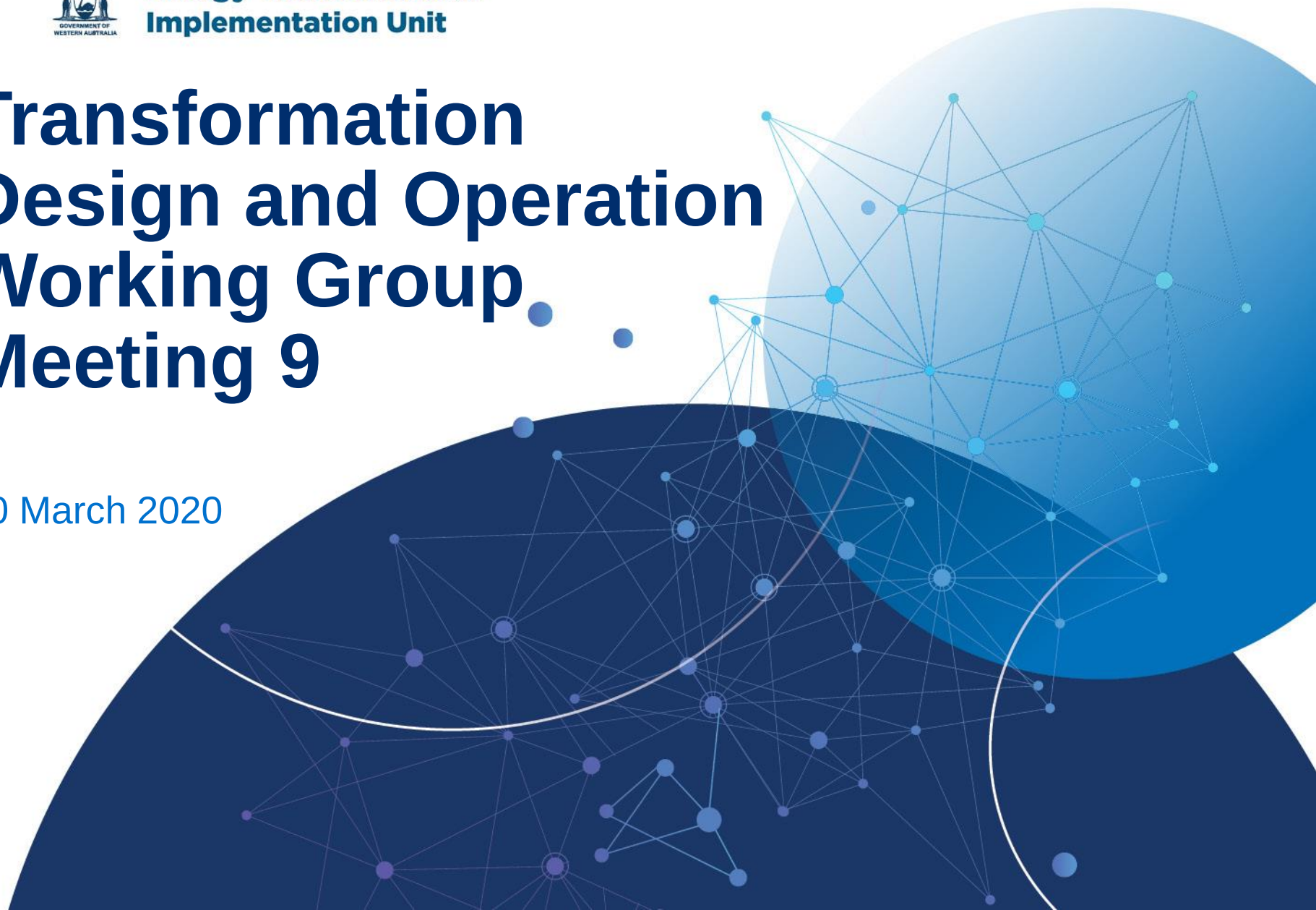
Energy Transformation Implementation Unit

Transformation Design and Operation Working Group Meeting 9

10 March 2020



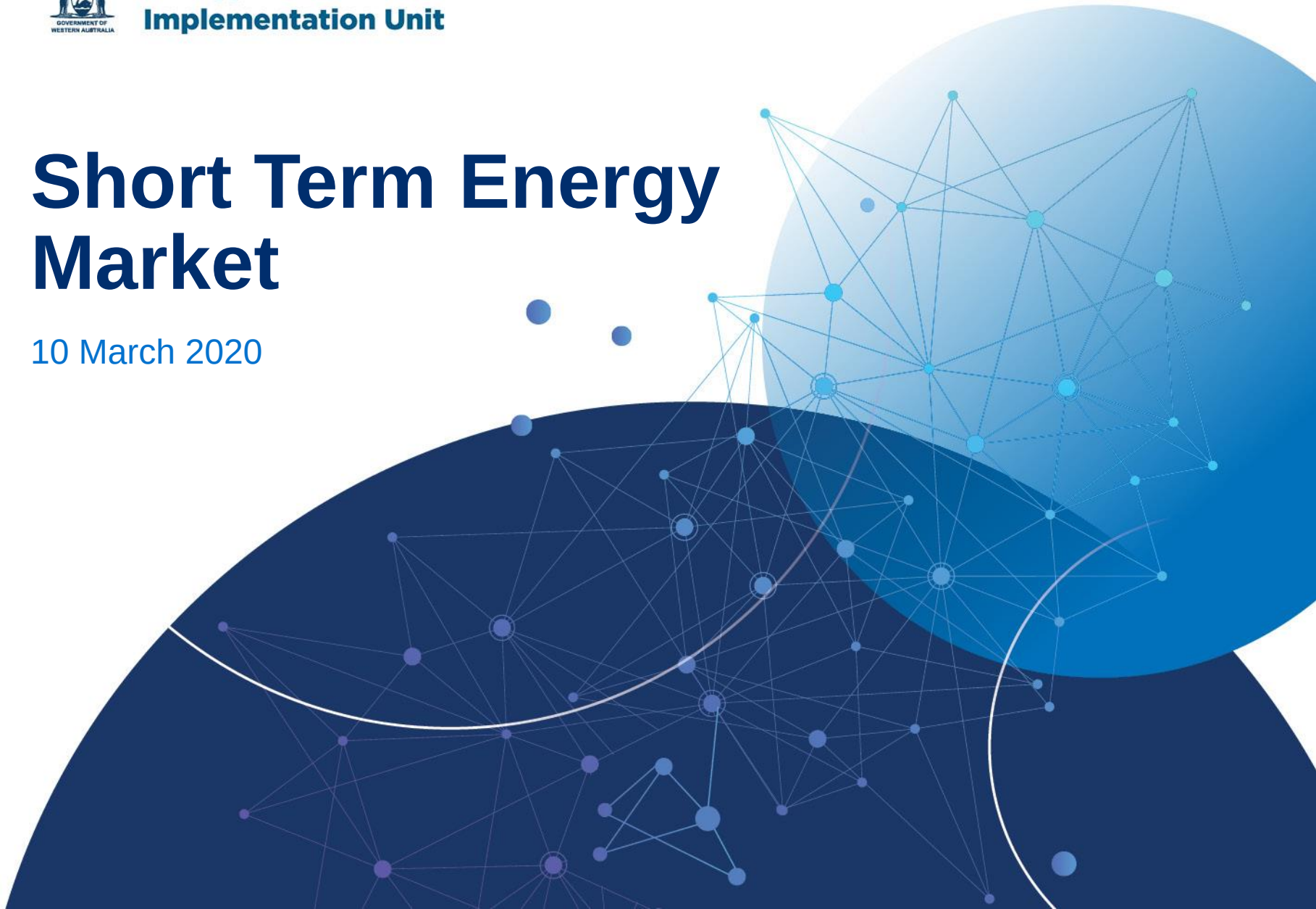
Ground Rules

- The Chair will aim to keep the meeting on time so that we can get through the large volume of material for discussion.
- Questions and issues raised must be kept relevant to the discussion. Other matters can be raised at the end of the meeting or via email to TDOWG@energy.wa.gov.au
- Please state your name and organisations when you ask a question to assist with meeting minutes.
- This meeting will be recorded for minute taking.

Energy Transformation Implementation Unit

Short Term Energy Market

10 March 2020



Contents

Recap – current and future state of STEM

A binding day-ahead market provides a further hedge opportunity for participants, and provides a financial basis for commitment decisions for long-start-time facilities.

Current state

- Short-Term Energy Market (STEM) provides a central, transparent venue for short term (day ahead) hedging for independent retailers on a portfolio basis
- Participants holding Capacity Credits obliged to offer that capacity into STEM
- STEM clears on a unconstrained, portfolio basis
- Portfolio provides most ancillary services, & in predictable quantities

Future state

- STEM will be retained on current unconstrained basis
- ESS procured from open market and cooptimised with energy
- Constrained dispatch in real-time introduces risk for long-term contracts and existing STEM
- Pre-dispatch schedule provides better data in advance of STEM

Recap – STEM design changes

Task force approved design approach:

- replace AEMO calculation of Maximum Supply Capability (MSC) with obligation to provide pre-dispatch schedule output
- retain the obligation for participants to offer volumes based on capacity credit holdings, but remove adjustment for projected essential system service quantities and network outages
- relax the requirement to offer at Short Run Marginal Cost (SRMC) to only apply to pre-dispatch energy volumes; and
- align the STEM interval with the settlement interval when moving to 5 minute settlement
- No change to STEM auction window

Minimal change on market customer side.

New STEM timeline – before scheduling day

(D = trading day
= 0800h to 0800h)

D-7 0800 to D-1 0850: Participants submit:

- bilateral submissions
- bilateral standing submissions

D-7 0800 to D-1 1050: Participants submit:

- STEM standing submissions
- STEM submissions

D-7 0200: First week-ahead schedule including D0. Schedule outputs for each interval include:

- system-wide market load forecast as at reference node
- quantity of each Essential System Service (ESS) required
- Known binding network constraints
- offered ‘available’ and ‘in-service’ quantities and forecast dispatch quantities for every facility for energy and each ESS
- total offered ‘available’ and ‘in-service’ offered quantities for energy and each ESS.

D-6 0200: Week Ahead Schedule (WAS) to end of D+1

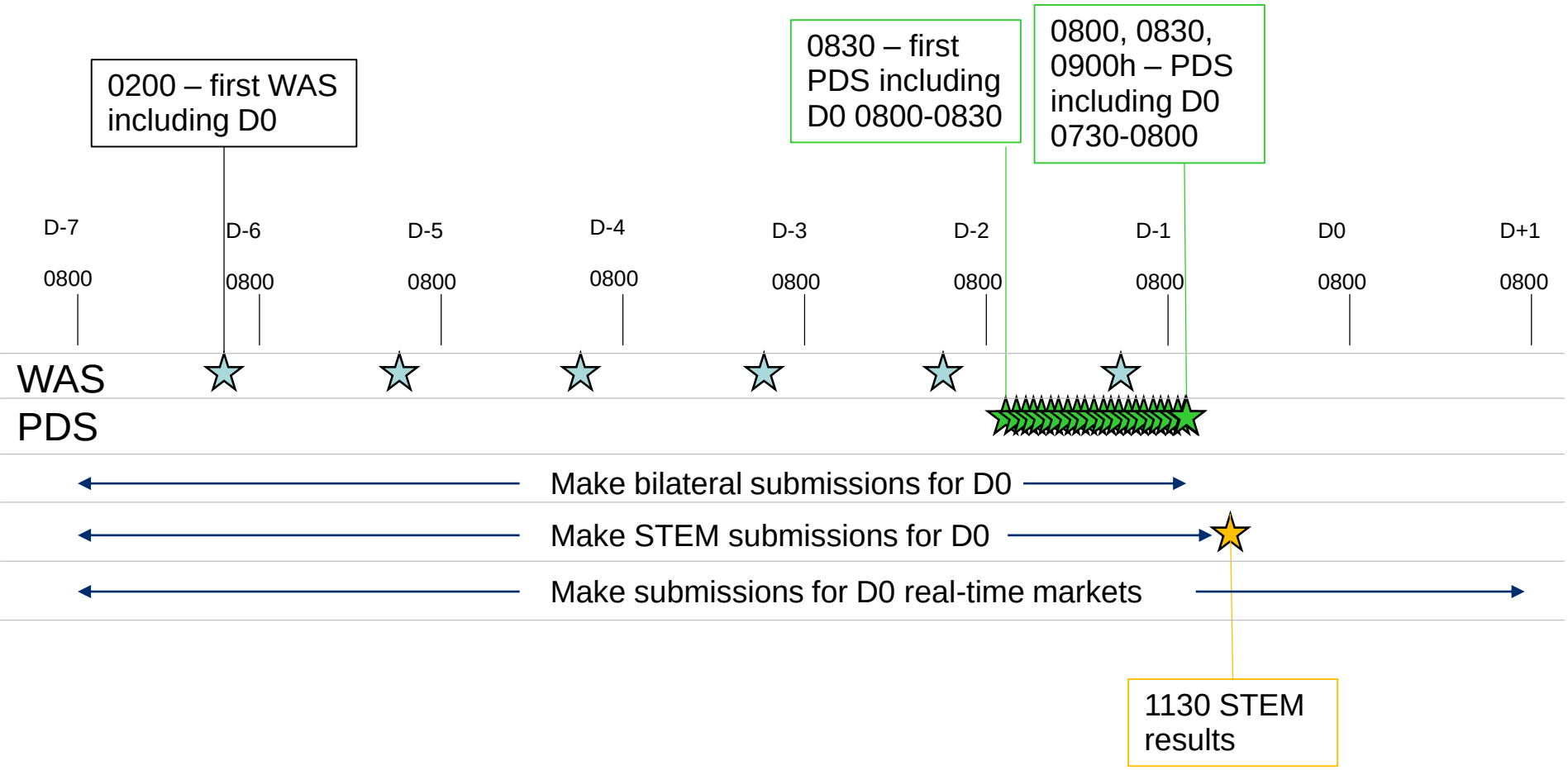
D-5 0200: WAS to end of D+2

D-4 0200: WAS to end of D+3

D-3 0200: WAS to end of D+4

D-2 0200: WAS to end of D+5

STEM timelines – before scheduling day



New STEM timeline – scheduling day

D-1 0800: First pre-dispatch schedule including D0 0730-0800 interval

D-1 0830:

