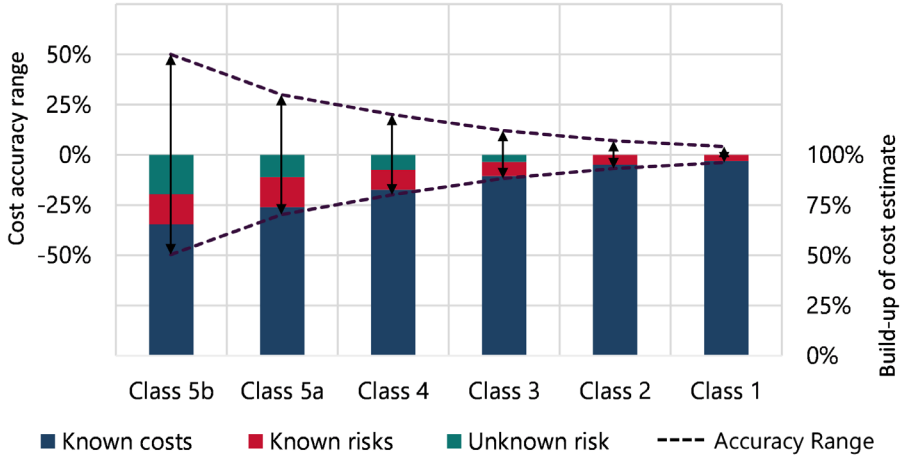
- **Class 5** – Project is conceptual and costs are used for screening.
- **Class 4** – Used for economic feasibility and preliminary budget approval.
- **Class 3** – Typically used for full funding requests. Land and procurement in process with some firm quotes. Usually only one option at this level because it can be costly to reach this stage.
- **Class 2** – Land and easement typically finalised, permits mostly obtained, contracts and construction in progress.
- **Class 1** – Used to manage active contracts, disputes, change management, negotiations.



* Note: The class levels here reflect AEMO's current understanding of levels typically used at each stage. AEMO expects that CPA submissions will not include allowances for unknown risk.

We applied AACE wherever possible in the ISP

- The application of AACE cost estimates depends on stakeholder risk attitude and tolerance.
- The ISP used the AACE system, and then applied risk margins to reflect a limited tolerance for cost under-estimation.
- Class 5 (conceptual) was split in two to clearly group estimates at the upper and lower end of the class range.
- Some projects were not classified due to confidentiality claims.
- We ran sensitivities on the upper-end of the cost accuracy range.



Note: These accuracy ranges deviate from AACE because they include offsets for unknown risk.

We consulted on the Transmission Cost Report

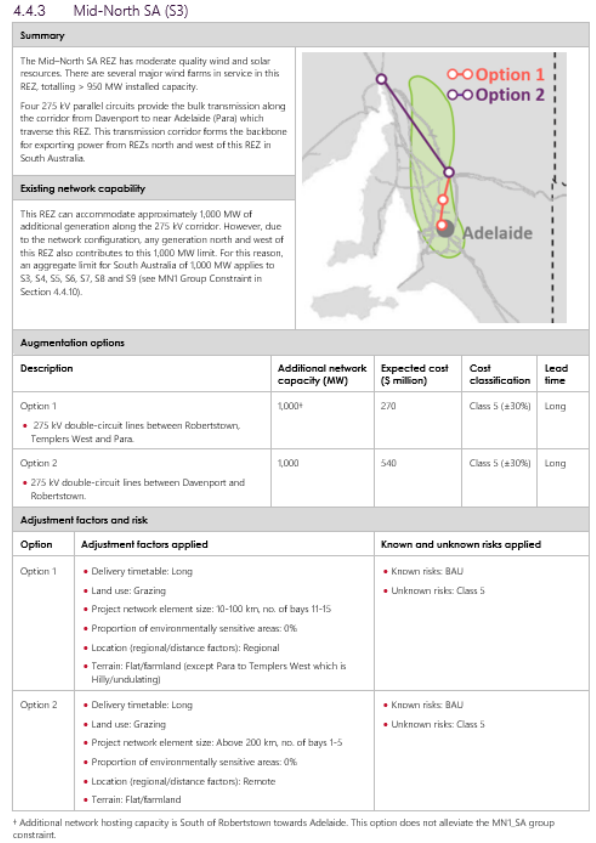
The *2021 Transmission Cost Report* forms part of the 2021 *Inputs, Assumptions and Scenarios Report* (IASR)

It presents a summary of the design, capacity and cost estimate for candidate transmission projects for the 2022 ISP.

Feedback from stakeholders on the draft is included in the 2021 IASR Consultation Summary Report.

The 2021 Transmission Cost Report is detailed

- Methodology
  - Cost estimate stages and risk approach
  - Transmission Cost Database
  - Review of TNSP estimates
- Project data:
  - Augmentation options
  - Network capacity
  - Project cost
- Generator connections
  - Connection cost
  - System strength remediation



4.4.3 Mid-North SA (S3)

Summary

The Mid–North SA REZ has moderate quality wind and solar resources. There are several major wind farms in service in this REZ, totalling > 950 MW installed capacity.

Four 275 kV parallel circuits provide the bulk transmission along the corridor from Davenport to near Adelaide (Para) which traverse this REZ. This transmission corridor forms the backbone for exporting power from REZs north and west of this REZ in South Australia.

