



**Energy Transformation
Implementation Unit**

Transformation Design and Operation Working Group Meeting 5

25 November 2019





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.



Agenda

- Proposed changes to the Electricity Networks Access Code 2004
- Market settlement

Proposed Changes to the Electricity Networks Access Code 2004



Why the Access Code is important?

The Electricity Networks Access Code 2004 (Access Code) establishes a framework for third party access to electricity networks



Shapes Western Power's services, performance targets and revenue (\$1.76 billion in 2018-19)¹



Ensures efficient investment in the electricity network



Western Power grid connects over 2 million customers²



Approx. 45% of energy prices are transmission and distribution costs³

1 Western Power Annual Report 2019

2 Western Power Annual Report 2019

3 Economic Regulation Authority Switched On: Energy Consumers Guide, 29 October 2019

Time for an upgrade



Nokia 2300



Motorola Razzr

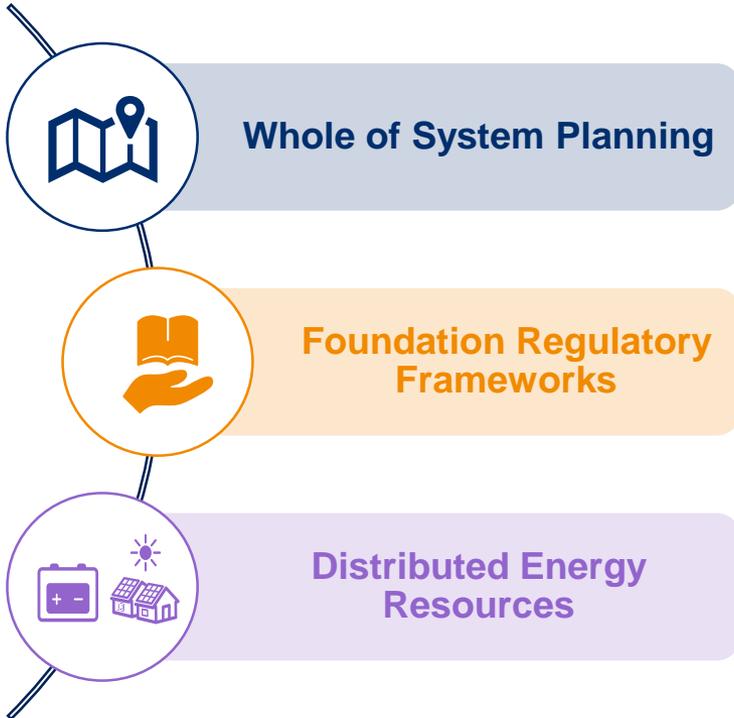
Despite the rapid energy transformation, the Access Code has remained relatively unchanged since its inception in 2004

Changes to the Access Code are required to support the delivery of the Energy Transformation Strategy and the three underpinning work streams

This will be the first time the State Government is undertaking significant changes to the Access Code in 15 years

