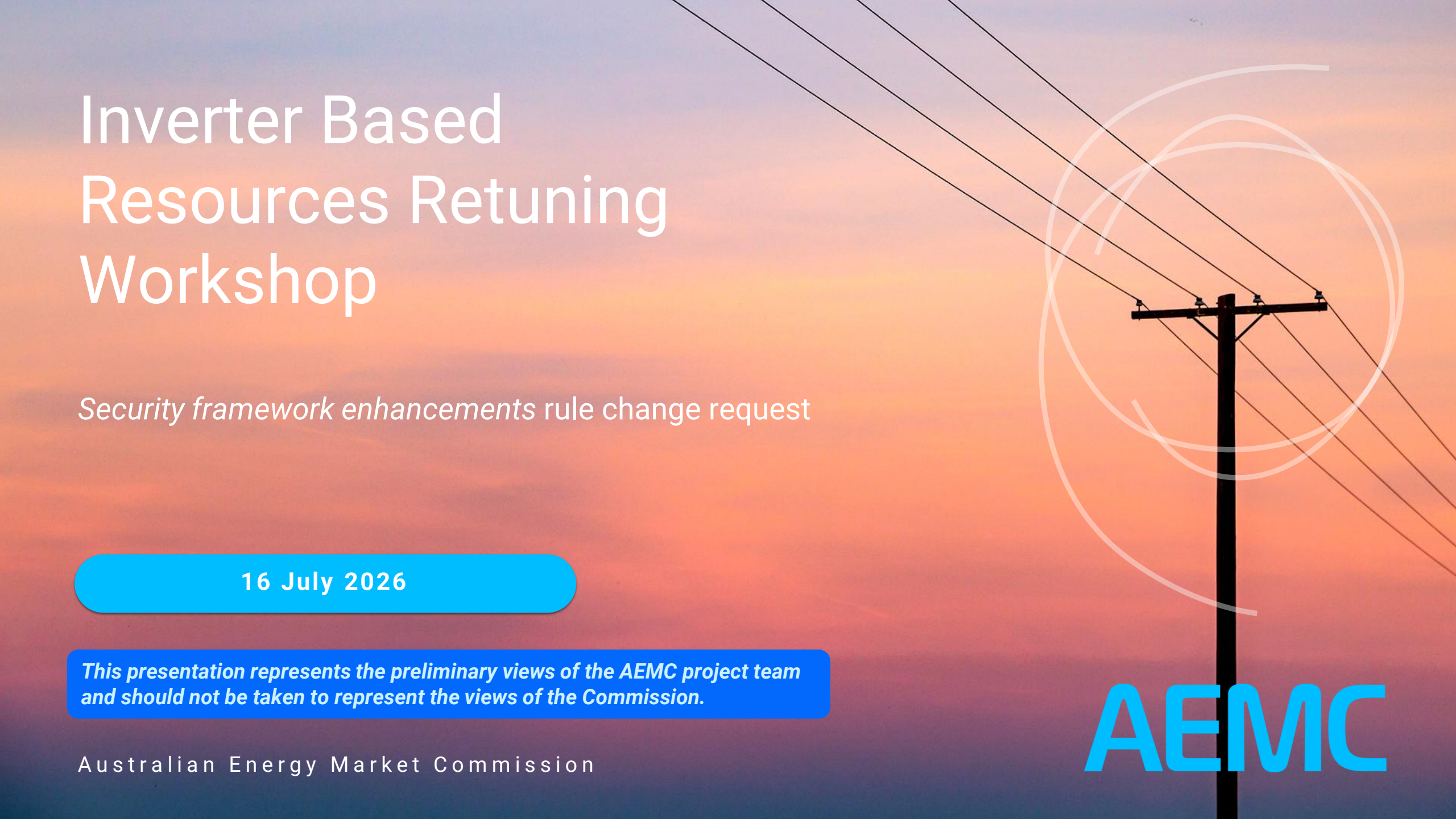
Inverter Based Resources Retuning Workshop

Security framework enhancements rule change request

16 July 2026

This presentation represents the preliminary views of the AEMC project team and should not be taken to represent the views of the Commission.

Australian Energy Market Commission



The AEMC acknowledges and shows respect for the Traditional Custodians of the many different lands across Australia on which we live and work. The AEMC office is located on the land of the Gadigal people of the Eora Nation. We pay respect to all Elders past and present, and the enduring connection of Aboriginal and Torres Strait Islander peoples to Country.

ACKNOWLEDGEMENT OF COUNTRY

Agenda

1	Opening and welcome	Emily Banks	5
2	Context and assessment criteria	Emily Freeman Emily Banks	15 min
3	Scenario discussion	Emily Banks Julius Susanto	90 mins
4	Wrap up and next steps	Emily Banks	10 mins

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By participating in this workshop, you give your consent to our collection, use and disclosure of the personal information you provide to us during this workshop (like your name) for the purpose of completing our consultation and publishing our draft and final determinations and reports on this rule change or review.