Existing network capability

This REZ can accommodate approximately 1,000 MW of additional generation along the 275 kV corridor. However, due to the network configuration, any generation north and west of this REZ also contributes to this 1,000 MW limit. For this reason, an aggregate limit for South Australia of 1,000 MW applies to S3, S4, S5, S6, S7, S8 and S9 (see MN1 Group Constraint in Section 4.4.10).

Augmentation options

Description	Additional network capacity (MW)	Expected cost ($ million)	Cost classification	Lead time
Option 1 • 275 kV double-circuit lines between Robertstown, Templers West and Para.	1,000†	270	Class 5 (±30%)	Long
Option 2 • 275 kV double-circuit lines between Davenport and Robertstown.	1,000	540	Class 5 (±30%)	Long

Adjustment factors and risk

Option	Adjustment factors applied	Known and unknown risks applied
Option 1	• Delivery timetable: Long • Land use: Grazing • Project network element size: 10-100 km, no. of bays 11-15 • Proportion of environmentally sensitive areas: 0% • Location (regional/distance factors): Regional • Terrain: Flat/farmland (except Para to Templers West which is Hilly/undulating)	• Known risks: BAU • Unknown risks: Class 5
Option 2	• Delivery timetable: Long • Land use: Grazing • Project network element size: Above 200 km, no. of bays 1-5 • Proportion of environmentally sensitive areas: 0% • Location (regional/distance factors): Remote • Terrain: Flat/farmland	• Known risks: BAU • Unknown risks: Class 5

† Additional network hosting capacity is South of Robertstown towards Adelaide. This option does not alleviate the MN1_SA group constraint.

We used a checklist to classify projects

	Class 5	Class 4	Class 3	Class 2/1
Scope of Works - line, station, cable				
Voltage defined?	Yes	Yes	Yes	Yes
Rating (MVA, MW, MVAr) defined?	Yes	Yes	Yes	Yes
Conductors specified?	Yes	Yes	Yes	Yes
Connection locations (substation, terminal station, converter) defined?	Yes	Yes	Yes	Yes
Which option best describes the maturity of the routing?	Preliminary Corridor	High Level Route	Detailed Route	Detailed Route
Has gas network avoidance measures been included?	No	No	Yes	Yes
Which option best describes the consideration of national parks?	None	High Level	Detailed	Detailed
Which option best describes the consideration of cultural heritage?	High Level	High Level	Detailed	Detailed
Which option best describes the consideration of environmentally sensitive areas?	High Level	High Level	Detailed	Detailed
Underground lines defined?	No	No	Yes	Yes
Which option best describes the maturity of the design?	Concept/High Level	Preliminary	Detailed/Complete	Detailed/Complete
Which option best describes the documentation prepared?	Conceptual Single Line Diagram	Detailed Single Diagram	For Construction/Civil Diagrams	For Construction/Civil Diagrams
Level of site investigation for stations/substations/converters/terminal stations?	Desktop	Desktop	Preliminary Site Investigation	Detailed Investigation
Has site remoteness been incorporated into the scope of works?	Yes	Yes	Yes	Yes
Which option best describes the geographical location of any stations/substations include	Assumed	General Area Defined	Actual Location Defined	Actual Location Defined
Which option best describes the tower design progress?	Assumption Based	Preliminary Design	Final Design	Final Design
Sites				
Are there any environmental offsets included based on past experience?	Yes	Yes	Yes	Yes
Strategy/approach developed to refine environmental offsets complete?	Yes	Yes	Yes	Yes
Are outage restrictions (specific to line diversions and cut ins) considered?	No	No	Yes	Yes
Which option best describes the consideration of brownfield works across the project?	None	Indicative	Indicative	Detailed/Complete
Terrain assessment	Desktop	Detailed	Detailed	Detailed
Which option best describes the current level of engagement with landowners?	None	None	Community Level	Land Owner Level
Project Management and Delivery				
Which option best describes the level of geotech assessment?	None	None	Desktop Assessment	Detailed Assessment
Which option best describes the source of cost estimate for equipment and construction	Previous Projects	Single In-house Price	Multiple Quotes	Fixed Contract
Which option best describes the identification and assessment of risk progress?	Concept/High Level	Preliminary	Preliminary	Detailed/Complete
Has macroeconomic influence been factored into the assessment of risk?	Yes	Yes	Yes	Yes

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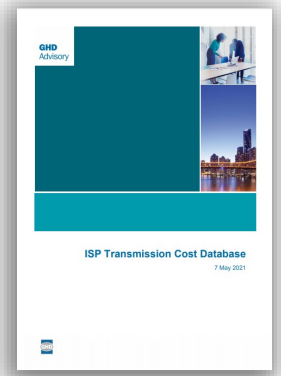
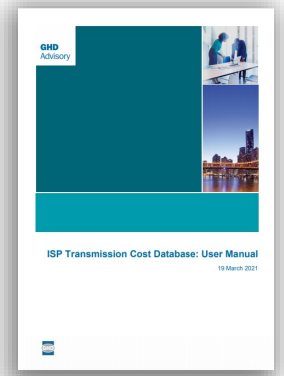
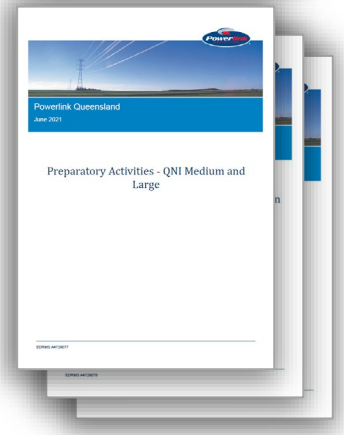
We published a lot of information







TRANSMISSION COST DATABASE

TRANSMISSION COST ESTIMATES

Link: Consultation web page

…and we had a lot of challenges.