Proposed changes to the Access Code

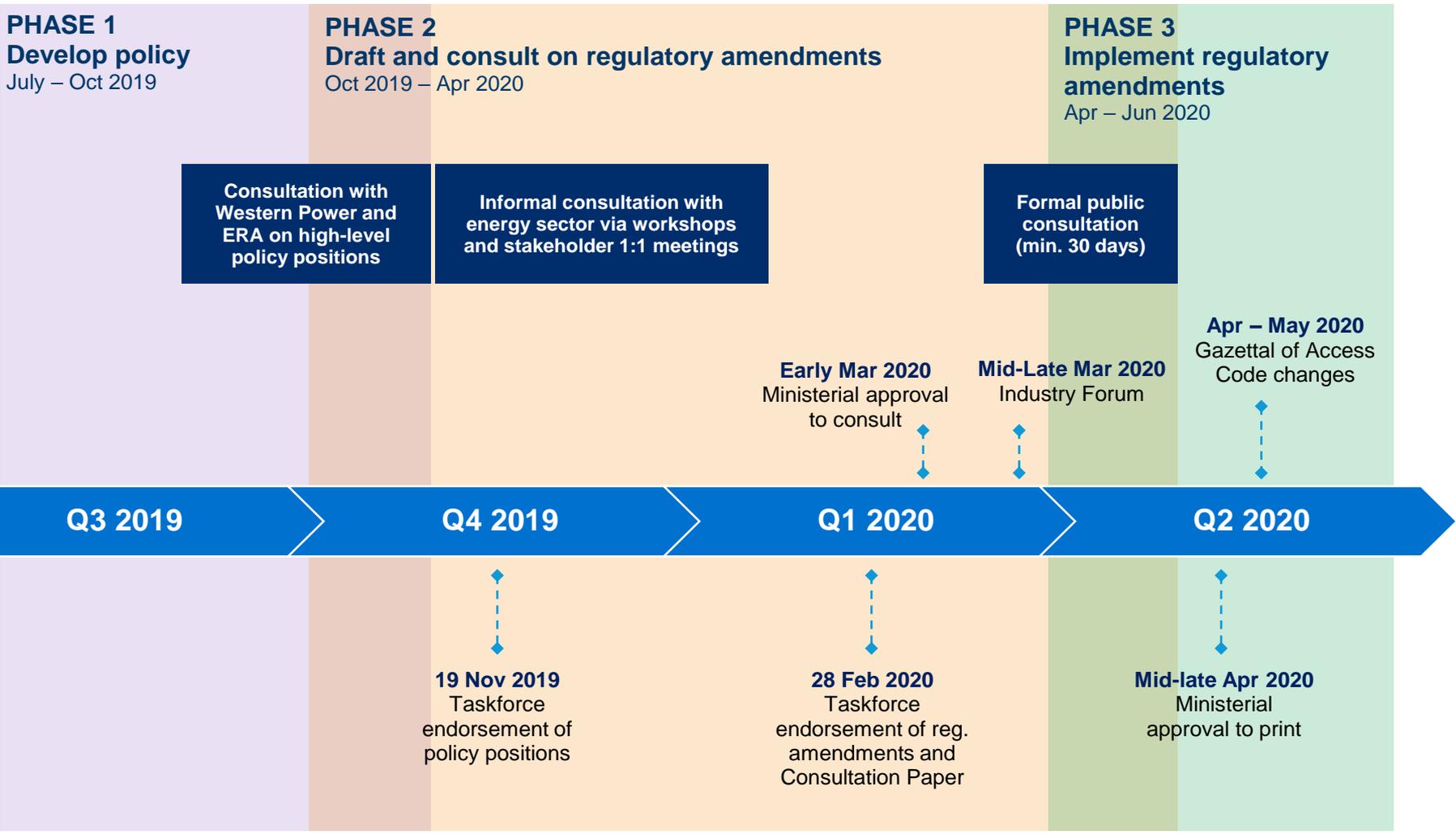
Supporting the Energy Transformation Strategy



The proposed changes seek to achieve the following objectives:

- 1** Increasing opportunities for new technologies
- 2** Maximising the utilisation of the existing Western Power network
- 3** Providing regulatory certainty and streamlining the access arrangement process

Project timeframes



Next steps



Drafting of regulatory amendments and Consultation Paper

October 2019 – February 2020



TDOWG and stakeholder 1:1 consultations

November 2019 – January 2020



Workshops on draft regulatory amendments

December 2019 – January 2020



Taskforce endorsement before seeking Ministerial approval to consult formally

February 2020



Formal public consultation

March – April 2020

Market settlement

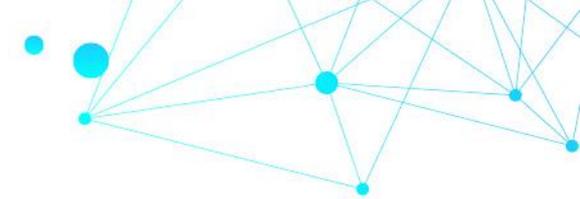


Agenda

- Implementation of five-minute settlement
- Uplift payments
- Manual overrides of SCED
- Frequency ESS settlement
 - Payments to providers
 - ESS cost recovery
- Non-frequency ESS
 - System restart



Background

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- The new Wholesale Electricity Market (WEM) will continue to be settled net of STEM and bilateral contract positions.
 - Energy payments methodology will be unchanged, including continuing to be settled on a 30-minute basis.
 - A principle to be applied is that facilities should not be double-paid for any service.