This may include publishing a recording or transcript of the workshop, including your questions or comments. We will not publish any participant questions or comments that we consider inappropriate, including offensive or defamatory language.

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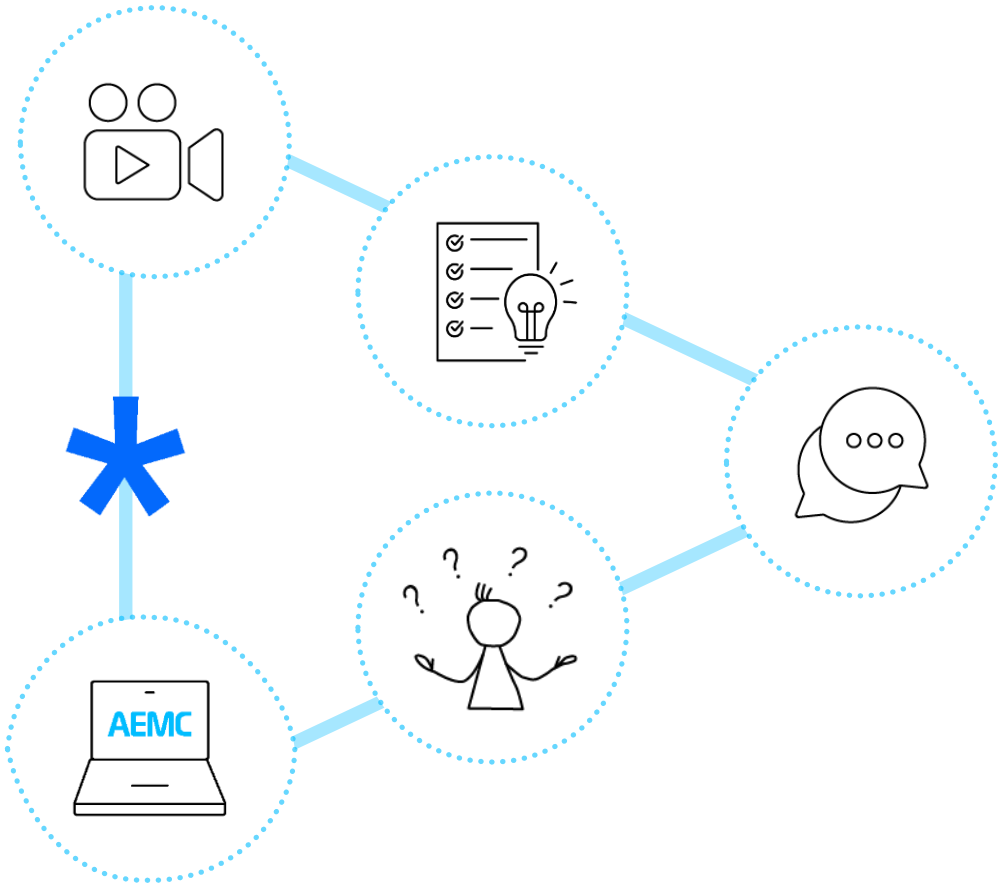
We may publish a transcript or recording of this workshop, which may include your questions or comments



COMPETITION PROTOCOL

KEY PRINCIPLES

The AEMC is committed to complying with all applicable laws, including the ***Competition and Consumer Act 2010*** (CCA), during this forum. Breaching the CCA can lead to serious penalties for individuals involved in any breach (including large financial penalties and imprisonment for key individuals involved). This protocol governs the way in which discussions will proceed at this forum, and each attendee agrees to adhere to this protocol in order to comply with the CCA.

Each attendee must make an independent and unilateral decision about their commercial positions and approach in relation to the matters under discussion in this forum.

Attendees must not discuss, or reach or give effect to any agreement or understanding which relates to:

- pricing for the products and/or services that any attendee supplies or will supply, or the terms on which those products and/or services will be supplied (including discounts, rebates, price methodologies etc)
- targeting (or not targeting) customers of a particular kind, or in particular areas
- tender processes and whether (or how) they will participate
- any decision by attendees:
  - about the purchase or supply of any products or services that other attendees also buy or sell
  - to not engage with persons or the terms upon which they will engage with such persons (i.e. boycotting); or
  - to deny any person's access to any products, services or inputs they require
- sharing competitively sensitive information such as non-publicly available pricing or strategic information including details of customers, suppliers (or the terms on which they do business), volumes, future capacity etc
- breaching confidentiality obligations that each attendee owes to third parties.