- **Expectations** – Different stakeholders expect different levels of accuracy and rigour.
- **Consistency** – Different TNSPs use different cost estimation systems.
- **Application** – There is no clear requirement to apply and test a cost estimate consistently or explore specific sensitivities.
- **Transparency** – There is no requirement to publish cost estimate accuracy, component costs or the treatment of risk – even for preparatory activities.
- **Commercially sensitive information** – There are challenges relating to price forming, price fixing, and commercial tendering.
- **Social licence** – Impacts on timeline, cost and feasibility remain uncertain.
- **Supply chain risks** – Worldwide growth in renewables due to emission reduction targets will create competition for labour and materials.

For more information

please visit www.aemo.com.au

AEMO

AUSTRALIAN ENERGY MARKET OPERATOR

QUESTIONS?

AER's role - CBA guidelines and contingent project assessment process

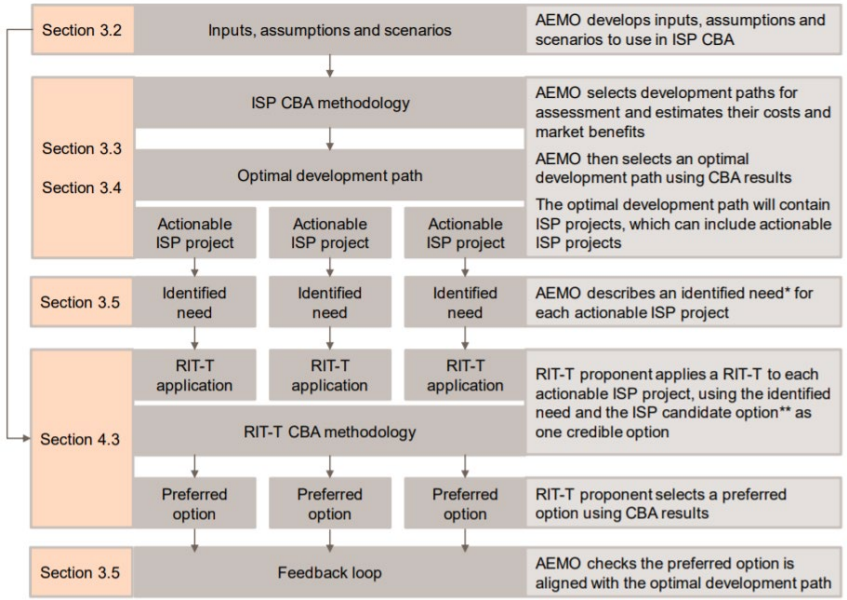
Cost estimate accuracy roundtable

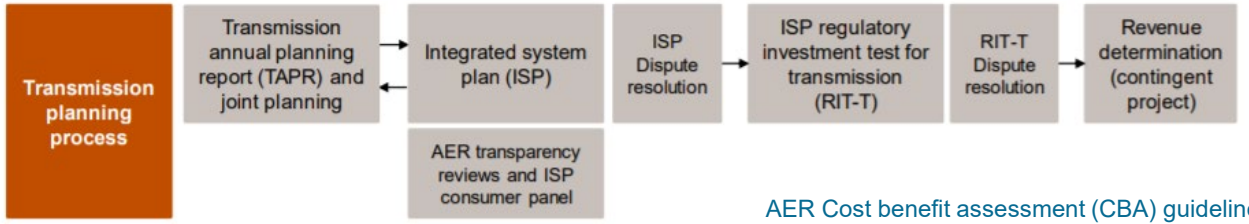
16 February 2022

AER views to date on the rule change

- In the AER's submission to the TPI Review consultation paper in September 2021, the AER made the following comments on the rule change request:
  - We agree increasing cost estimates is a concern
  - This issue is best considered in reviewing the planning framework as a whole
  - There is merit in allowing the feedback loop process to mature, to properly understand its effectiveness, as it has only been introduced relatively recently

Actionable ISP transmission planning process





ıer.gov.au

AER Cost benefit assessment (CBA) guidelines, 2020

Treatment of costs in RIT-T process

- The RIT–T instrument specifies that costs are the present value of a credible option's direct costs.

- Classes of costs that a RIT-T proponent must quantify include:
  - Costs incurred in constructing or providing each credible option.
  - Operating and maintenance costs in respect of each credible option.
  - Costs of complying with relevant laws, regulations and applicable administrative requirements in relation to the construction and operation of each credible option.
  - Any other class of costs that the RIT–T proponent determines to be relevant

- Where there is a material degree of uncertainty, RIT-T proponents required to calculate expected cost of credible option under range of cost assumptions

- As a best industry practice, RIT-T proponents are encouraged to adequately explain the cost assumptions used including undertaking sensitivity analysis to test the robustness of the credible options assessed

Feedback loop and Contingent project assessment CPA process

- Prior to the CPA stage for an actionable project, feedback loop stage acts as a gate keeper- ensuring the cost of the preferred option does not change the status of the actionable ISP project as part of the optimal development path.

- Intent behind feedback loop stage to encourage RIT-T proponents to undertake robust analysis including firming up capital costs of preferred option prior to submission of the CPA.