- Second pre-dispatch schedule including D0 0730-0800 interval
- AEMO sends draft bilateral submission quantities for D0 (using 0820 data) to each participant

D-1 0900:

- Third pre-dispatch schedule including D0 0730-0800 interval
- AEMO sends final bilateral submission quantities (using 0850 data) to each participant
- AEMO publishes total bilateral contract data

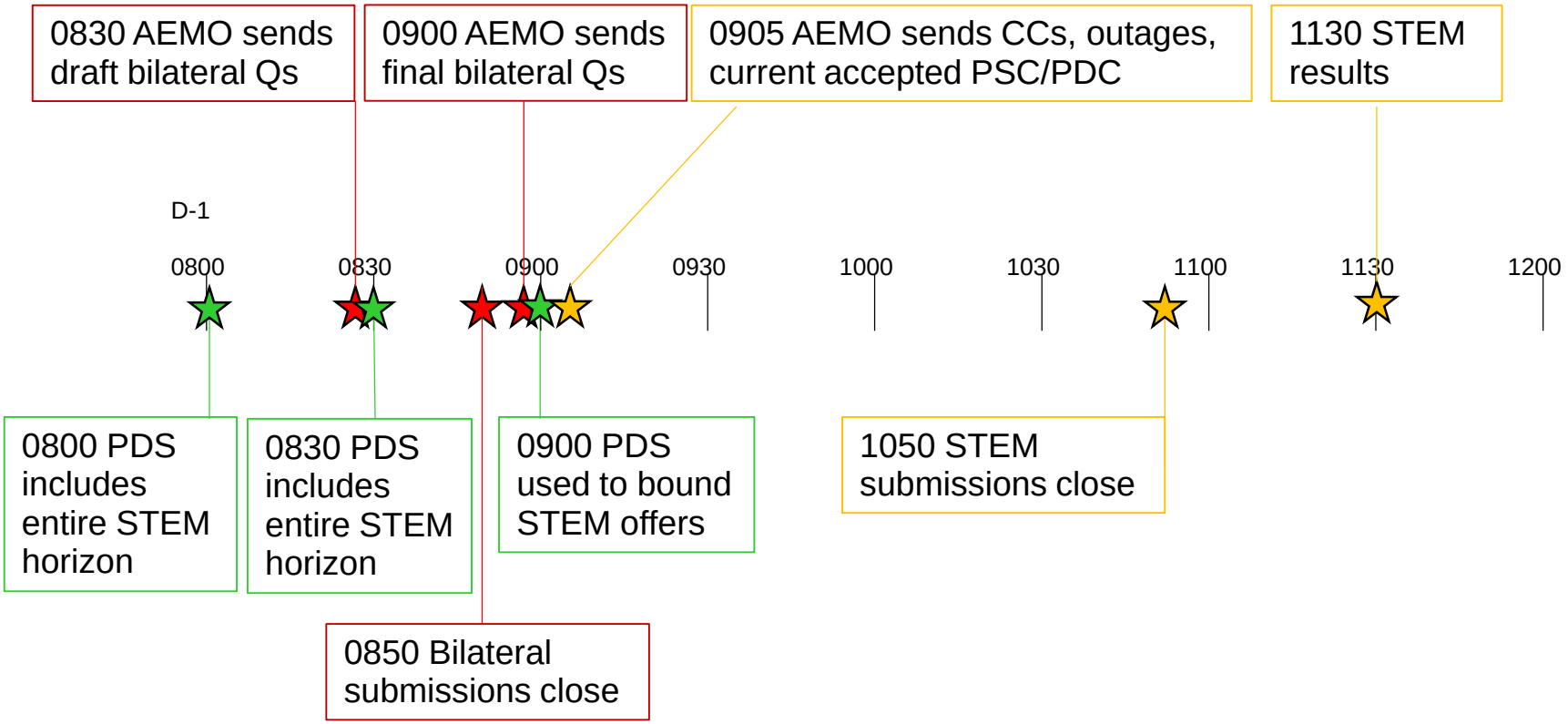
D-1 0905:

- AEMO sends to each participant:
  - total CCs held
  - total planned outage quantities
  - total currently accepted Portfolio Supply Curve & Portfolio Demand Curve quantities
- Where no STEM submissions yet received for D0, AEMO converts standing STEM submissions to draft STEM submissions (based on 0900 data)

D-1 0905 – D-1 1050: Participants finalise STEM submissions based on 0900 PDS.

D-1 1130: AEMO run STEM auction and publish results

STEM timelines – scheduling day



STEM submissions

Current

Fuel declaration*

Availability Declaration

Ancillary Service Declaration

Portfolio Supply Curve

- Quantity capped at MSC less Availability Declaration
- Quantity above Max STEM Price capped at sum of Liquid Facilities less outages, less availability declaration, less AS declaration

Portfolio Demand Curve

- Quantity capped at Maximum Consumption Capability (MCC)

Future

Fuel declaration*

Portfolio Supply Curve

- Quantity capped at sum of quantities offered as ‘in-service’ and ‘available’ into 0900 pre-dispatch
- Quantity above Max STEM Price* capped at sum of ‘in-service’ and ‘available’ quantities for Liquid Facilities offered into 0900 PDS

Portfolio Demand Curve

- Quantity capped at MCC

*Need for Alt Max STEM Price will be considered as part of market power work

STEM offer obligations

Harmonise good faith offer provisions across all markets. Participants must:

- Have reasonable grounds for STEM bids and offers
- make STEM bids and offers in good faith – having a genuine intention to honour the terms of the submission
- not seek to mislead other Participants

Min STEM offer quantity ≈ RCOQ less outage ≈ declared 41° availability (driven by 4.26.2)

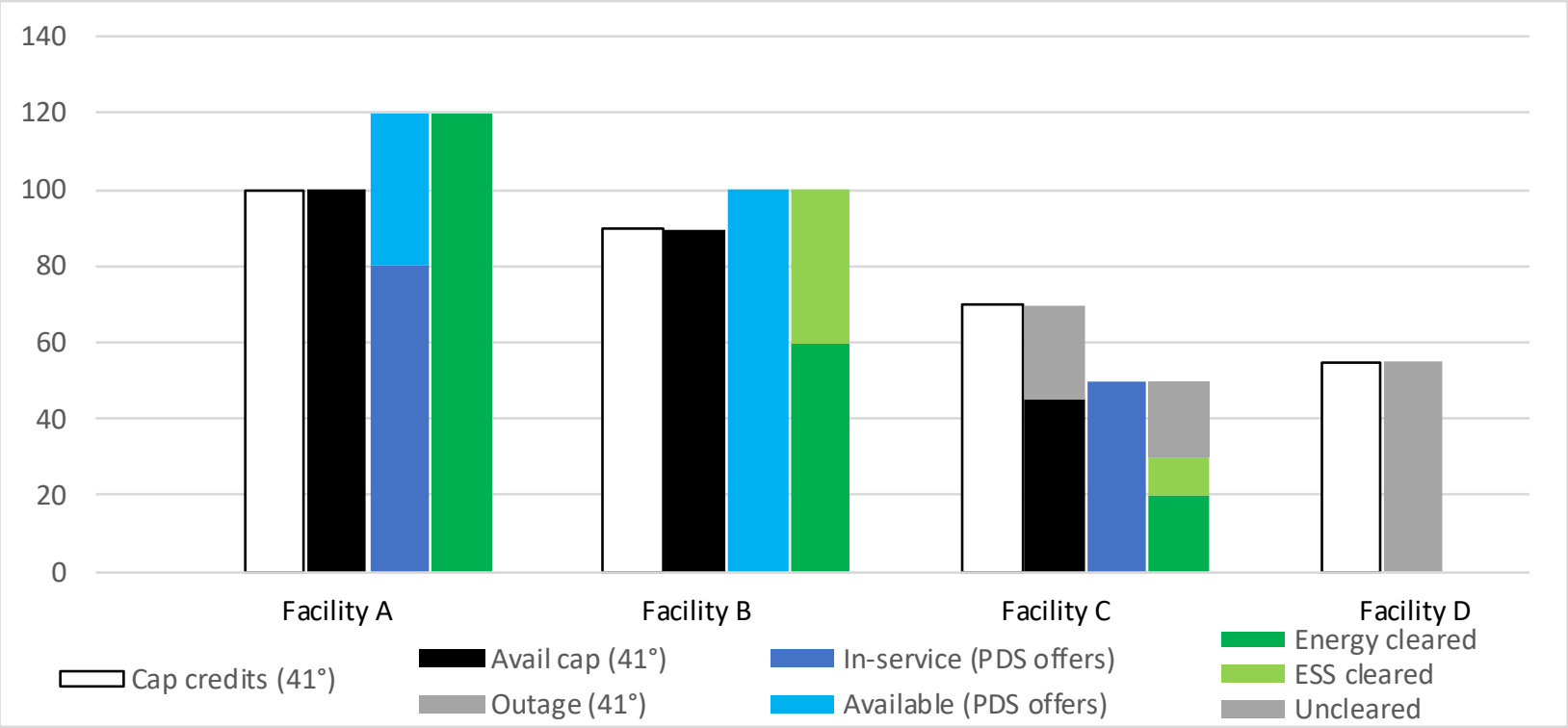
Max STEM offer quantity = pre-dispatch ‘available’ + ‘in-service’ offer

Max STEM bid quantity (remains as now) = sum of max consumption quantities

Market power framework to be further developed, current thinking:

- ERA to consider potential for network constraints when investigating market power exercise
- Offers in supply curve must be *based on* reasonable expectation of cost
- Unreasonable for STEM offer price for PDS cleared energy quantity to include risk premium
- May be reasonable to include risk premium for some portion of offered but uncleared energy quantity, depending on cleared energy and binding constraints in other PDS scenarios (e.g. high load)
- May be reasonable for STEM offer price for PDS cleared ESS quantity to include risk premium

STEM offer obligations - examples



Facility A

- No outage
- Fully offered in PDS (partially 'in-service', partially 'available')
- Pre-dispatch has fully cleared for energy

Facility B

- No outage
- Fully offered in PDS ('available')
- Pre-dispatch has cleared part for energy, part for ESS

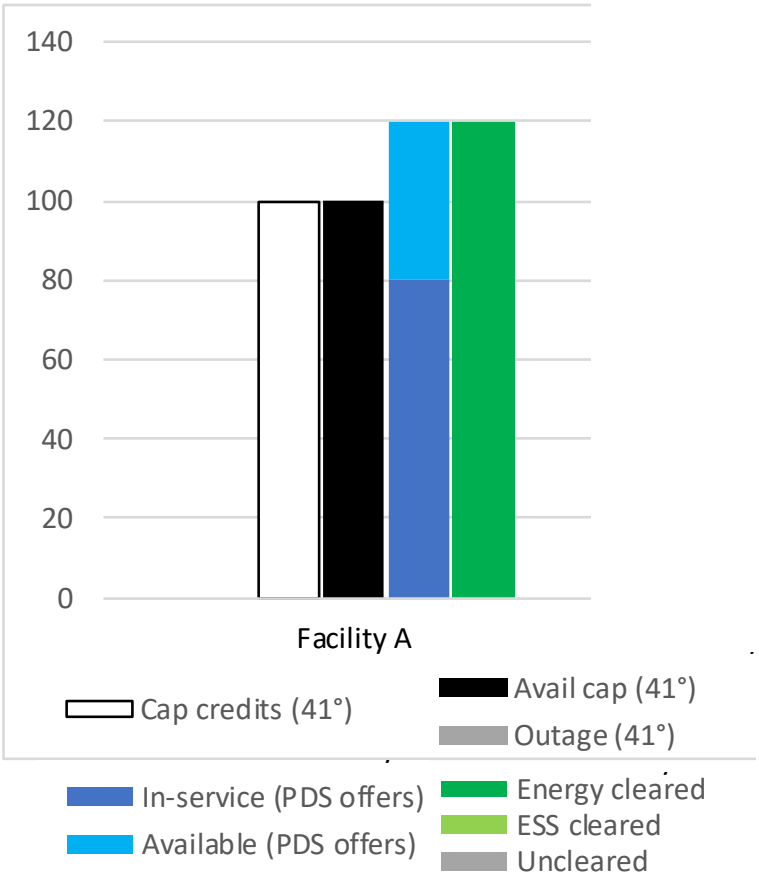
Facility C

- Partial outage declared
- Offered in PDS ('in-service') for available capacity
- Pre-dispatch has cleared part for energy, part for ESS, and left some uncleared