COMPETITION PROTOCOL

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Attendees must ensure that all communications (including emails and verbal discussions) adhere to the ***Key Principles***.

This forum will be conducted in accordance with the following rules:

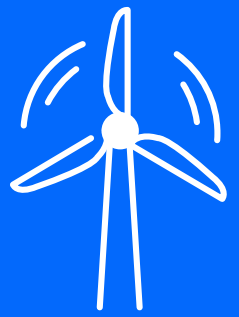
- The agenda for this forum does not include anything that could contravene the Key Principles set out in this protocol.
- We will read and minute the below *competition health warning*:
  - Attendees at this forum must not enter into any discussion, activity or conduct that may infringe, on their part or on the part of other attendees, any applicable competition laws. For example, attendees must not discuss, communicate or exchange any commercially sensitive information, including information relating to prices, marketing and advertising strategy, costs and revenues, terms and conditions with third parties, terms of supply or access.
  - Participating in this forum is subject to you having read and understood the protocol including the Key Principles.
- We will keep accurate minutes of the forum, including details of attendees.
- If something comes up during the forum that could risk contravening any competition laws, attendees should:
  - Object immediately and ask for the discussion to be stopped.
  - Ensure the minutes record that the discussion was objected to and stopped.
  - Raise concerns about anything that occurred in the forum with their respective legal counsel immediately afterwards.
- All attendees understand that any competitively sensitive matters must be subject to legal review before any commitment/agreement can be given.
- Any decision about whether, and on what terms, to engage with customers and suppliers is an independent and unilateral decision of each attendee.

Context and assessment criteria

Context

The AEMC is currently considering two rule change requests (now consolidated):

- Security framework enhancements (AEMO), submitted in November 2025
- Clarity and transparency of security frameworks (AEC/CEC), submitted in January 2026.



The rule change requests raise a range of issues and proposed solutions to address these issues.

Today's session will focus on the topic of **inverter-based resource (IBR) retuning for connected and operating plant.**

Our aim is to discuss and get input on this topic from industry. We will:

1. establish the role that retuning could play in supporting system security outcomes
2. discuss key scenarios where retuning may be of benefit to the system, and the regulatory, commercial and technical barriers to retuning in these scenarios.

Your feedback will inform our approach to the Draft Determination, due to be published by **15 October 2026**.

The case for enhancing the ability to retune

What we've heard from stakeholders

In submissions to the consultation paper, both AEMO and Transgrid raised IBR retuning as a potential option for more cost-efficient management of system strength issues.

What we understand about retuning

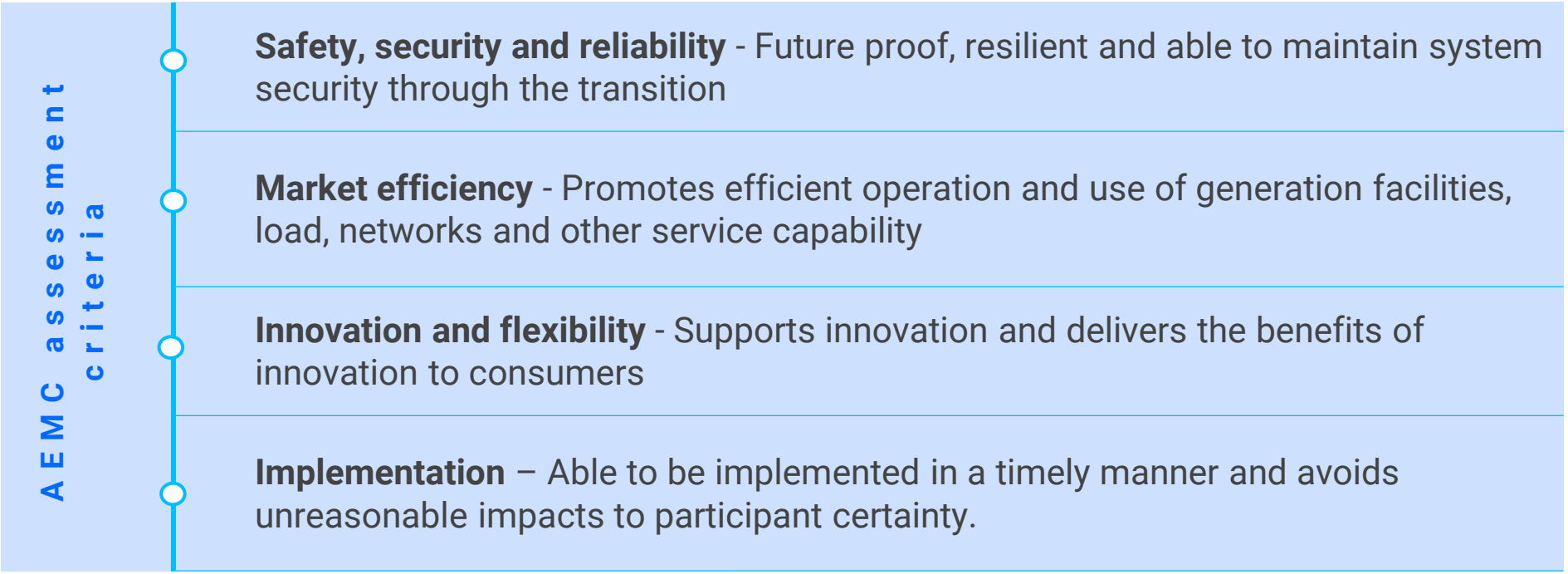
- There are a range of scenarios where retuning could benefit the system.
  - Declining fault levels and increasing concentrations of IBR means system strength issues occur more frequently and are more complex to manage.
  - IBR control settings determined at commissioning can become sub-optimal, or even destabilising.
- Retuning may be a more cost-efficient option to manage system strength issues (related to stable voltage waveforms), compared with alternatives such as dispatch constraints, building network assets or contracting with non-network solutions.