- AER's CPA process does not review the options analysis undertaken at the RIT stage. However, it does review and determines the prudency and efficiency of capital and operating costs of the preferred option.

Recent RIT-Ts

- Historically, fewer projects of significant capital costs similar to magnitude of recent actionable projects e.g. Project Energy Connect, Humelink etc.

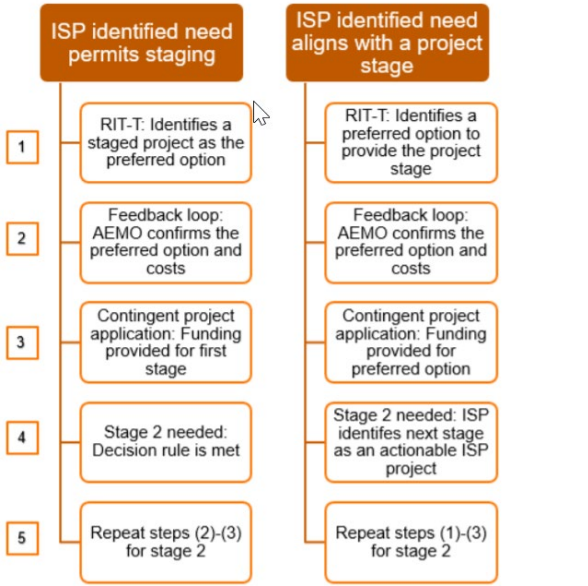
- In the case of PEC, significant capital cost increases of the preferred option were seen between RIT-T and CPA stages.

- However, AER's 5.16.6 assessment required ElectraNet/TransGrid to consider its obligations under cl. 5.16.4 (z3-z5) (material change in circumstances) before submitting CPA.

CBA guidelines- Staged projects under the ISP framework

- Intent behind staging is to avoid inefficient investments and to ensure robust analysis is undertaken to justify network investments.
- Allows for early works to be undertaken for large transmission investments before being committed.
- Subsequent stages may not occur if the information or conditions presented in the decision rule do not eventuate.

Figure 4: Progression of staged actionable ISP projects



Cost benefit analysis guidelines

Questions?

ISSUES TO CONSIDER IN PREPARING THE DRAFT RULE

KATY BRADY, AEMC

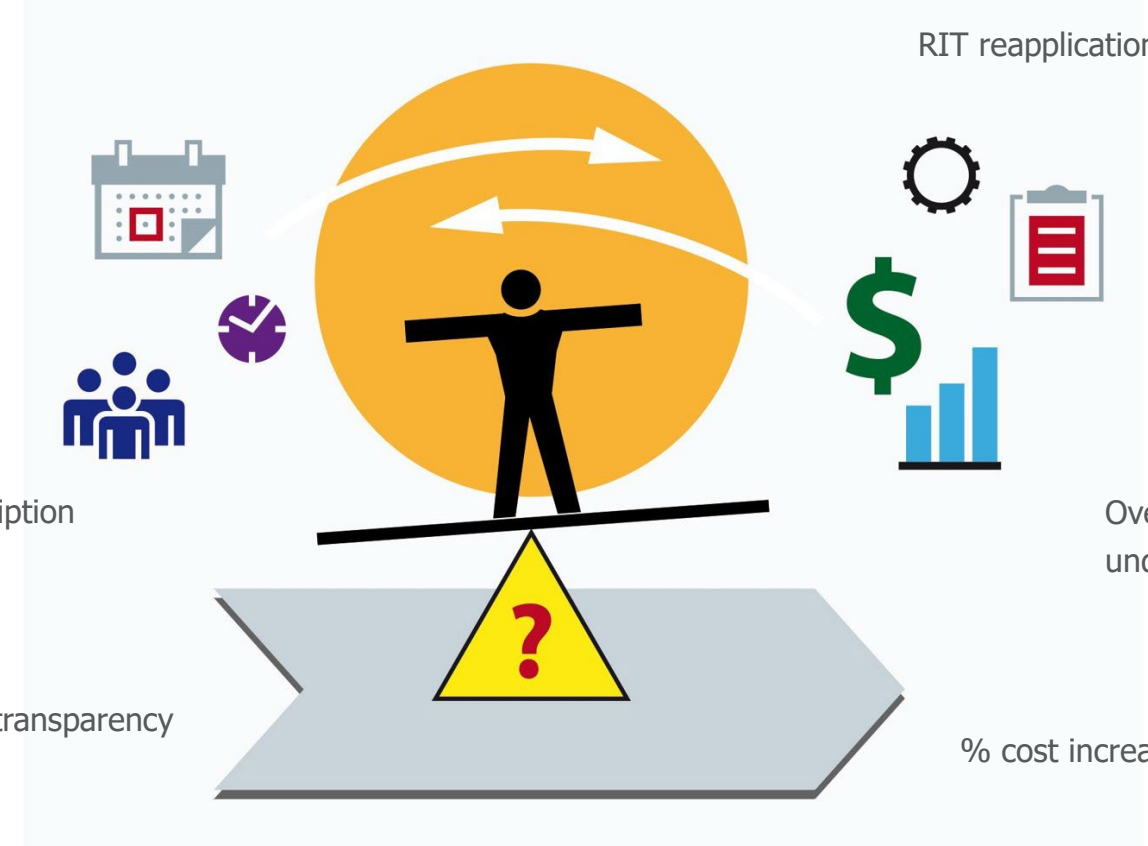
AEMC staff have developed this slide pack to inform discussion at the Roundtable. Please note that the views contained in this slide pack are indicative and have been developed by AEMC staff for consultation purposes only. They are therefore subject to change.