Facility D

- Full outage declared
- Not offered in PDS (no 'available' or 'in-service' capacity)
- Not cleared in predispatch

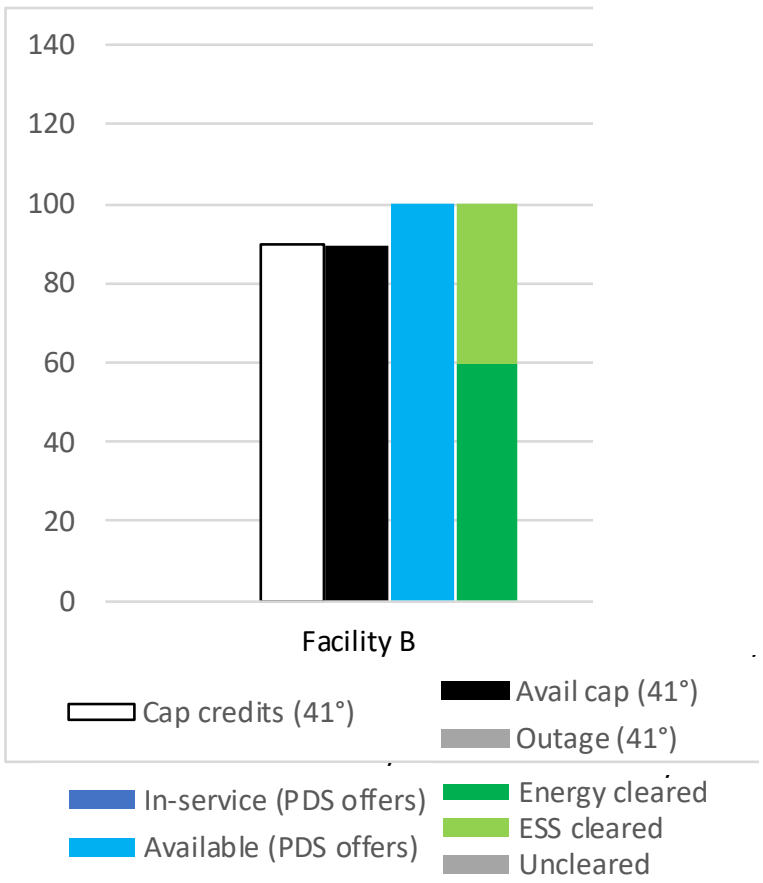
STEM offer obligations - examples



Facility A

- Min STEM offer quantity = 100 (or face refunds)
- Max STEM offer quantity = 120
- Best estimate is that will be fully dispatched for energy
- Possible STEM offer: 120 at SRMC
- Network conditions could change between now and real-time, meaning not cleared for energy – same risk exists today

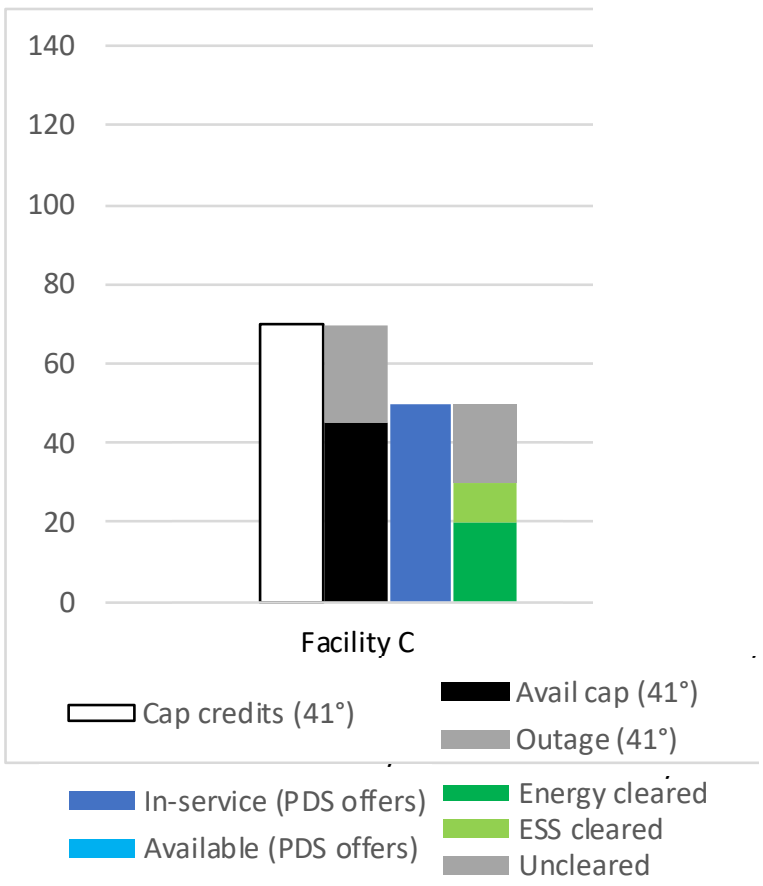
STEM OFFER obligations - examples



Facility B

- Min STEM offer quantity = 90
- Max STEM offer quantity = 100
- Best estimate is that will be partially dispatched for energy, partially for ESS
- Possible STEM offer:
  - 60 at SRMC (PDS cleared energy)
  - 40 at a higher price (PDS cleared ESS)
- If cleared in STEM for > 60, STEM price would be > SRMC
- Participant could be out of pocket if:
  - Due to ESS dispatch, participant STEM energy quantity > Participant real-time energy quantity
  - Real-time energy price > STEM price
  - ESS prices do not cover difference between SRMC and energy price
- If ESS quantities are needed for energy in real-time, that is an ESS shortage, and ESS price would spike.

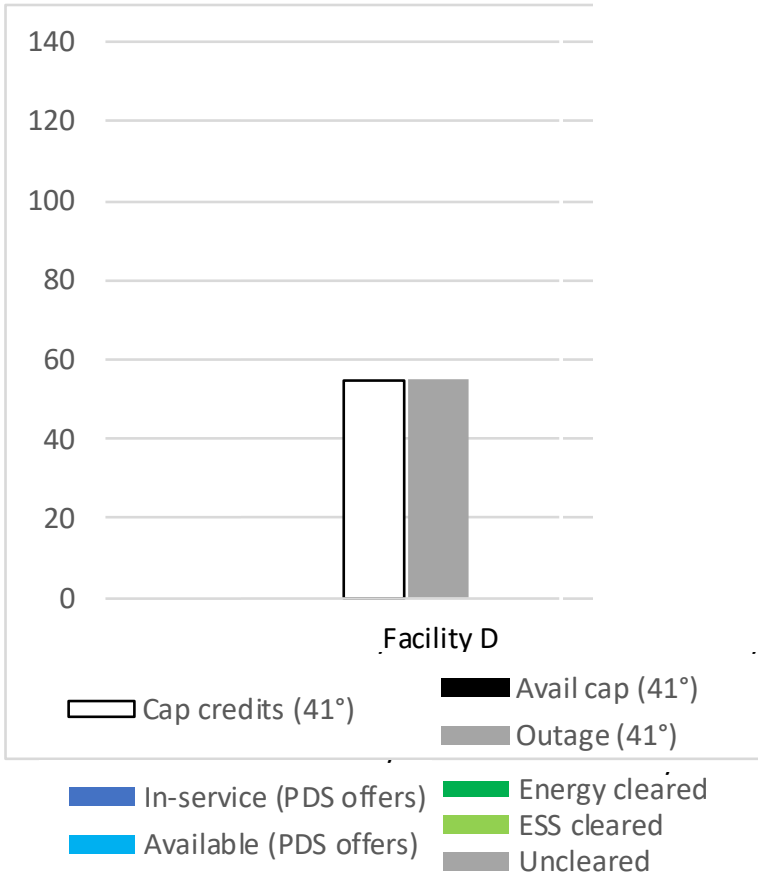
STEM OFFER obligations - examples



Facility C

- Capacity credits/RCOQ = 70
- Outage (@ 41°) = 20
- Min STEM offer quantity = 45
- Max STEM offer quantity = 50
- Best estimate is that will be partially dispatched for energy, partially for ESS, partially not cleared
- Possible STEM offer:
  - 20 at SRMC (PDS cleared energy)
  - 20 at somewhat higher price (PDS uncleared)
  - 10 at an even higher price (PDS cleared ESS)
- Whether SRMC is a reasonable price for PDS uncleared quantity depends on whether other PDS scenarios indicate additional facility would be cleared if load were higher, or if there are binding network constraints in PDS output.

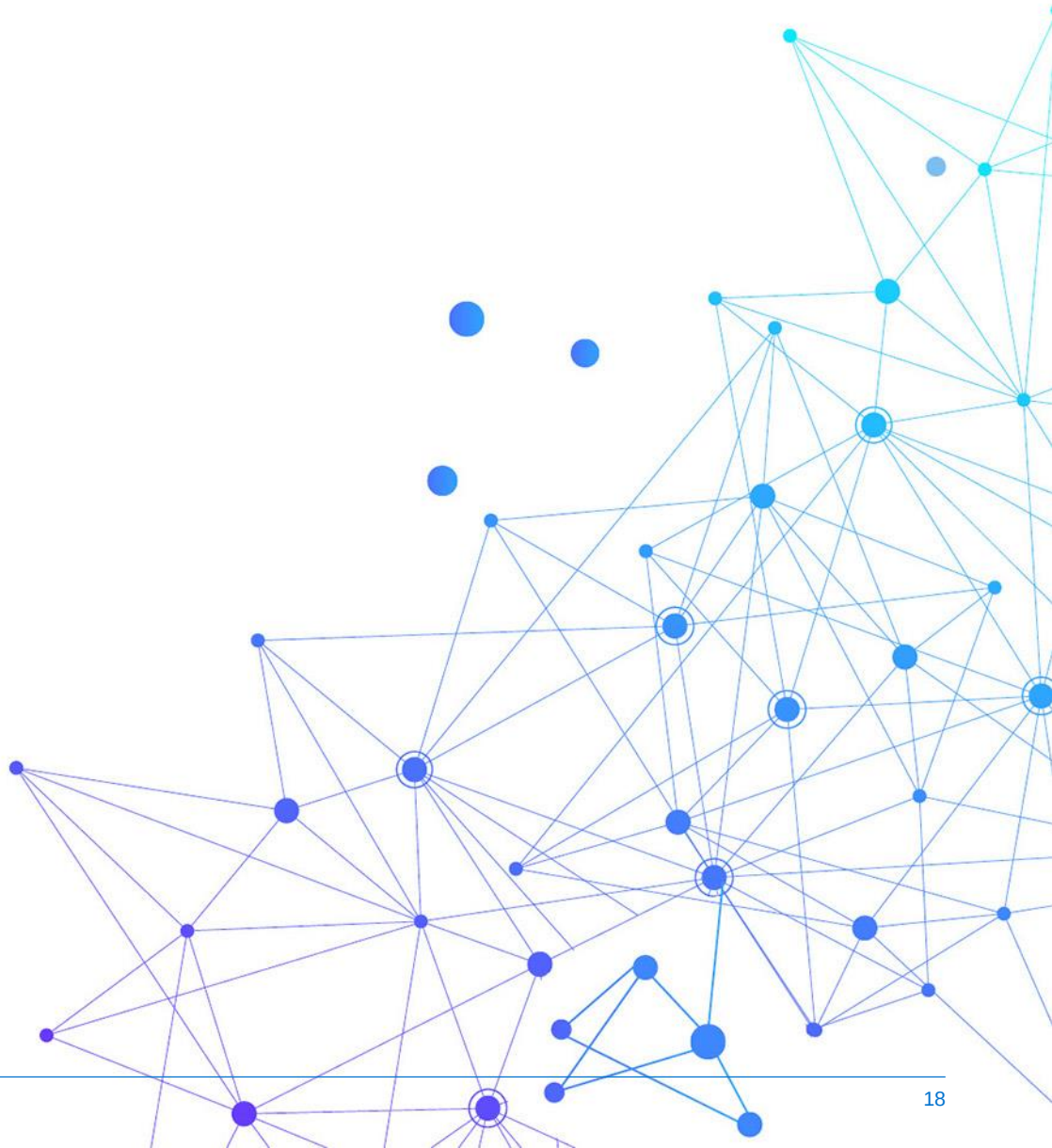
STEM OFFER obligations - examples



Facility D

- Capacity credits/RCOQ = 55
- Outage (@ 41°) = 55
- Min STEM offer quantity = 0
- Max STEM offer quantity = 0
- Not offered in PDS, not cleared in PDS.