Our assessment of the problem

1. There are currently limited incentives and potentially significant drawbacks for IBR to retune in many of these scenarios.
2. TNSPs have limited ability to 'require' retuning, and there are scenarios where it may not be appropriate to do.

What we consider success looks like

Reforms through the AEMC's process are progressed based on these NEO criteria…

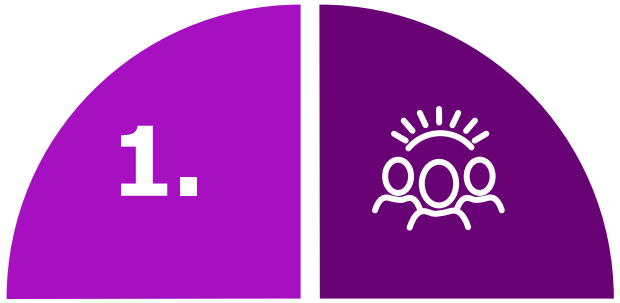


… so this means any reforms related to retuning will focus on:

1. **Efficient management of system strength**
2. **Clear and predictable expectations for participants**

Reforms to encourage retuning should consider these elements

Roles and responsibilities

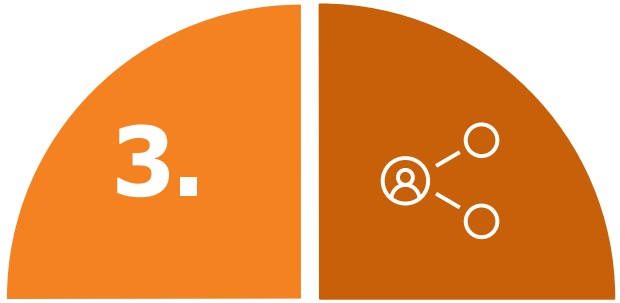


Initiation
Modelling
Decision maker/oversight

Voluntary or mandatory
Timing and cadence
Allowed scenarios

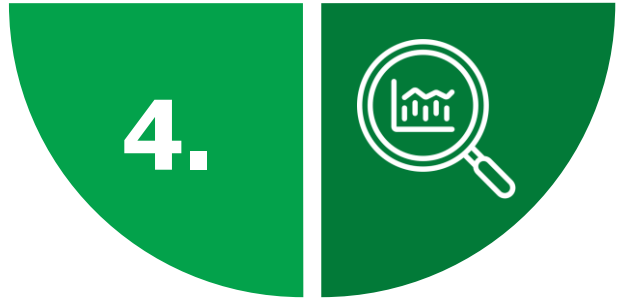
Guardrails and flexibility

Cost and risk management



Who pays?
Compensation

Interactions with S5.3.9



Compliance

Discussion: Are there any key or sub-elements missing?