Balancing competing interests and considerations

NSP vs consumers

RIT reapplication vs do it well 1st time

Rigour vs timeliness



Opex now vs capex later

Incentives vs prescription

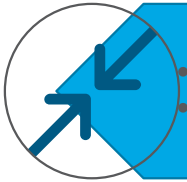
Over/early investment vs under/late investment

Discretion vs transparency

% cost increase vs decision rule approach

NSP or AER to determine material change in circumstances?

A balance is required between interests of networks and interests of consumers



- NSPs want certainty they will recover costs, have an incentive to include assets in RAB
- Consumers bear cost of transmission investments (unless governments contribute), scale of investment now contemplated is without recent precedent

Regulatory framework needs to protect long term interests of consumers while ensuring NSPs can recover at least their efficient costs

Framework needs to balance risk of over- or early investment vs under- or late investment as both can have adverse impacts on consumers

Today we want to outline our preliminary thinking on how this could be achieved and seek your views

Do RIT well once vs "analysis paralysis"

Stakeholders have expressed concern that RIT reapplication requirement could lead to analysis paralysis → higher costs to consumers from delay, under-investment risk

Alternative approach: require cost estimates to be prepared well 1st time; only require RIT reapplication in exceptional cases → better aligns with stakeholder interest in streamlining the regulatory framework

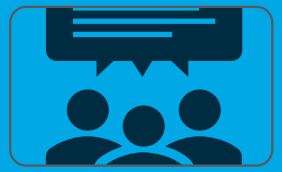
We recognise this is not just a matter of bringing forward costs that would have been incurred anyway: appropriately robust analysis at RIT stage requires consistent analysis of all key credible options to enable like for like comparison

As planning costs will be passed through to consumers, key question is: how much should be spent upfront (on better estimates) to avoid higher costs down the track (resulting from capex spent on inefficient projects), having regard for …

→ Risks of over-investment vs under-investment, and

→ Different ways that opex and capex are recovered from consumers

Improving the rigour, consistency of cost estimates



AACE recommended practice provides guidance only – there is a range of views about what each class entails and what error margins are appropriate (AACE, GHD, NSPs…)

Important question is how robust should estimate of base costs be (versus risk allowances added to that base cost) to allow parties to identify the most efficient option?

Alongside AACE guidance, do we also need to

→ mandate good practices (so they are consistently adopted) and

→ proscribe poor practices (to address omissions, double counting etc)

in order to promote consistent and reasonably robust cost estimates?

For large ISP projects, land related costs are a key factor in cost increases → more work is likely needed at RIT stage to facilitate identification of most efficient option… but how much is enough?

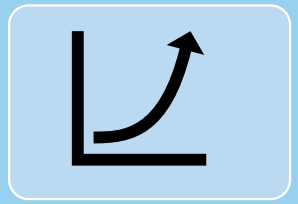
Considerations in developing the draft rule

In developing the draft rule, we need to consider the purpose of the RIT which (unless the project is for "reliability corrective action") is:

→ that the preferred option is net beneficial AND

→ that the preferred option maximises net market benefit: i.e. is the most efficient way to address the identified need

Discussion sometimes focuses on 1 over 2 – we need to consider both in order to protect long term interests of consumers