Next Steps



NEXT STEPS

- Rule drafting

Energy Transformation Implementation Unit

Monitoring and Compliance in the WEM

10 March 2020

Drivers for change

New market design

Existing issues

Principles

- Fit-for-purpose, efficient and future-ready
- Unambiguous, transparent interpretation of obligations
- Risk-based and proportionate approach to enforcing compliance
- Compliance decisions are consistent, repeatable and predictable
- Responsive and timely compliance action
- Graduated and responsive penalty regime
- Procedural fairness and natural justice

Entity roles

Broadly retain existing roles

ERA

- Compliance and enforcement with all market rules.
- Monitoring bidding behavior esp. for market power abuse.
- Monitoring WEM effectiveness.

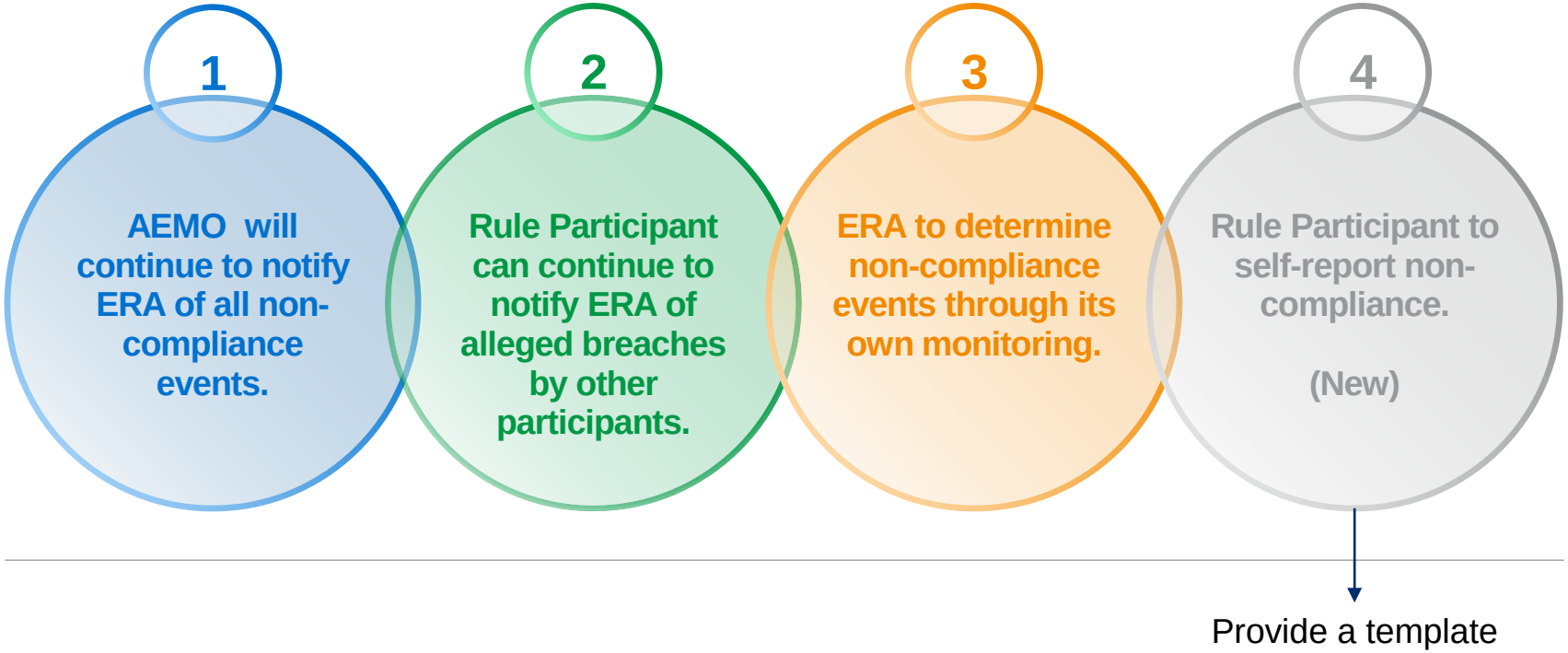
AEMO

- Real-time monitoring.
- Assist ERA in monitoring the rule participants.
- AEMO to provide more analysis for alleged breaches to assist the ERA direct investigation effort to breaches that matter.

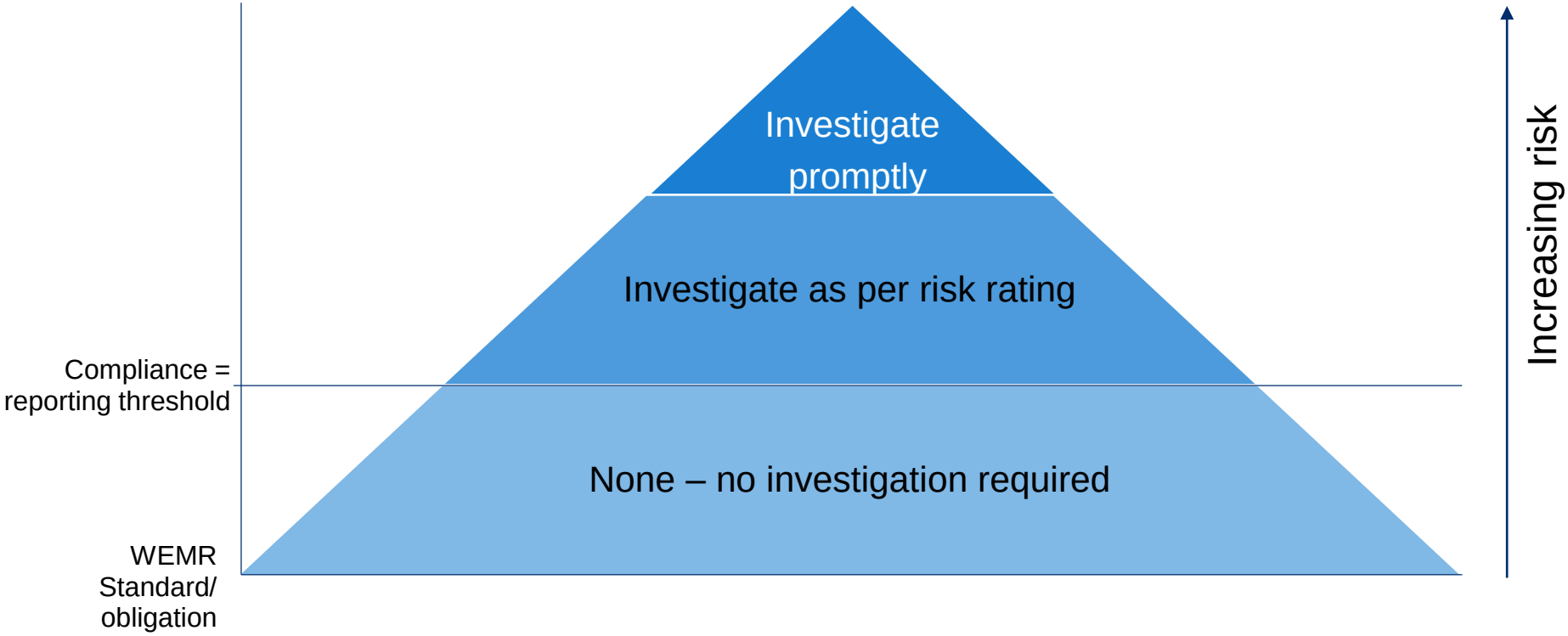
Electricity Review Board

- Responsible for appeals and consideration of reviewable decisions only.

Reporting of non-compliance events



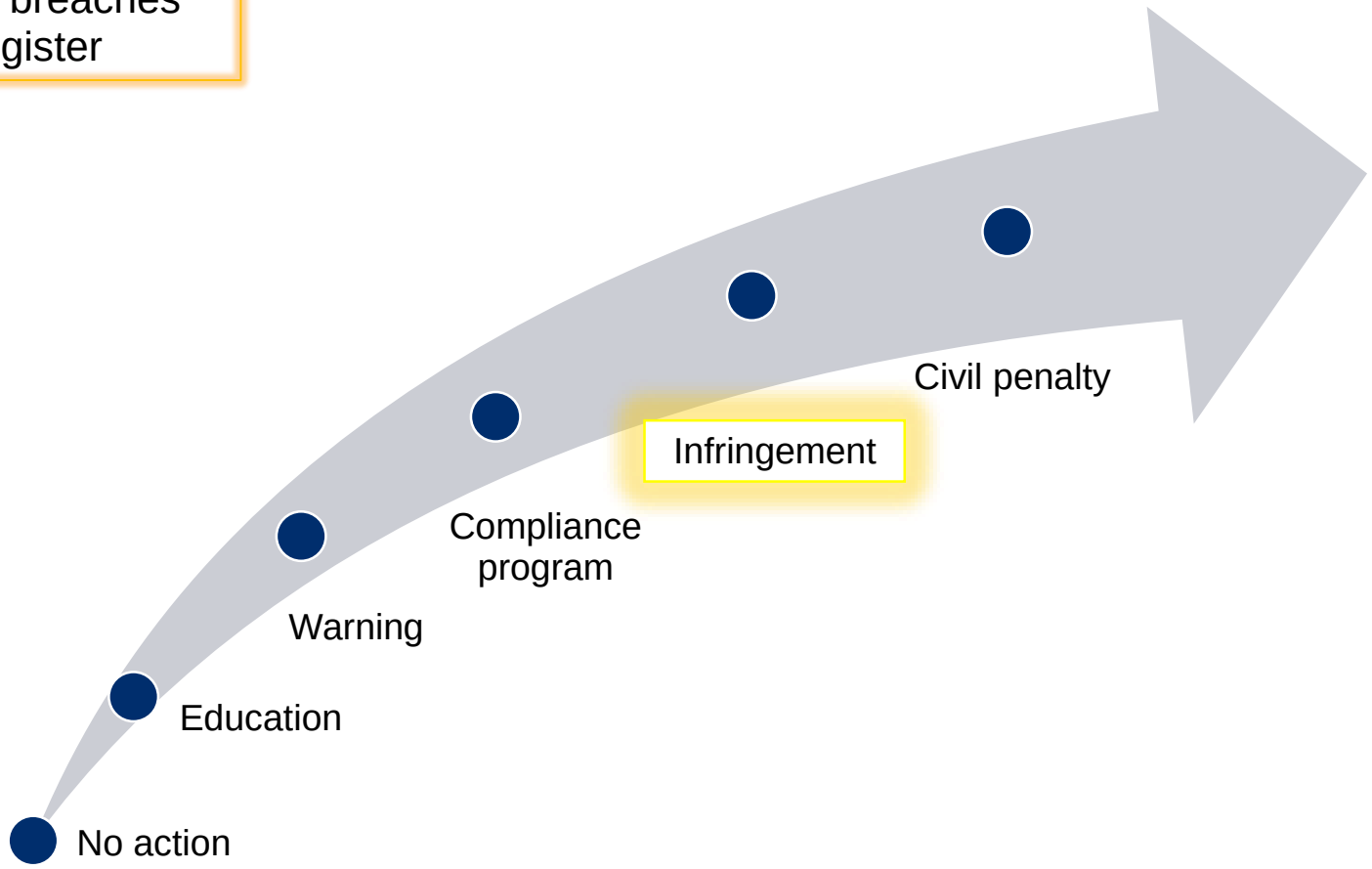
Investigations



Compliance responses

Proportionate and responsive approach

Public breaches register



Civil penalties

Current

- ERA issues Cat A civil penalty.
- ERB issues Cat B and C civil penalties.
- Penalties are fixed values with ability to increase depending on frequency of contravention.

Future

- Current values of penalties to be retained, along with ability to increase depending on frequency of contravention.
- Allow ERA to issue Cat B and C civil penalties, or a prescribed amount as a proportion of the civil penalty (e.g. infringement)
- ERA required to publish guidelines on how it determines a proportional penalty

Exclude the liable participant from the distribution of civil penalties.

Compliance amnesty

Compliance amnesty at market start

- Must be operating in good faith
- Alleged breaches will continue to be recorded

WEM effectiveness reviews

Current

- ERA responsible for monitoring market effectiveness
  - Act requires a review every 3 years.
  - WEM rules require annual review.

Future

- ERA continue to be responsible for monitoring effectiveness
  - Align timing of reviews – conducted at least every 3 years.
  - ERA to have discretion to focus on deficient aspects of the market.