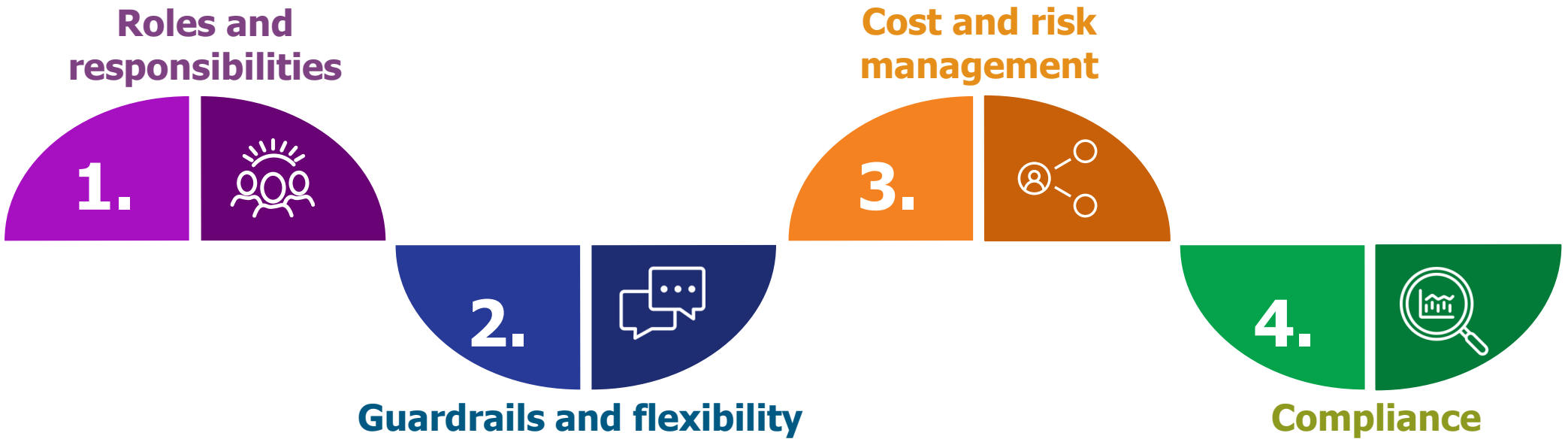
Scenario discussion

Today's discussion

We will discuss four scenarios where the incentives for different parties to engage in retuning differ:

1. Retuning of existing IBR due to progressive grid changes
2. Retuning to allow new entrant IBR connection
3. SSSP-initiated retuning for stable voltage waveform
4. Retuning of legacy IBR plant.

We have constructed these scenarios to prompt discussion and will invite views on each of the key elements.

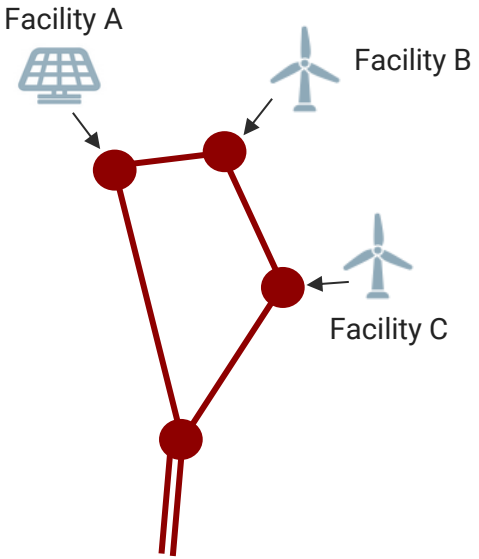


Scenario 1: Retuning of existing IBR due to progressive grid changes

Scenario description

- Facilities A, B and C are existing IBR facilities that experience progressive changes to the network (e.g. thermal generator retirements) such that over time, the grid has evolved significantly from the time of connection.
- The SCRs observed by existing facilities A, B and C progressively decrease over time. By 2030, all facilities have SCR < 3.
- System strength issues may materialise based on the original IBR parameter settings that were tuned for different grid conditions.
- Constraints may be applied to the IBR facilities to manage system strength issues in operational timeframes.
- Retuning all three facilities may be part of the efficient suite of options for managing system strength issues in this area.

Hypothetical example of how the grid can evolve over time



Facility	Short Circuit Ratio (SCR)					
	2020	2022	2024	2026	2028	2030
A	10.1	9.9	6.6	5.2	3.1	2.6
B	9.3	8.8	5.4	4.3	2.9	2.4
C	-	-	5.7	4.6	3.4	2.8

Scenario 1: Retuning of existing IBR due to progressive grid changes

Incentives aligned for all participants

- Incentives are aligned for AEMO, TNSP, IBR facilities and consumers as they all stand to benefit from retuning (i.e. relaxing of constraints leading to lower curtailment), provided the cost of retuning does not outweigh benefits from reduced curtailment.

Example questions for discussion:

Roles

Who should initiate and coordinate the retuning process?
Who should the decide whether retuning should occur and the revised parameter settings?

Guardrails

Should participation be optional?
How often should/could this retuning occur?