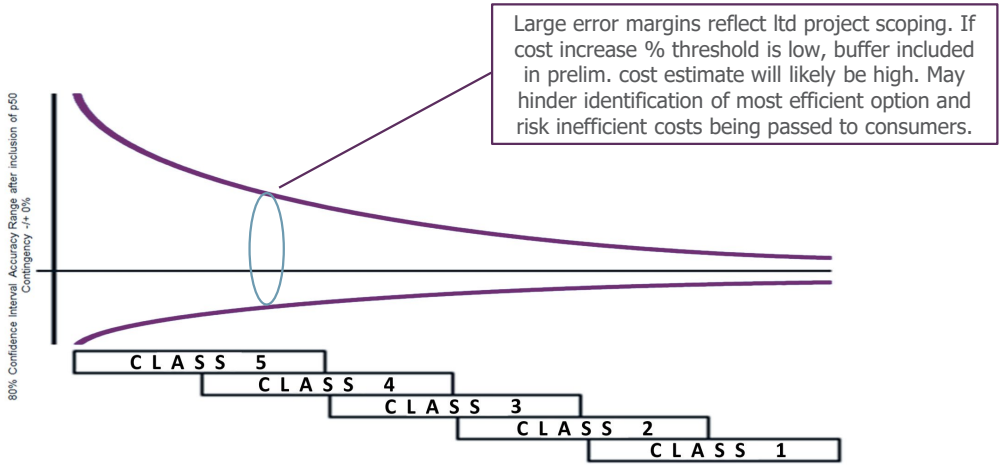


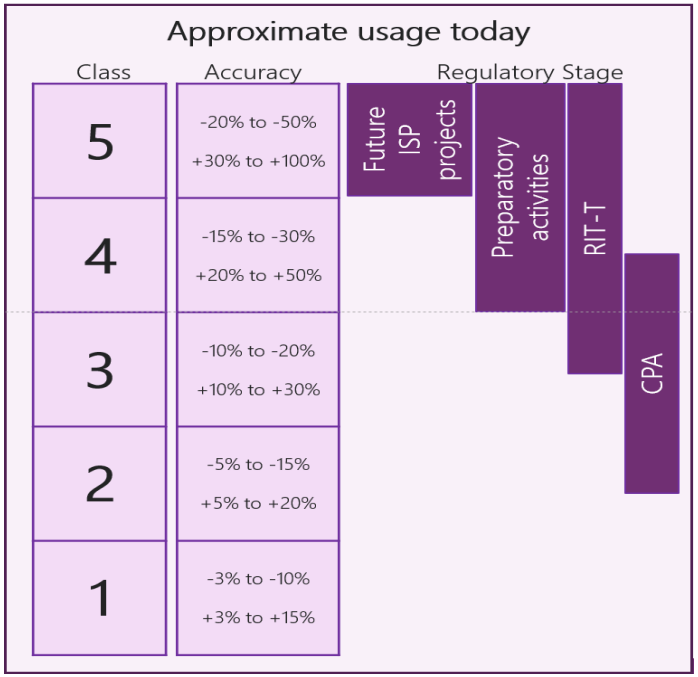
We also need to avoid creating new problems:

→ e.g. incentivising NSPs to over-estimate costs at RIT stage by including large buffers to manage risk of triggering RIT reapplication requirement

→ need to strike appropriate balance between rigour and timeliness to mitigate under/late investment risks

Concern raised was cost under-estimation, care needed to avoid over-estimation





- Real life does not follow neat "cone of uncertainty" – actual costs may lie somewhere within error margins or well outside them
- We need enough confidence in base cost estimate that we can identify the most efficient option with reasonable confidence (e.g. require good class 4 estimate with all key inputs identified and no gaps?)

What effect might a cost increase threshold have in practice?

To protect its financial position while avoiding RIT reapplication, rational NSP may prepare preliminary cost estimate and use buffer to estimate cost at level which is high enough to accommodate potential cost increases at CPA stage but not so high that benefits are insufficient.

This may not help identify most efficient option → risks inefficient costs being passed to consumers. Could also increase pressure on AER to ensure cost in CPA is prudent and efficient.

This is an important consideration in deciding what approach to use (incentives, prescription or both) and level of any cost increase threshold. 10% provides limited wiggle room at CPA stage – creating incentive to include large allowances in RIT cost estimate.

Focus on cost increase trigger may mean that the project taken forward is net beneficial but it may not be the option which *maximises* net benefit/is *most efficient*.

We need to address 1 **and** 2 in order to protect long term interests of consumers: i.e. project is beneficial and is most efficient option. Hence a mix of incentives and prescription may be the better approach.

Would a mix of approaches improve cost estimate practice?

AEMO identified common flaws in estimates, including:

- Risk contingencies were not evaluated or included.
- Social licence was not well understood or evaluated.
- Escalation of costs for labour, materials or equipment was excluded.
- Assumptions on ground quality were optimistic.
- Maintenance costs and the need for spares was excluded.
- Brownfield work was not well scoped.
- Project staging was not investigated.

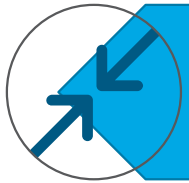
A mix of overarching guidance and specific requirements may better promote reasonably accurate, consistent cost estimates.

For example:

- require NSPs to address all key cost inputs in AEMO transmission cost report appendix, including early identification of land related costs, and allowances for contingencies
- require sensitivity testing and boundary values to be identified for key inputs to inform development of decision rules
- proscribe double counting of benefits across multiple RITs
- require justification of any market modelling approaches (e.g. re network constraints) where these may amplify benefits
- require CE sign off on RIT compliance, confirmation of RIT currency – similar to EPA licence requirements.

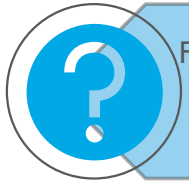
Absent clause 5.16.6 determinations, NSP compliance with framework is critical to protect consumer interests – both on completion of RIT and at point of submitting CPA.

Cost increase threshold vs decision rule approach



A cost increase is clear and readily discernible but may not of itself change ranking of options → a blunt approach.

Decision rule approach would allow more nuanced analysis, targeting the factors that will change option ranking in each case (not a "one size fits all" approach).



For example, if cost of preferred option goes up by X%, cost of another credible option falls by Y%, and/or benefits fall/rise by Z%

→ option ranking will change

Revised AER guidelines could require NSPs to include decision rules in PADR, consult with stakeholders, and finalise in PACR. Would strengthen existing requirements in AER Guidelines to *consider* doing sensitivity analysis and *discretion* to illustrate boundary values

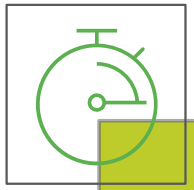
This approach requires NSPs to accommodate uncertainty proactively rather than reactively via RIT reapplication. Proactive approach is appropriate given scale and pace of change.

Would also allow NSP to submit CPA for another option without reapplying the RIT (currently this is not possible without RIT reapplication).

NER vs guidelines, RIT vs whole framework

Changes to NER supported by stronger AER guidelines

- Current thinking: amend elements of framework in the NER with supporting detail in revised AER guidelines.
- Focus is not just on RIT but on whole framework.
- As AEMO said in its submission, "consideration should be given to the value in having clear regulatory requirements for cost estimation accuracy in the ISP, preparatory activities, REZ design reports, RIT-Ts, feedback loops and CPAs".