Energy Transformation Implementation Unit

Generator Performance Standards

Compliance and Monitoring

10 March 2020

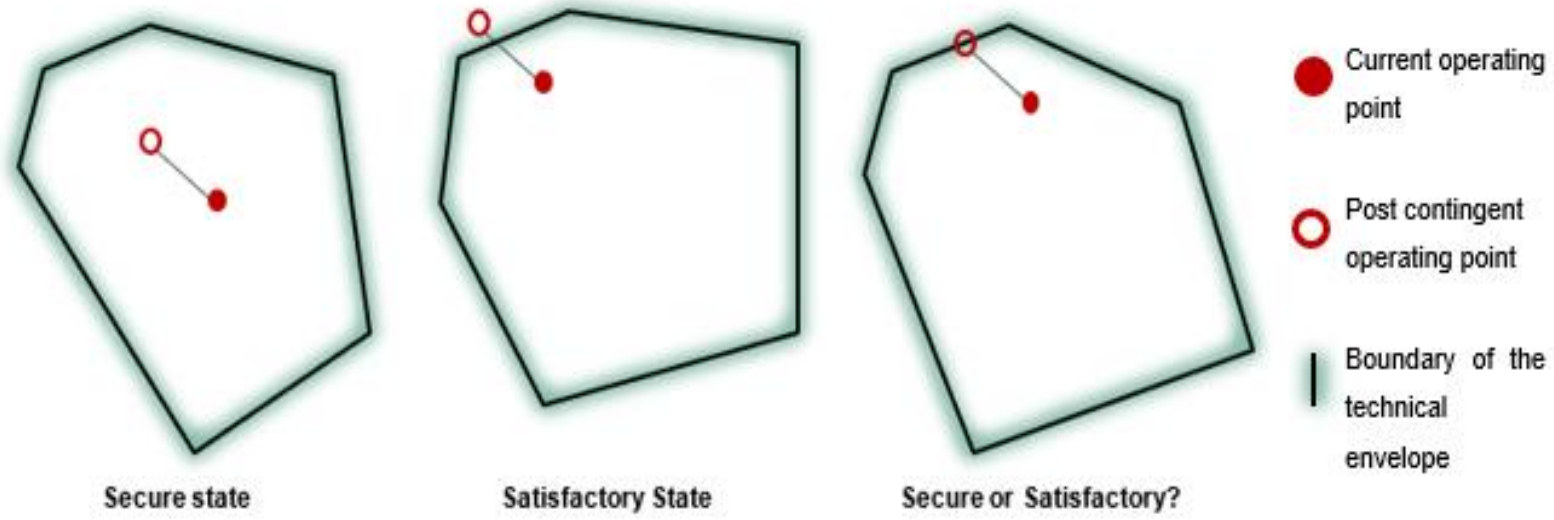
Agenda

1. Importance of generator performance standards
2. Related projects
3. Current compliance and monitoring framework
4. Problems with current framework
5. Proposed framework
6. Next steps

Importance of compliance with generator performance standards

Informs essential system services requirements

Helps to maintain power system security and reliability



Related projects

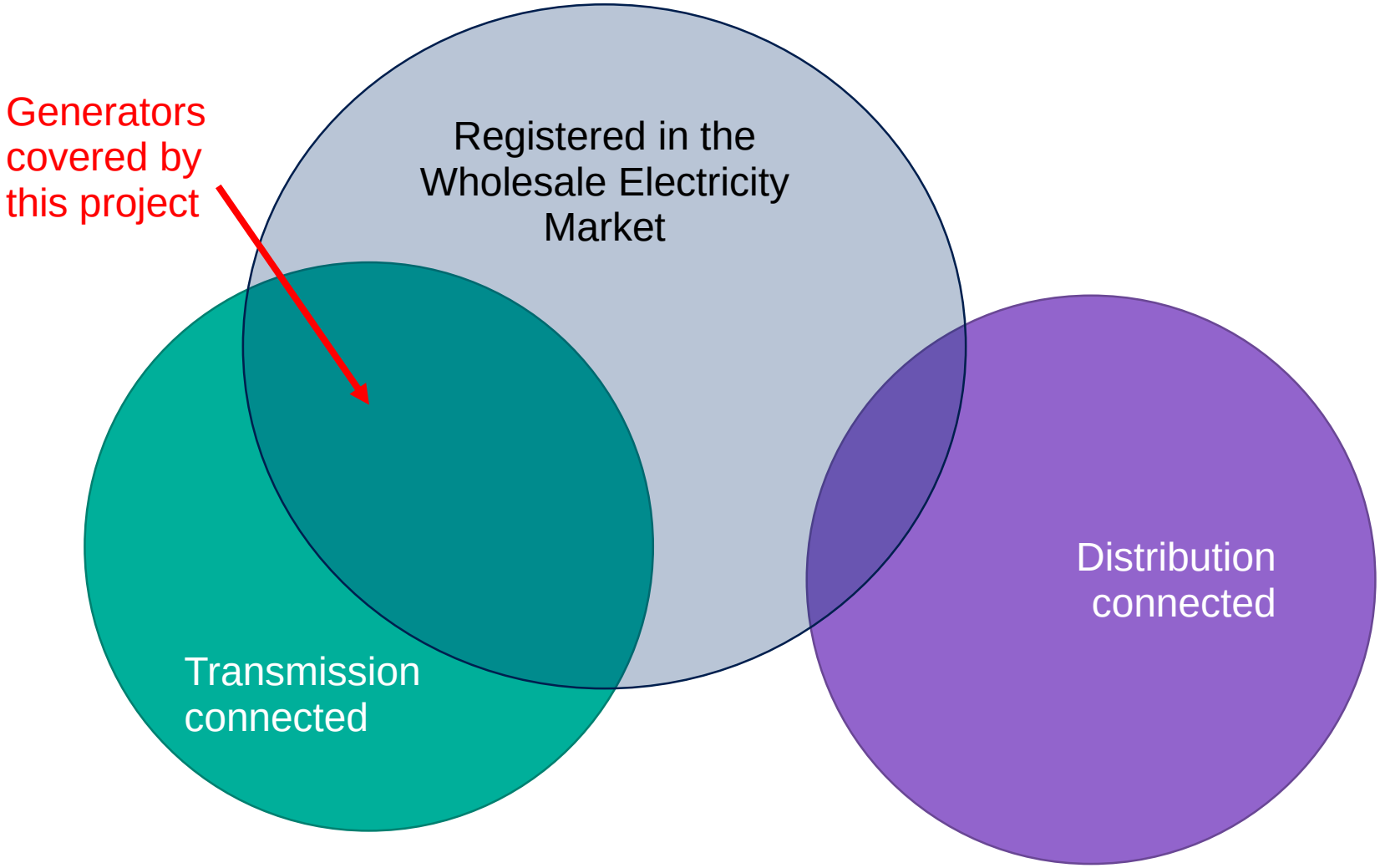
Power System Security and Reliability – Regulatory Framework

Monitoring and compliance under the WEM Rules

Generator performance guidelines

Technical Rules Review

Scope


Generators covered by this project
Registered in the Wholesale Electricity Market
Transmission connected
Distribution connected

Current compliance and monitoring framework

Record	• Standards contained in contracts between generators and Western Power.
Monitoring	• Requirements under the Technical Rules
Testing	• Requirement to maintain an up to date model • Testing where non-compliance is suspected or demonstrated
Enforcement	• Reduction in output • Disconnection

Record

Lack of visibility about contracted standards

Register of generator performance standards established under the WEM Rules

Monitoring

Low uptake of self-monitoring programs

Institute a requirement for self monitoring under the WEM Rules

No provisions give AEMO or Western Power specific functions to carry out central monitoring for compliance purposes

Give AEMO and Western Power functions that allow them to carry out central monitoring

Enforcement

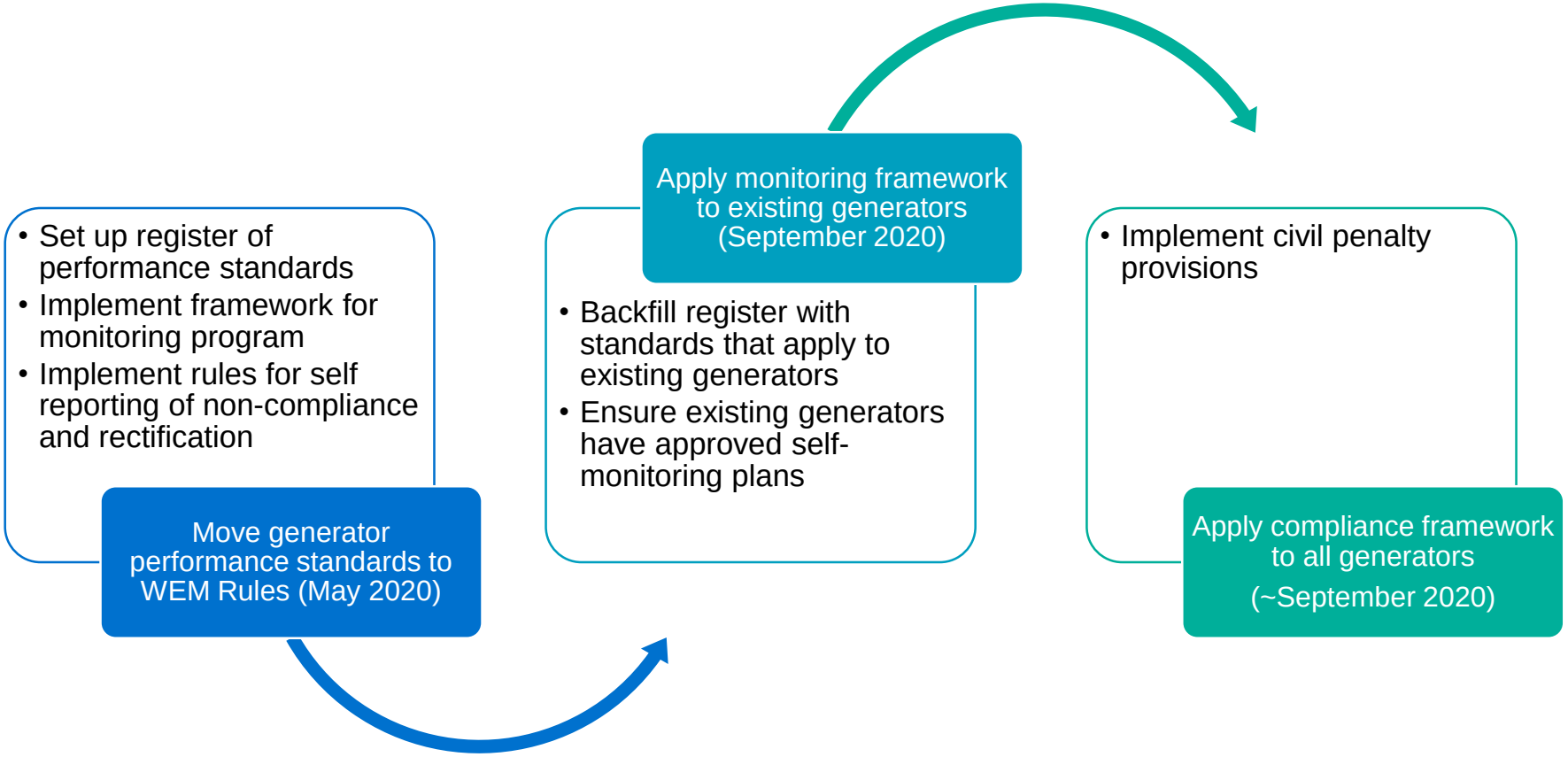
Lack of proportionate compliance responses

Introduce civil penalty provisions

Proposed framework

Record	• Register of generator performance standards
Monitoring	• Requirement moved to WEM Rules • AEMO custodian of monitoring framework • Establish central monitoring function
Testing	• Minimal change approach • May be changes to framework through other reform workstreams
Enforcement	• Introduce civil penalty mechanisms • Retain reduction in output and disconnection measures

Next steps


Move generator performance standards to WEM Rules (May 2020)
• Set up register of performance standards
• Implement framework for monitoring program
• Implement rules for self reporting of non-compliance and rectification
Apply monitoring framework to existing generators (September 2020)
• Backfill register with standards that apply to existing generators
• Ensure existing generators have approved self-monitoring plans
Apply compliance framework to all generators (~September 2020)
• Implement civil penalty provisions

Energy Transformation Implementation Unit

Supplementary ESS Procurement

10 March 2020

CONTENTS

Design considerations

In a small, concentrated market, real-time ESS market alone is risky:

- Potential scarcity (ensuring capability is available when real time arrives)
- Revenue certainty for parties incurring capital costs to provide ESS
- Ex-ante opportunity to mitigate and monitor market power

A Supplementary ESS Mechanism (SESSM) will support these factors, should as far as possible avoid distorting real-time markets, and should rely on Rule constructs rather than bilateral contracts.

Provides additional certainty for AEMO, ERA and participants.

SESSM will be applicable for all forms of ESS:

- the five frequency control ESS procured through real-time markets and cooptimised with energy in the dispatch engine Frequency Co-optimised ESS (FCESS) and other ESS (non-co-optimised ESS or NCESS).
- The triggers, form of award and cost recovery will likely be different for the FCESS and the NCESS
- This presentation describes the operation of the supplementary ESS mechanism for FCESS.