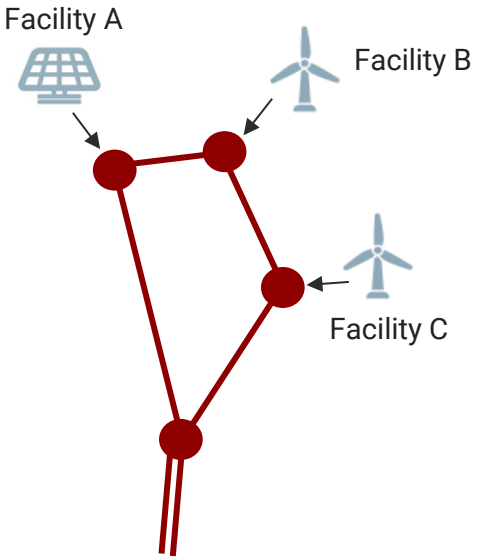
Costs/risks

How much effort/resourcing is reasonable for each participant to put towards investigating and testing solutions? Is this proportionate to the benefits?
Who pays and how could these costs be recovered?

Compliance

Should this require re-opening of the 5.3.9 process?
Are there any other compliance concerns?

Hypothetical example of how the grid can evolve over time



Facility	Short Circuit Ratio (SCR)					
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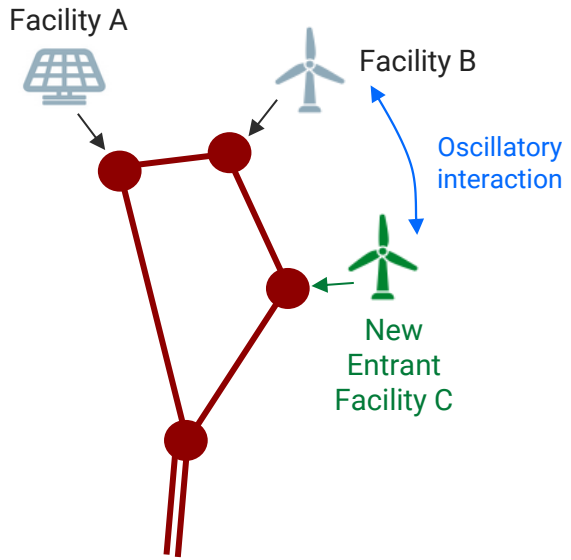
B	9.3	8.8	5.4	4.3	2.9	2.4
C	-	-	5.7	4.6	3.4	2.8

Scenario 2: Retuning to allow new entrant IBR connection

Scenario description

- Facilities A and B are existing IBR facilities.
- New entrant facility C wants to connect, but during the connection process, simulation studies (as part of the wide-area stability assessment) identify an oscillatory interaction with facility B.
- Facility B is old and tuned for a high SCR that was appropriate at the time of connection. However, the SCR has gradually reduced over the years.
- Retuning facility B, in conjunction with facility C, would be the most efficient means for addressing the problem.
- It may also be desirable to retune facility A to provide more damping of potential oscillatory control modes.



Facility	Short Circuit Ratio (SCR)					
	2020	2022	2024	2026	2028	2030
A	10.1	9.9	6.6	5.2	3.1	2.6
B	9.3	8.8	5.4	4.3	2.9	2.4
C	-	-	-	-	3.3	2.8

Scenario 2: Retuning to allow new entrant IBR connection

Incentives not aligned for all participants

- Neither facility A nor B have any incentive to retune, as they are not the beneficiaries of retuning and a new entrant could lead to increased congestion.

Example questions for discussion:

Roles

Who should initiate and coordinate the retuning process?
Who should the decide whether retuning should occur and the revised parameter settings?

Guardrails

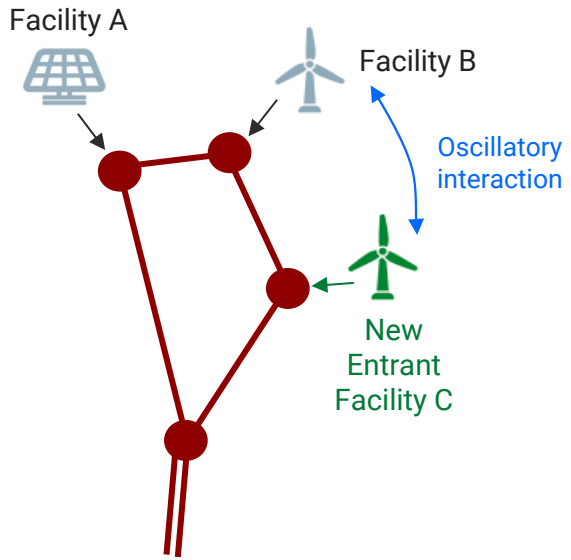
Should participation be optional?
How often should/could this retuning occur?

Costs/risks

How much effort/resourcing is reasonable for each participant to put towards investigating and testing solutions? Is this proportionate to the benefits?
Who pays and how could these costs be recovered?

Compliance

Should this require re-opening of the 5.3.9 process?
Are there any other compliance concerns?