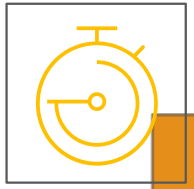


Holistic approach needed to protect consumers

- Having regard for whole framework is important because:

→ISP determines what is tested in the RIT (and can exclude options)

→ CPA is last step to protect consumers (reliance on cost pass throughs to address cost uncertainty at CPA stage will adversely impact consumers if project is not beneficial/optimally efficient)



Increasing transparency

- Other changes to strengthen framework are being considered. For example:

→ require NSPs to provide AEMO with planning data that can be used in preparing the ISP (to help improve accuracy of ISP cost estimates)

→ require NSPs to undertake post-implementation review (~5 yrs later), report on actual costs and benefits … will inform future RITs (noting that benefits should not be claimed twice) and development of future ISPs

Governance – who decides if RIT remains current?

CPA process identifies efficient cost of building preferred option – not whether that option is still the most efficient one. This is the domain of the RIT and "material change" provisions.

If things have materially changed and preferred option is no longer beneficial and the most efficient option, it should not proceed because it will impose inefficient costs on consumers.

Current framework relies on NSP forming the reasonable opinion that circumstances have materially changed in order to trigger RIT reapplication requirement. This has not occurred to date, despite significant cost increases on some projects.

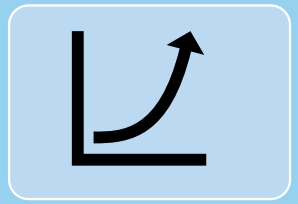
To protect consumers, this element of the framework likely needs to be strengthened. Most submissions supported AER taking on the role of determining whether there has been a material change in circumstances (i.e. whether RIT remains current).

How might stronger governance work in practice?

For large contingent projects (e.g. >$100m), NSP could be required to submit "RIT currency check" (just prior to CPA) to:

→ confirm that RIT's option ranking remains current (i.e. decision rules have not been triggered/contemplated changes have not come to pass) OR

→ advise that decision rules have been triggered and another credible option is being taken forward to CPA



If NSP wishes to proceed with preferred option despite decision rules being triggered, or if project costs have increased by more than X% ("safety net trigger"), NSP could be required to publish modelling to demonstrate why option should proceed, and to seek input from stakeholders.

Level of safety net trigger would need to be greater than 10% given correlation between size of threshold and size of cost buffer included in response… 30%?? Will also need to have regard for decision re appropriate RIT cost estimate class.

As a last resort in exceptional circumstances, NSP could be required to reapply RIT in whole or in part.

Is stakeholder engagement adequate?

Cost estimates for large projects are complex and supporting market modelling is highly technical. Current requirements around consumer engagement are not in line with equivalent processes for revenue resets despite quantum of money being similar or even greater.

Consultation requirement for Actionable ISP project RITs involves only 6 weeks consultation on the PADR, plus the ability to raise a dispute post RIT completion.

A key theme that emerged when the AER was developing its CBA guidelines was that, where there is discretion, transparency is also required.

To extent that NSPs retain discretion re how they estimate costs and model benefits, adequate transparency and stakeholder engagement will be needed to provide an appropriate counterweight.

Constructive engagement – e.g. through use of consumer panels – and greater transparency will help build trust, address social licence concerns.

Next steps

- Slides will be published on AEMC project page (later this week)
- Report of roundtable will be published on AEMC project page (late February)
- Draft determination to be released in April 2022 alongside draft report for Stage 2 of Transmission Planning and Investment Review ("Initial changes" report)
- Final determination would then be due for publication in August 2022 (if no extension required)