Implementation of five-minute settlement





Settlement recap

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- On 20 September 2019, the Taskforce endorsed the design decision that *dispatch and settlement intervals will be aligned to both be five-minutes. Timing of implementation will be at a future date following commencement of market arrangements.*
 - Question to be addressed – when and how will five-minute settlement be implemented?



Implementation of five-minute settlement

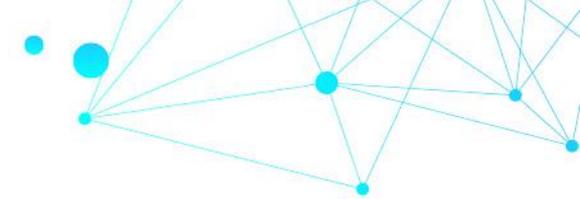
- It is recommended five-minute settlement is implemented from 1 October 2025, following deployment of five-minute metering.
- Timeframe allows market participants, Western Power and AEMO readiness
- Implementation will require:
 - New metering ICT systems: August 2020 – February 2022
 - Meter infrastructure upgrades: February 2022 – mid 2025
 - WEM and metering and settlement system changes
 - Regulatory changes: Metering Code and Metrology Procedures

Uplift payments



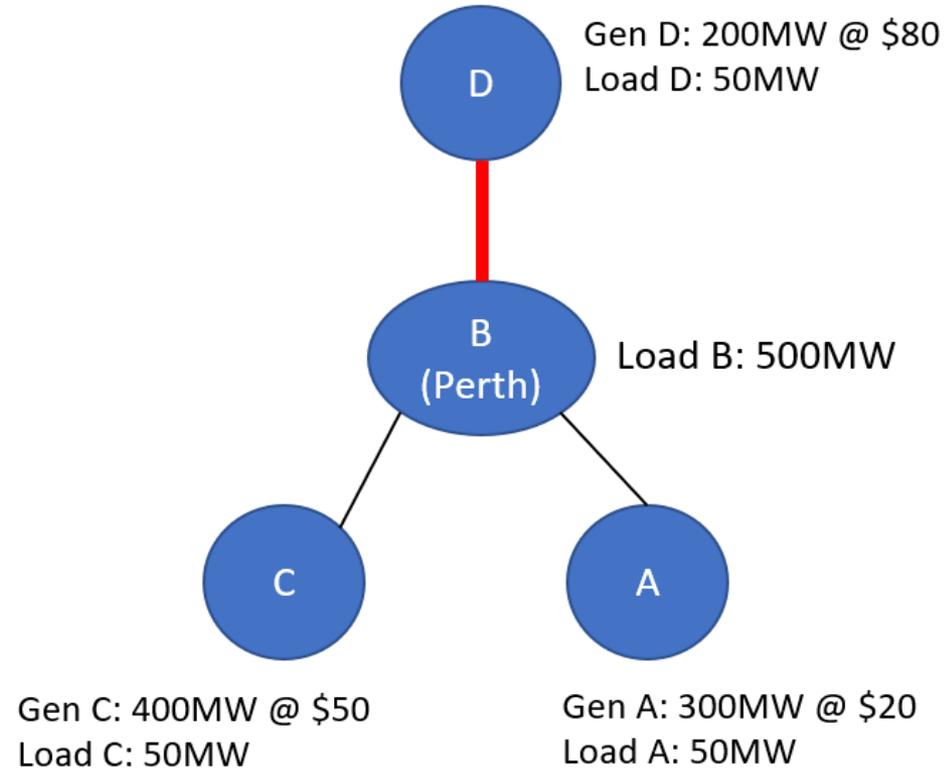


Overview

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- In August 2019, the Taskforce endorsed the design decision to retain constrained-on payments in the new market.
 - Constrained-on payments will now be called uplift payments.
 - The purpose of uplift payments is to make a generator ‘whole’.
 - An uplift payment will only be provided if the generator is dispatched due to a network constraint and the reference node price is less than its marginal offer price.
 - In the new market, there are several circumstances when a generator may not be made whole for energy, but will be made whole via other mechanisms