Facility	Short Circuit Ratio (SCR)					
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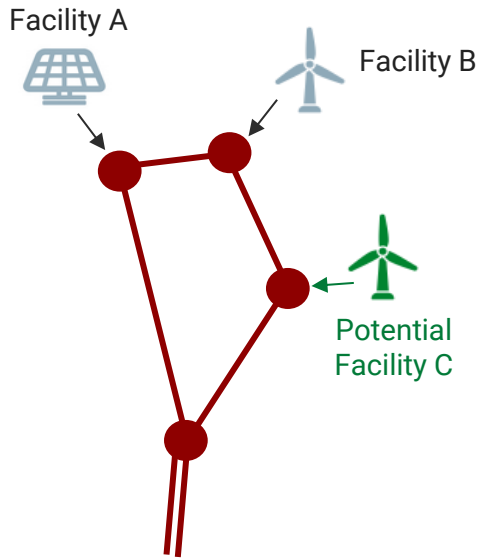
A	10.1	9.9	6.6	5.2	3.1	2.6
B	9.3	8.8	5.4	4.3	2.9	2.4
C	-	-	-	-	3.3	2.8

Scenario 3: SSSP-initiated retuning for stable voltage waveform

Scenario description

- Facilities A and B are existing IBR facilities.
- Facility C is a potential new entrant facility representing the new IBR capacity that AEMO has forecast for the efficient level.
- The SSSP identifies that retuning existing facilities A and B is the most efficient option (or part of an efficient suite of measures which may also include contracting a grid-forming BESS) for achieving the stable voltage waveform criteria.



Facility	Short Circuit Ratio (SCR)					
	2020	2022	2024	2026	2028	2030
A	10.1	9.9	6.6	5.2	3.1	2.6
B	9.3	8.8	5.4	4.3	2.9	2.4
C	-	-	5.7	4.6	3.4	2.8

Scenario 3: SSSP-initiated retuning for stable voltage waveform

Incentives not aligned for all participants

- Neither facility A or B have any incentive to retune.
- The SSSP must comply with system strength criteria.

Example questions for discussion:

Roles

Who should initiate and coordinate the retuning process?
Who should the decide whether retuning should occur and the revised parameter settings?

Guardrails

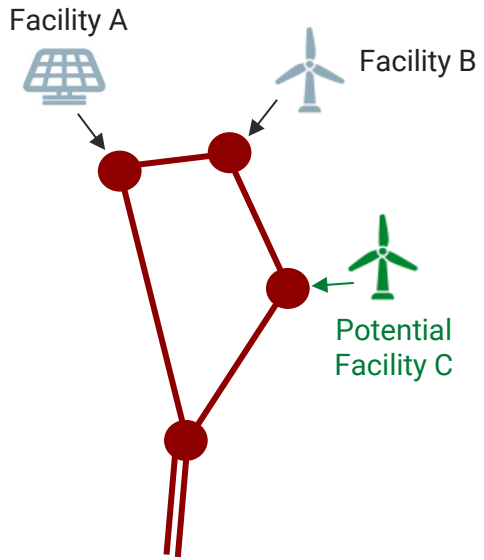
Should participation be optional?
How often should/could this retuning occur?

Costs/risks

How much effort/resourcing is reasonable for each participant to put towards investigating and testing solutions? Is this proportionate to the benefits?
Who pays and how could these costs be recovered?

Compliance

Should this require re-opening of the 5.3.9 process?
Are there any other compliance concerns?



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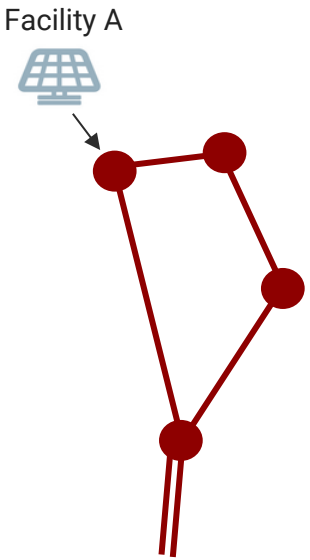
A	10.1	9.9	6.6	5.2	3.1	2.6
B	9.3	8.8	5.4	4.3	2.9	2.4
C	-	-	5.7	4.6	3.4	2.8

Scenario 4: Retuning of legacy IBR plant

Scenario description

- Facility A is an existing IBR facility.
- At the time of connection, the facility was tuned at a high SCR but over time, the SCR has decreased and the facility is observed to be poorly tuned for a lower SCR (e.g. poorly damped voltage oscillations after events, etc).
- Retuning is identified to be the most efficient way to address the issue. However, the plant is old and does not have an accurate EMT model. The OEM has also gone out of business.
- Facility A may be subject to operational constraints.