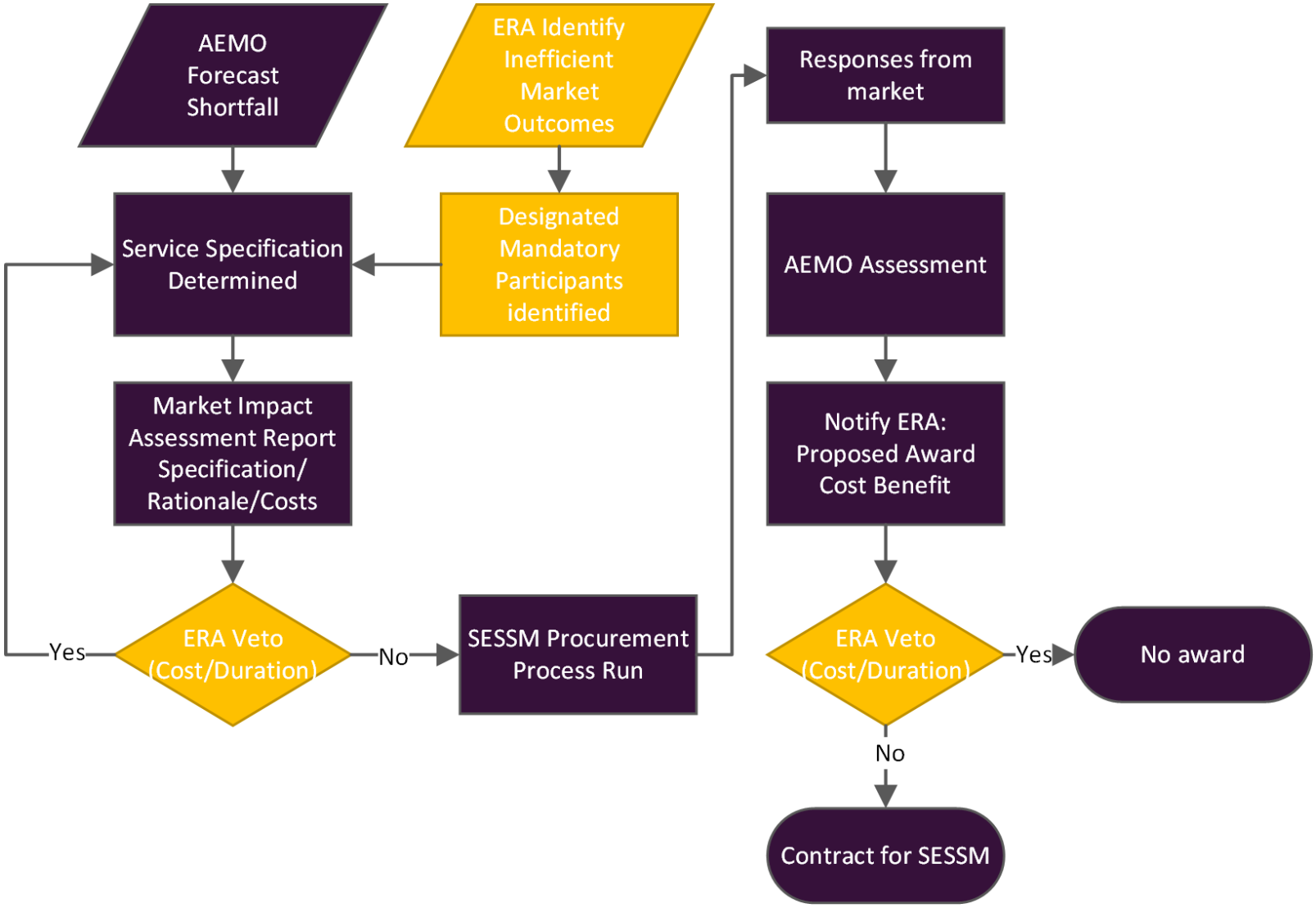
Triggers for the supplementary ESS MECHANISM

The SESSM will be run when trigger conditions are met.

For co-optimised ESS, two parties can trigger the supplementary procurement:

- AEMO, based on:
  - Forecast medium-term shortfalls in capacity accredited to provide one or more ESS.
  - Frequent short-term forecast shortfalls in capacity participating in real-time ESS markets, leading to directions to accredited facilities.
- ERA, based on inefficient market outcomes whether identified from observation of bidding patterns or from information from biennial EOIs to existing and potential entrants.

Process


AEMO Forecast Shortfall
ERA Identify Inefficient Market Outcomes
Service Specification Determined
Designated Mandatory Participants identified
Market Impact Assessment Report Specification/ Rationale/Costs
ERA Veto (Cost/Duration)
Yes
No
SESSM Procurement Process Run
Responses from market
AEMO Assessment
Notify ERA: Proposed Award Cost Benefit
ERA Veto (Cost/Duration)
Yes
No award
No
Contract for SESSM

Service specification

When the SESSM is run, the characteristics of each service to be procured will be set out in a service specification. Multiple services may be procured as part of the same process, but would be specified separately. Specification would include:

- The Service Commencement Date (when the requirement begins)
- The Award Duration (initial default of 1 year).
- The Service Timing (the time period in which availability is sought)
- The quantity of ESS sought (which may be represented by a profile over time, and may be zero at some times of year or some hours). If triggered for:
  - accreditation shortfall, the quantity would reflect the forecast shortfall
  - participation shortfall, the quantity sought would be zero in time periods where there is no pattern of frequent directions
  - Inefficient market outcomes, the quantity sought would reflect the entire forecast requirement in relevant time periods
- The minimum availability requirement, representing the percentage of the required time period which the facility must offer into the relevant real-time ESS market, and below which the facility would be subject to availability payment refunds (analogous to refunds in RCM and current SRAS contracts).

Participation

- Where AEMO has triggered the SESSM due to forecast shortfall in accredited capacity, facilities already accredited for ESS may only participate if proposing an increase in their accredited ESS capability.
- Otherwise new facilities and existing facilities without a current SESSM award may participate
- Where SESSM is triggered due to inefficient market outcomes, ERA may designate certain facilities or participants who must participate:
  - ERA can only designate registered facilities.
  - ERA cannot designate a facility for participation in a SESSM procurement for a co-optimised ESS it is not accredited for.
  - ERA cannot designate a facility which already has a current SESSM award for the relevant service.
  - ERA can only designate facilities or participants which are able to meet the service specification, e.g. they are regularly participating in and setting prices in the relevant time periods.

Submissions (1)

Submissions will be on a facility-by-facility basis, and will include proposed:

- Availability Quantity – the MW or MWs quantity of the ESS to be made available in a dispatch interval.
- Availability Payment – the fixed amount payable to the participant for offering the specified quantity into the relevant real-time market according to the service specification.
- Offer Cap – the price at or less than which the participant commits to offering into the applicable real-time ESS market, which may vary according to the time periods set out in the service specification. Participants may still include enablement costs (relating to the difference between the energy market clearing price and the cost of generating at minimum running) to real-time offers above the Offer Cap.
- Whether the offer can be accepted in part, and if so, in what divisions.

A participant may include additional offers for with different prices in its response, where the prices reflect a longer or shorter proposed duration of the award or awards for multiple services

Submissions (2)

Submissions for a facility must include:

- an availability payment that:
  - represents the fixed costs of providing the relevant service
  - accounts for any capacity credit payments (e.g. if capacity credits cover 100% of the facility, proposed availability payment should only include ESS-specific facility modifications)
- an offer cap that:
  - represents variable costs of providing the relevant service
  - excludes opportunity costs of backing off energy dispatch (handled by market clearing engine)
  - excludes enablement costs for minimum running level required to provide a service (can be included in ESS offers in relevant situations)

Submissions may include any assumptions and cost information used to develop proposed availability payments and offer caps.

Submissions will be subject to the same good faith offer obligations as the STEM and real-time markets.

Submissions (3)

Submissions for existing facilities must include:

- A comparison of proposed availability quantity to historic offer quantities over the past 12 months
- A comparison of proposed offer cap to historic offer prices over the past 12 months (with explicit adjustment for enablement costs in intervals trapped at the bottom end of the ESS trapezium)
- Information on the proportion of cleared ESS offers that related to enablement costs

Submissions for new facilities must include:

- Expected minimum enablement limit
- Expected generation cost at minimum enablement limit
- Expected start cost

Existing facilities will provide this information in Standing Data.

Selection

- While all respondents will have separate offers for each service, the selection process must accommodate alternative offers structured in different ways (duration, availability commitment, pricing).
- AEMO will assess submissions by:
  - Discarding submissions not complying with the Specification
  - Converting proposed availability payments and offer caps into a ‘per MW’ normalised reserve offer, based on the proposed availability quantity
  - Using start costs, enablement limits and minimum running cost data to identify potential enablement costs for each facility (AEMO will need to carry out market analysis to estimate enablement costs)
  - Selecting the lowest cost combination of submissions which meet the requirement
- If AEMO identifies that a more cost-effective solution could be achieved with a minor adjustment to the availability quantity offered by one or more participants, AEMO may request that the participant submit an adjusted offer, and may include any adjusted offer in its assessment process.

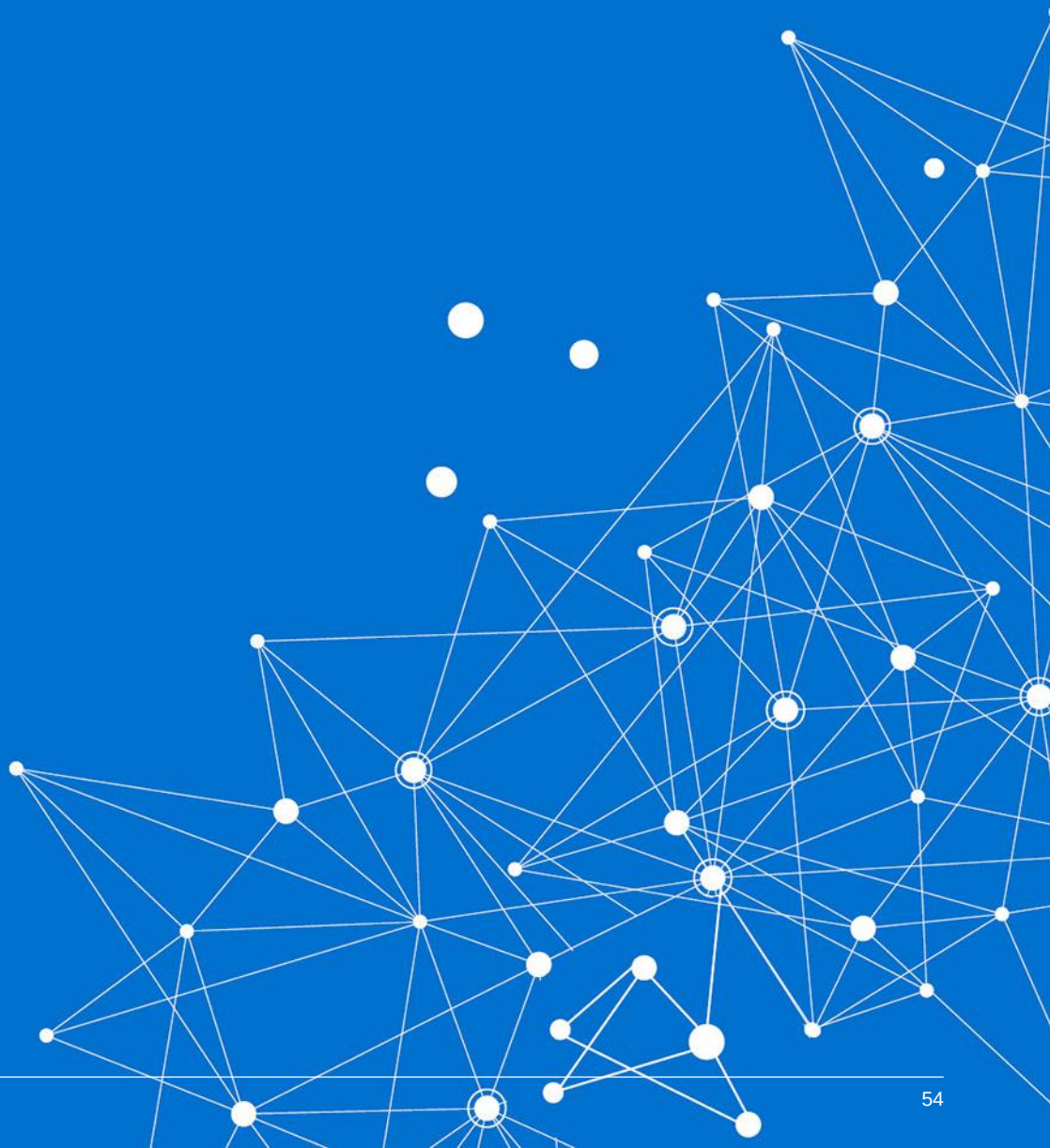
Awards

- SESSM response content will remain confidential.
- Some information about the SESSM process will be made public:
  - Number and identity of respondents
  - Final SESSM Awards:
    - Facility
    - Service specification
    - Award duration
    - Availability payment
    - Offer cap
- Participants must ensure that selected facilities are registered and accredited for the appropriate quantity of the relevant ESS.

Real-time market participation

- Participants holding awards must offer their facilities into real-time ESS markets in accordance with awards (an existing facility awarded for increased quantity must offer its new total accredited quantity).
- Facilities with awards are not guaranteed to be cleared and dispatched for the held quantities. They will only be cleared where no other facilities are cheaper in real-time.
- Where AEMO forecasts a real-time ESS shortfall in pre-dispatch (due to facility commitment plans) which requires intervention to ensure sufficient capability will be available, AEMO will direct commitment of SESSM facilities before other accredited facilities.
- AEMO will monitor revenue adequacy for ESS providers using standing data costs, with particular focus on directed facilities.