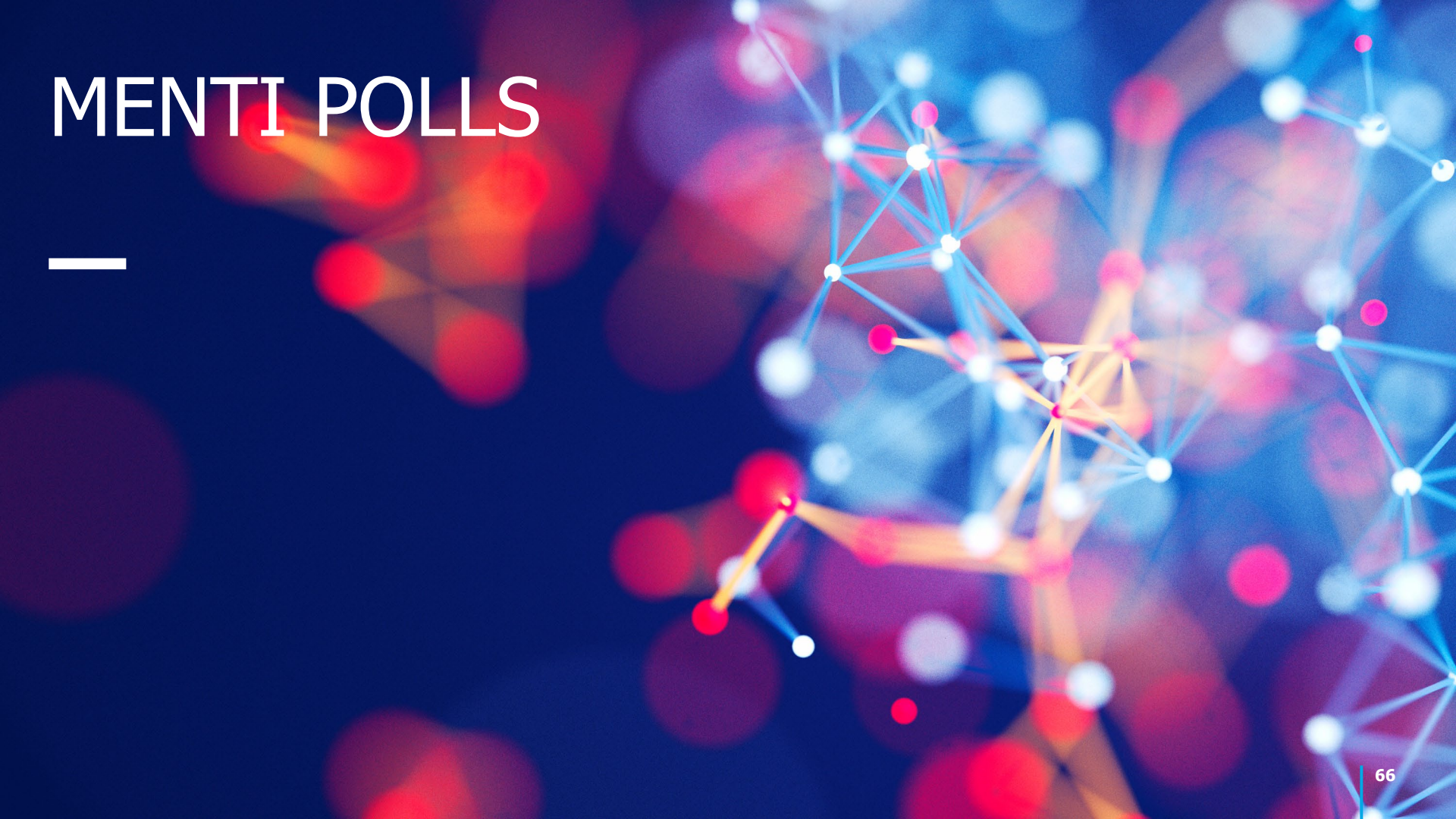
Q&A

- Any points of clarification before we open up for more substantive questions?
- To participate in polls, go to **www.menti.com** and enter code **71 91 71 9** or scan QR code

Thank you for participating!

Please contact us if you have further questions or comments – katy.brady@aemc.gov.au

MENTI POLLS



Interactive poll questions (included in this form to enable pre-reading)

1. To allow us to use anonymised poll data, do you represent
    (a) A network service provider
    (b) Consumers
    (c) Government
    (d) Consultant
    (e) Other

2. Do you think the regulatory framework should prioritise
    (a) Doing RIT analysis well once and anticipating uncertainty through sensitivity testing etc
    (b) Requiring reapplication of the RIT where costs increase/circumstances materially change post-RIT
    (c) Some mix of the two (e.g. retain RIT reapplication requirement but use only in exceptional cases)

3. Do you think cost estimate accuracy should be improved through
    (a) Incentives (e.g. requiring NSPs to reapply RIT if costs increase beyond a specified threshold)
    (b) Prescription (e.g. requiring NSPs to ensure cost benefit analysis includes all key cost inputs, allowance for contingencies etc)
    (c) Some mix of the two (e.g. require certain level of cost estimate accuracy, and use RIT reapplication requirement as a last resort/safety net)

Poll questions cont.

4. Should we focus on increased cost as a key metric, or would a decision rule approach be preferable?

   (a) focus on cost increase only (clear, easily measured)

   (b) use decision rule approach (recognises that changes to costs and benefits, including for other credible options, can change option ranking)

   (c) consider a mix of the two (e.g. require proponents to develop decision rules in RIT, and include cost increase threshold as a safety net to trigger a “RIT currency check” before CPA is submitted)

5. Should there be greater clarity re cost estimate accuracy across the regulatory framework (ISP, RIT, CPA etc)?

   Agree or disagree (slide function)

   Should requirements for cost estimate accuracy reference AACE class estimates?

   Agree or disagree (slide function)

6. If you support the use of AACE estimates, what class of estimate do you think should be used in the ISP, RIT, CPA etc? (open question)

Poll questions cont.

7. If cost increases are used to trigger RIT reapplication (routine, not safety net), what threshold would be appropriate?

Slide function to indicate value

If cost increases are used as a “safety net” RIT currency check trigger (not routine), what threshold would be appropriate?

Slide function to indicate value

8. Given that land related costs have strong potential to increase project costs, what level of detail re line routes should be required at RIT stage?

(a) Preliminary corridor

(b) High level route

(c) Detailed route

9. What projects should be subject to any strengthened requirements?

(a) All RITs

(b) All contingent projects + ISP projects

(c) Contingent projects above a certain value + ISP projects

(d) ISP projects only

If you answered (c), what value projects should be subject to these new requirements (e.g. >$100m)? (open question)

Poll questions cont.

10. Is current stakeholder engagement during the RIT adequate?

    Agree or disagree (slide function)

11. If engagement during the RIT is not adequate, how should stakeholder engagement be strengthened? (open question)

12. Who should be responsible for determining whether there has been a material change in circumstances (that changes ranking of options in RIT)?

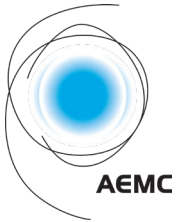
    (a) NSP

    (b) AER

    (c) Other

    If you answered other, then what would you propose? (open question)

13. What other issues need to be considered? (open question)



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