Facility	Short Circuit Ratio (SCR)					
	2020	2022	2024	2026	2028	2030
A	10.1	9.9	6.6	5.2	3.1	2.6

Scenario 4: Retuning of legacy IBR plant

Incentives aligned for all participants

- The Market Participant for facility A would need to get an EMT model developed before retuning. Depending on the impact of constraints, the whole exercise may not be worth it for them.

Example questions for discussion:

Roles

Who should initiate and coordinate the retuning process?
Who should the decide whether retuning should occur and the revised parameter settings?

Guardrails

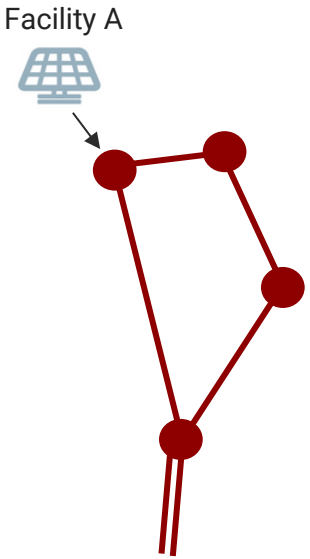
Should participation be optional?
How often should/could this retuning occur?

Costs/risks

How much effort/resourcing is reasonable for each participant to put towards investigating and testing solutions? Is this proportionate to the benefits?
Who pays and how could these costs be recovered?

Compliance

Should this require re-opening of the 5.3.9 process?
Are there any other compliance concerns?



Facility	Short Circuit Ratio (SCR)					
	2020	2022	2024	2026	2028	2030
A	10.1	9.9	6.6	5.2	3.1	2.6

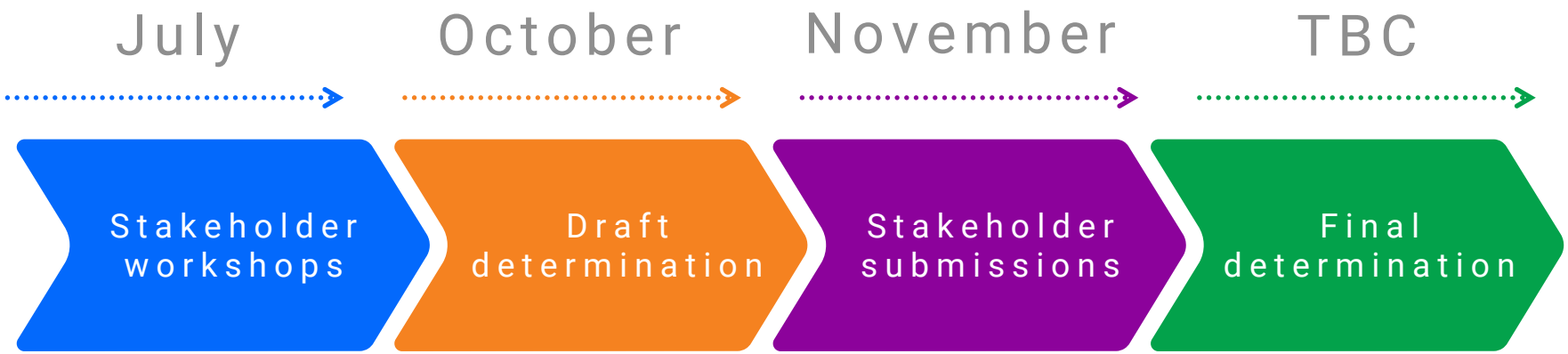
Final discussion: Key considerations across all scenarios

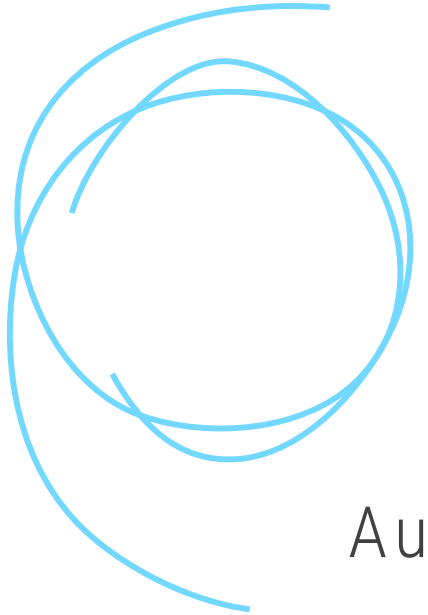
What retuning elements were common amongst scenarios?

Scenario 1	Scenario 2	Scenario 3	Scenario 4
Retuning of existing IBR due to progressive grid changes	Retuning to allow new entrant IBR connection	SSSP-initiated retuning for stable voltage waveform	Retuning of legacy IBR plant

Wrap up and key takeaways

Next steps for *Security framework enhancements* rule change request





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