Transition arrangements



ESS accreditation ahead of market start

Owners of all facilities must provide additional standing data relating to ESS capability, including:

- MWs inertia of the facility when running
- RoCoF ride-through capability
- Startup cost
- Minimum generation cost

Existing AS providers will be required to accredit for the relevant new ESS:

- Facilities registered to provide LFAS must accredit for Regulation.
- Parties to AS Contracts for Spinning Reserve or Load Rejection Reserve must accredit for Contingency Reserve raise or lower as applicable.
- Synergy must have capable facilities in the Balancing Portfolio accredited to provide Regulation, Contingency Reserve, and RoCoF Control Service.
- Owners of other facilities may apply for accreditation to provide any of the new ESS.

Accredited facilities will be required to offer their full accredited capability in the first six months of the market.

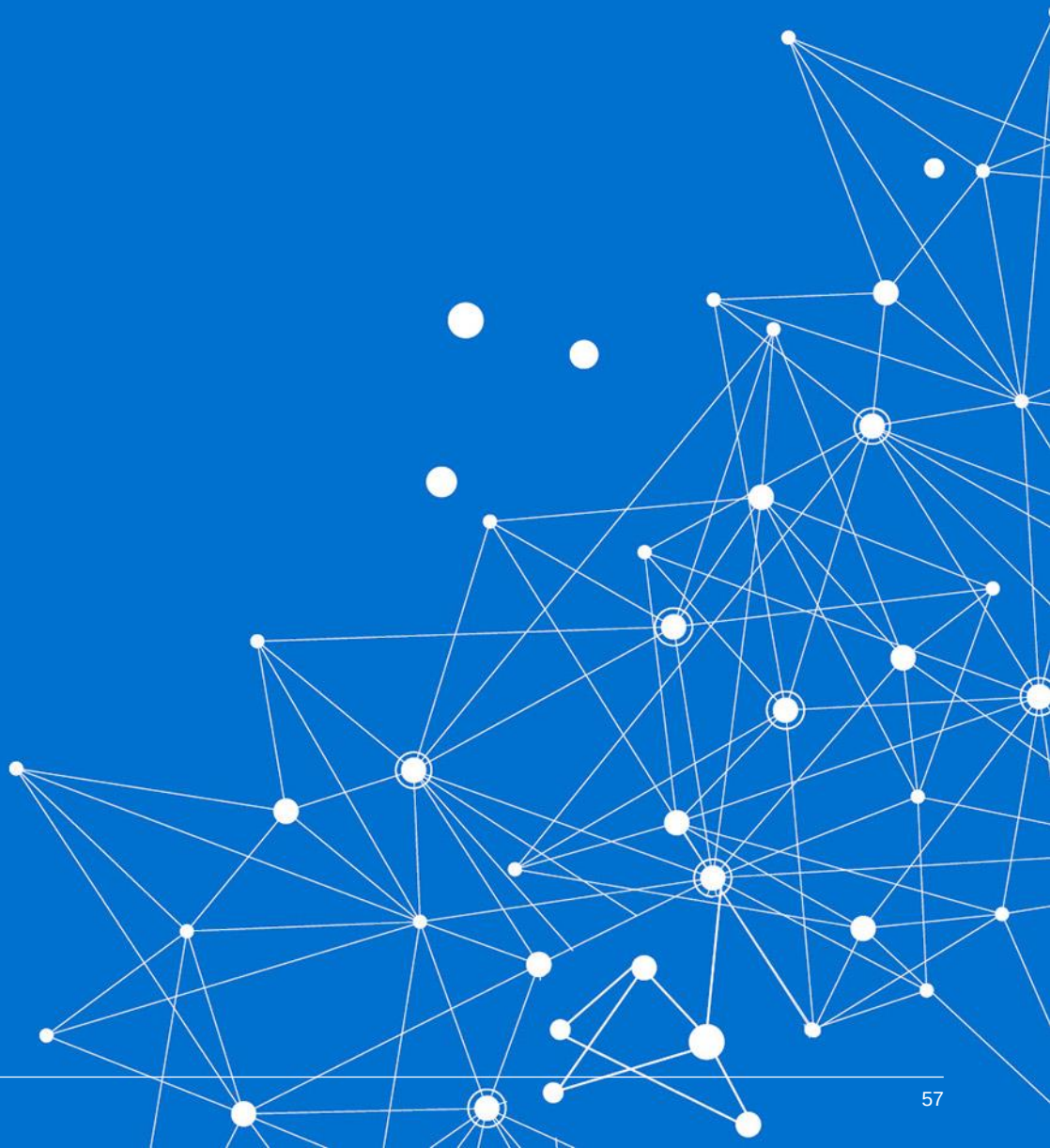
Market scan for new ESS providers

AEMO will conduct an expression of interest process, whereby potential new entrants are asked for indicative information on fixed and variable costs at which they would be able to provide services.

Owners of existing facilities not currently providing ancillary services will be asked for indicative information on:

- costs of:
  - Improving facility capability to allow accreditation for ESS
  - providing ESS (excluding start and minimum running costs)
- expected limitations on ESS provision including potential enablement limits, breakpoints, and maximum quantities

Next steps



Next steps

- Presentation of Supplementary Mechanism for NCESS
- Taskforce paper
- Rule drafting

Commissioning Plan & Process

10 March 2020

Key issues

- Commissioning tests are required to support reliable operation of equipment, and to confirm the capability of equipment to meet certain standards and provide certain services
- Tests can create risks to Power System Security and Power System Reliability, and so must be planned and coordinated
- For some tests, it can be difficult to designate specific times in advance as they are dependent on power system conditions
- The existing Commissioning Test Plan arrangements are cumbersome and do not allow for flexibility in adjusting tests close to realtime
- Testing often requires coordination between AEMO and Western Power, and the process can be confusing for participants, including understanding the information required and when it is required

The focus of these changes are to:

- Provide clarity on the various types of tests for which AEMO's approval is required
- To provide clarity on submission timelines for various type of tests, allowing for variable timeframes
- To provide greater clarity on the information requirements and approval process
- To allow certain flexibility to accommodate realtime testing requirements

Current WEM Rules Requirements and high level issues identified

- Commissioning Test is a series of activities which confirm the ability of a generating system to operate at different levels of output reliably [WEM Rule 3.21A.1]
  - **The current definition needs to expand to cover the various types of tests that we are including such as ESS accreditation, GPS compliance.**

- Market Participant conducting a Commissioning Test for a new generating system and an existing generating system that has undergone significant maintenance must conduct such tests under a Commissioning Test Plan approved by AEMO [WEM Rule 3.21A.2]
  - This rule limits the submission of CTP for the various new types of test to be covered such as demonstrating GPS compliance, demonstrating ESS accreditation.

- AEMO may approve a Commissioning Test Plan only for a new generating system that is yet to commence operation, or for an existing generating system that has undergone significant maintenance [WEM Rule 3.21A.3]
  - This rule limits the various types of test that AEMO is including for approval.

- Market Participant requesting permission for a Commissioning Test must use best endeavours to submit to AEMO its Commissioning Test Plan for approval at least 7 Trading Days prior to the start of the Commissioning Test Period [WEM Rule 3.21A.4]
  - This timeline is suitable for certain type of tests but is not suitable for commissioning of new generating system where longer timeframe is required for assessment.
- AEMO must notify a Market Participant as to whether it has approved a Commissioning Test Plan as soon as practicable but in any event no later than 8:00am on the Scheduling Day for which the Commissioning Test Plan would apply [WEM Rule 3.21A.9]
  - Need to ensure this timeframe is consistent with new SCED arrangements (e.g. Pre-Dispatch)

Principle #1

Expand the definition of Commissioning Test

- AEMO carries an obligation in the WEM to coordinate and approve the MP's Commissioning Test Plan containing Commissioning Tests.
- Under the current framework, a Commissioning Test "is a series of activities which confirm the ability of a generating system to operate at different levels of output reliably".
- With the Generator Performance Standards (GPS) moving into the WEM Rules, there will be a need to conduct tests in order to demonstrate compliance
- Additionally, with the new ESS provisions there will be a need to conduct tests to demonstrate capability to provide a service.
- The Commissioning Test definition, while reasonably broad, does not cover testing for these purposes. Therefore the definition of Commissioning Test needs to expand to cover the new types of test such as ESS accreditation, GPS compliance.
- Retain from RC_2013_15, the ability for a market participant to conduct a Commissioning Test under an approved CTP during a Planned or Forced Outage.

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Principle #2

Clarify the requirements on when to submit a Commissioning Test Plan

- Currently, there are two requirements for submitting a Commissioning Test Plan for approval;
  - An existing generating system that has undergone significant maintenance, or
  - A new generation system that has yet to commence operation.

New Design:

- Moving forward, a market participant who wishes to engage in a test of its facilities or equipment referred to in the rules or that could affect the security or reliability of the SWIS or the operation of the market must request the approval of AEMO to conduct the test.
- Retain the current obligation to submit tests, and expand on the various type of test covered for which AEMO's approval is required, including:
  - Commissioning tests of new generation facilities
  - Commissioning tests of existing generation facilities that has undergone significant maintenance (AEMO to define in market procedure)
  - Demonstrating compliance with GPS
  - Demonstrating capability to AEMO for ESS accreditation
  - Commissioning and re-commissioning tests of control, monitoring and communication systems in all transmission substations and generation facilities including new facilities
- AEMO to have an obligation to describe these conditions/tests in a Market Procedure

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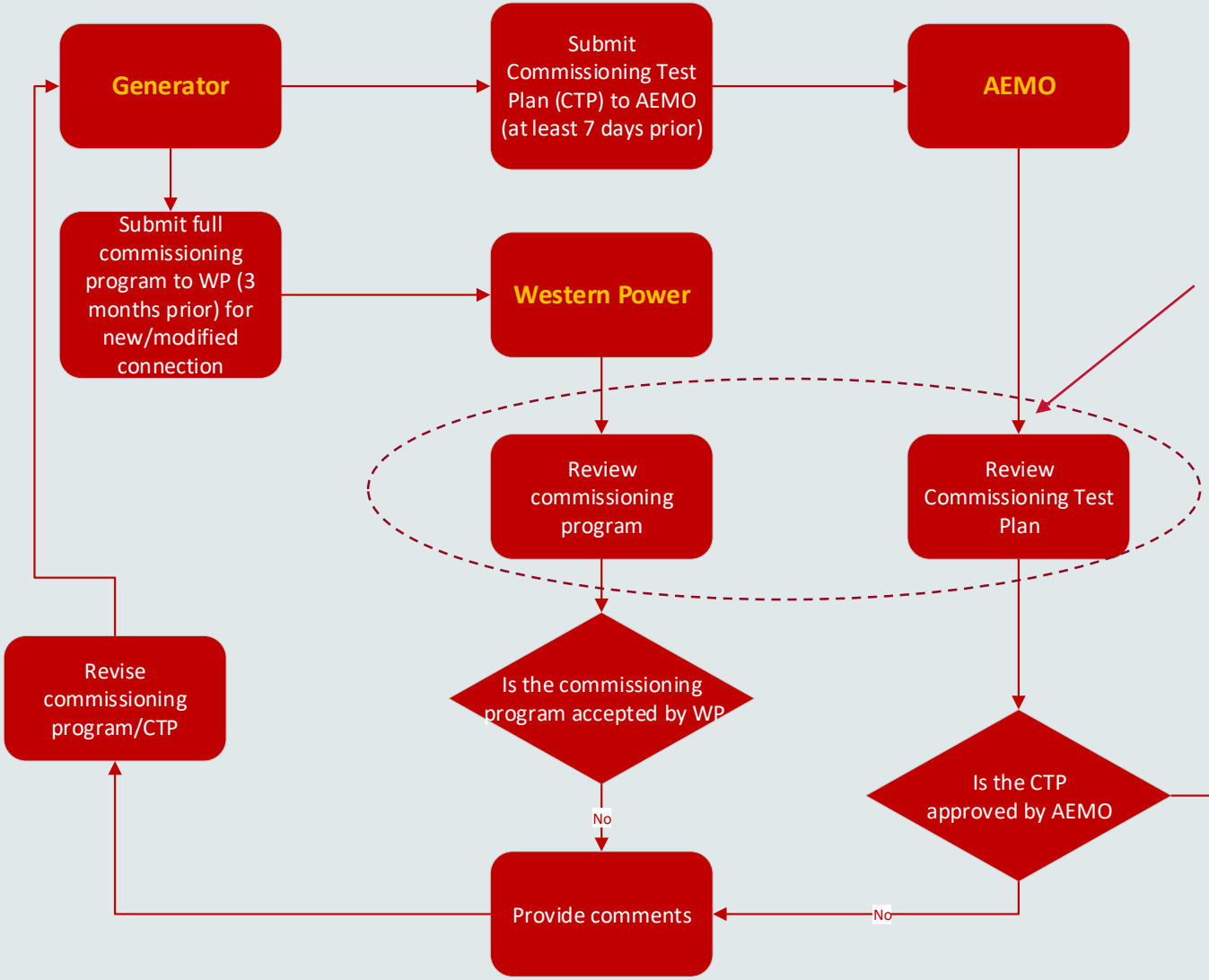
Current Process Example - Testing a new/modified generator



There are two parallel processes occurring here with different timeframes and different information requirements.

However in practice coordination is required between AEMO and Western Power in assessing the testing, and final approval of the Market Commissioning Test Plan is dependent on review of the specific details

Principle #3

Clarify the requirements on information and timing required when submitting Commissioning Test Plans

- AEMO to be able to define certain data requirements and timeframes in the Market Procedure with the WEMR defining minimum requirements. This allows for different types of information to be provided for different purposes (e.g. control system recommissioning).
  - This would include providing early visibility of the more detailed commissioning program
  - There must also be an allowance in the WEMR for AEMO to confirm details and coordinate with other Rule Participants (e.g. Western Power)
- This will provide greater flexibility to define specific requirements more easily and will minimise rule complexity.
- Some of the additional data to be considered;
  - Specific details on the equipment being tested
  - Relevant details of contracts or agreements as they relate to the test activities e.g. ETAC/Connection agreement – Approval from WP to connect
  - In addition to preferred dates/times, to also potentially include alternative dates and times for the conduct of the test activities within the commissioning window.
  - Details of special readings, curves, plots or observations, as available (e.g. expected results).

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Principle #4

Modify the timeline for Commissioning Test Plan submission

- Currently, MPs requesting permission for a Commissioning Test must use best endeavours to submit to AEMO its CTP for approval at least 7 Days, however AEMO may also reject where the request has been received less than 20 Days prior to the start of the Test.
- Additionally, participants have a requirement under the Technical Rules to submit a Commissioning Program to Western Power not less than 65 Business Days in advance for new or replacement equipment.
- The current 7 day timeline is insufficient for the more complex type of testing (although this may be acceptable for less complex testing), and there is currently no clear guidance for participants on what is required.

New Design:

- The different timeframes will depend on the type of tests being conducted. AEMO will detail the requirements for different types of tests in a Market Procedure. For example:
  - For new generator connections, participants must submit a CTP to AEMO with their commissioning program and an "indicative" profile at least 65 business days prior to the commencement of commissioning.
  - High impact test plans (e.g. large swings, trip testes, etc) must be submitted at least 20 days.
  - Other commissioning plans that are lower impact may be able to be submitted 7 days in advance.
- Participants must provide the required information within the timelines in the Market Procedure.

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Principle #5

Ensure the approval rules support the submission of required information ahead of assessment, and modify last time for approval

- Currently, AEMO must approve a Commissioning Test Plan unless, in its opinion:
  - inadequate information is provided in the Commissioning Test Plan; or
  - conducting any of the proposed activities to be undertaken at the proposed times would pose a threat to Power System Security or Power System Reliability; or
  - inadequate time to properly consider the Commissioning Test Plan has been provided
- There is little guidance for participants on what information is required in order to conduct this assessment.

New Design:

- As per current rules, AEMO will not approve the CTP when it determines that the performance of the test will have an adverse impact on the reliability or security of the transmission system. AEMO will define the more detailed assessment criteria the Market Procedure (as per current obligation).
- For the tests that require advanced notice and additional information, AEMO will include in the Market Procedure the timeframes it will use to provide initial review and response.
  - E.g. reasonable endeavours to respond to the participant within 20 business days of receipt of the commissioning program when submitted 65 days in advance
- If there is inadequate time or information provided by Participants, AEMO will not assess the CTP and notify participant of its rejection.
  - E.g. new generator commissioning that is submitted without an associated commissioning program
- AEMO will retain the obligation to notify the MP of its assessment as soon as practicable, however no later than 48 hours ahead of the start of the CTP (currently 8am on the Scheduling Day for which the CTP would apply).

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Principle #6

Include the requirements for undertaking a Commissioning Test

- As commissioning activities may impact on the power system or WEM, specific actions may be required prior to undertaking online commissioning tests.

- Submission of Offers:
  - Participants must ensure all offers associated with commissioning or testing are submitted to pre-dispatch at least 48 hours in advance to support STEM submissions.

- For some of the tests, AEMO will require that Participants to:
  - Contact AEMO control room prior to commencing a test that may impact:
    - The MW, MVAr, voltage or frequency of the generating system or
    - Has the potential to impact the performance of the generating system as outline in the Generator Performance Standards
    - Tripping of the Facility or any other test with a high risk of tripping as indicated in the CTP
  - These process will be described in the Market Procedure

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Principle #7

Allow flexibility to update CTP once its established.

- Currently a revised CTP is taken to be a new CTP (which must be subsequently approved).

New Design:

- Approval of the overarching CTP provides a "window" for which to conduct the specific tests. Minor adjustments to individual tests inside the window will not constitute a "new" CTP that is subject to the broader assessment timeframes.
- MP must not submit a revised CTP to AEMO that proposes:
  - New start and end points outside of the approved CTP (i.e. outside of approved testing "window").
  - Major changes to the indicative test program
- Per current practice, AEMO will review changes that are minor and requested with sufficient time to assess, with details to be formalised in the Market Procedure, including:
  - Participants will have obligation to adjust offers at least 2 hours prior to the commencement of the actual test to reflect any updates.
  - For certain tests, contacting the AEMO control room ahead of the test to confirm permission to proceed.
- As per the current framework, AEMO will not provide permission to proceed with the test if there is insufficient time to assess, and tests may be cancelled, delayed or altered based on system conditions.

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Generator Performance Standards

- With the Generator Performance Standards (GPS) being moved to the WEM Rules, there will be a need to demonstrate compliance as part of initial connection (as is currently the case).
- This enhanced design will support sharing information on the new facilities commissioning program to AEMO ahead of testing commencing, and liaising with Western Power to confirm the tests are acceptable to proceed.
- Given scheduling of these types of tests are required happen well in advance, the flexibility in the enhanced design to provide an indicative profile and make changes closer to actual testing time will help to manage testing uncertainty.
- Where appropriate, participants may also include other types of tests at the same time, e.g.
  - *Commissioning of SCADA systems relating to the generating system.*
  - *Demonstration of ESS capability*

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Principle #8

Include a requirement to publish the Commissioning Test Plan

- Why is there a need to publish approved CTP?
  - Improve market transparency/timeline of processes and commissioning-related information
  - Provide as much certainty as possible to AEMO and registered participants.
  - To support the information published in MT PASA, ST PASA and Pre-Dispatch
  - To allow other participants potentially impacted by the variability of commissioning to adjust their own offers and reduce impact on market costs
  - Discourage the withholding of information from AEMO.

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Commissioning Plans and Process: Next Steps

- Seek participant feedback
- Design issues to be addressed (if any)
- Drafting instructions and recommended changes to the WEM rules
- Further updates to TDOWG (if any)


Questions

Scenario - insufficient time to assess

- When Commissioning Test Plan first received, if less than 20 days prior to commencement of Commissioning Test Period, then AEMO will determine whether sufficient time is available to assess.
  - AEMO will determine based on the individual circumstances of each Commissioning Test Plan as per the timeframes defined in the Market Procedure
- If Commissioning Test Plan or Modified Commissioning Test Plan is received such that there is insufficient time to assess 48 hours ahead of the start time
  - AEMO will reject the Commissioning Test Plan
  - AEMO will negotiate with the Market Participant to identify a satisfactory time for the Commissioning Test Plan which can be approved
- When an update to a specific Commissioning Test within the window is received :
  - AEMO must assess whether there is sufficient time to approve
  - If the modified plan does not include unreasonable increases in risk to the power system, then AEMO will assess the change for approval
  - If AEMO does not have sufficient time to assess, the proposed change will be rejected

Scenarios – dispatch and operation

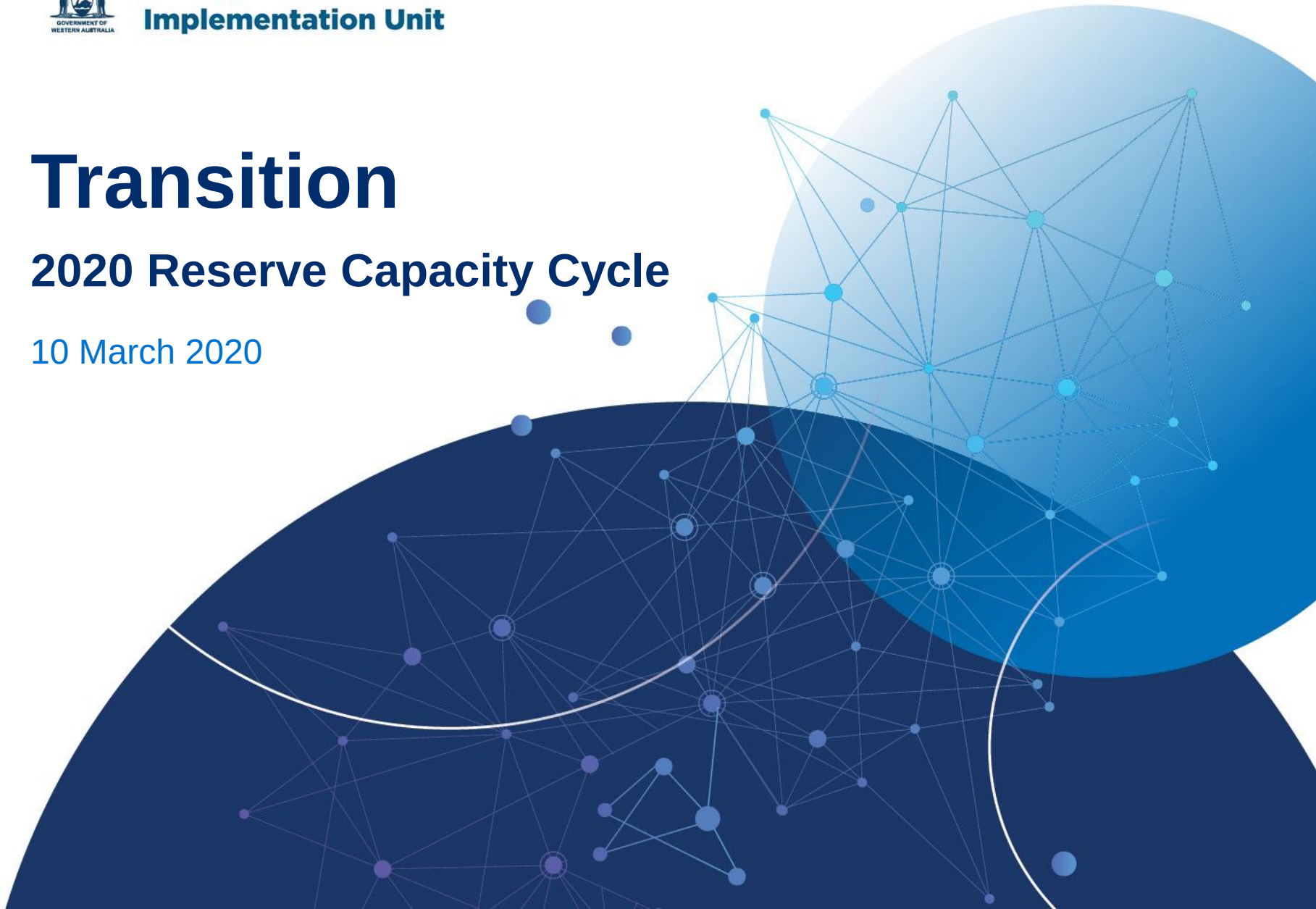
- Dispatch of Facility for Commissioning Test Plan
  - Market Participant must conform to the Commissioning Test Plan approved by AEMO
  - Offers must be in accordance with most recently approved/updated CTP
  - AEMO will dispatch in accordance with the overarching Dispatch Algorithm (i.e. subject to offers, forecasts and constraints)
  - Market Participants must comply with the most recently issued Dispatch Instruction
- Operation of Facility for Commissioning Test Plan
  - Synchronisation must be in accordance with the CTP
  - If the Market Participant cannot conform to the approved CTP then it must notify AEMO and (if it still wishes to complete the Commissioning Test) submit a change to the Commissioning Test Plan with sufficient time provided for AEMO to assess.
- Delay of Commissioning Test by AEMO beyond Trading Interval but within Commissioning Test Period
  - If a specific test is not required (such as a trip test) and Facility can still comply with Dispatch Instruction then a Modified CTP is not required
  - Otherwise:
    - An update to the Commissioning Test Plan is required

Energy Transformation Implementation Unit

Transition

2020 Reserve Capacity Cycle

10 March 2020



Transitioning to new arrangements

Objectives:

- Do not disrupt the investment plans of new entrants in the 2020 Cycle.
- Provide an opportunity for the new RLM approach to be implemented before NAQ is assigned.
- Achieve the intent of the reform – provide investment certainty to existing capacity resources from impact of new entrants.

Approach:

- Run the 2020 Cycle as usual.
- Defer NAQ assignment until 2021 Cycle.
  - Allows up to one year for new RLM to be implemented.
- Adopt transitional arrangements for the 2021 Cycle to define:
  - ‘existing’ facility as a facility that was accredited in 2020 Cycle.
- New enduring arrangements apply from the 2022 Cycle.

Meeting close

- Questions or feedback can be emailed to TDOWG@energy.wa.gov.au

- The next meeting will be communicated via email.