Negative mispricing

- Generator C is the marginal generator for locations A, B and C. The market clearing price is \$50.
- A constraint requires Generator D to generate 50MW. Its marginal offer price is \$80.
- $\$80 > \50 , and therefore Generator D is negatively mispriced.
- An uplift payment will be provided to Generator D to 'make it whole'.
- Provision of an uplift payment assists mitigate incentives for disorderly bidding.





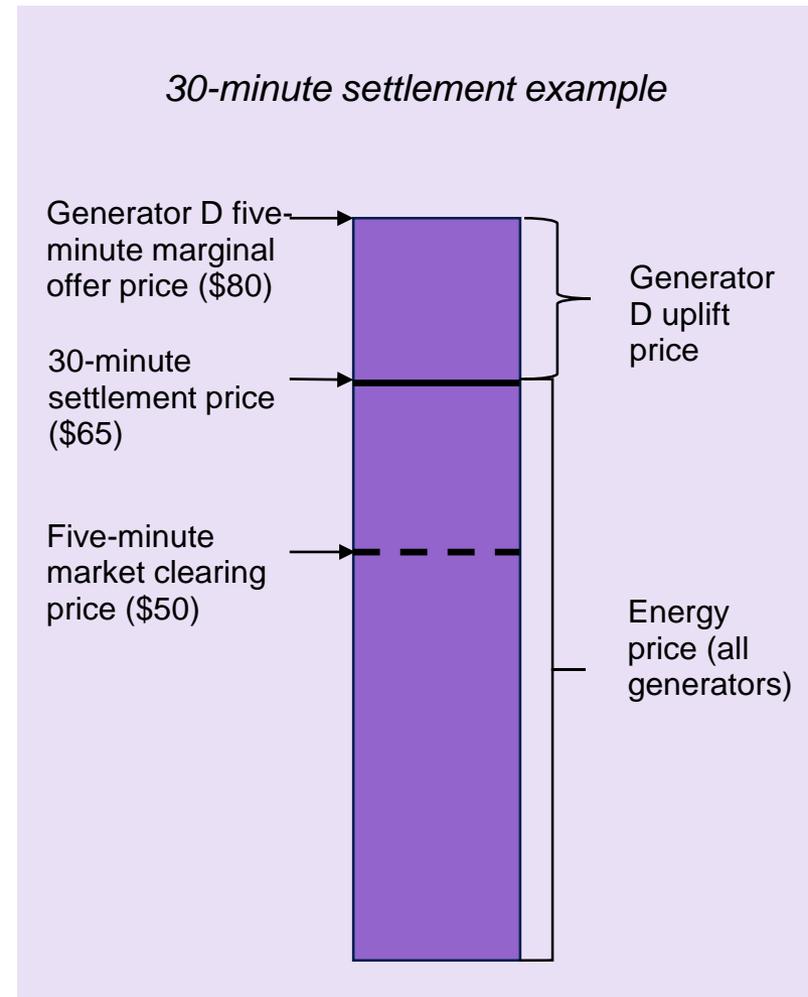
Uplift trigger

A facility is eligible for an uplift payment if all of the following criteria are met:

- The facility's congestion rental contributions $>$ zero; and
- The facility's marginal offer price $>$ market clearing price
- A facility will not be paid an uplift payment if it is dispatched due to a frequency ESS constraint.
- Further work underway on interactions with facility that may be contracted for a locational ESS.

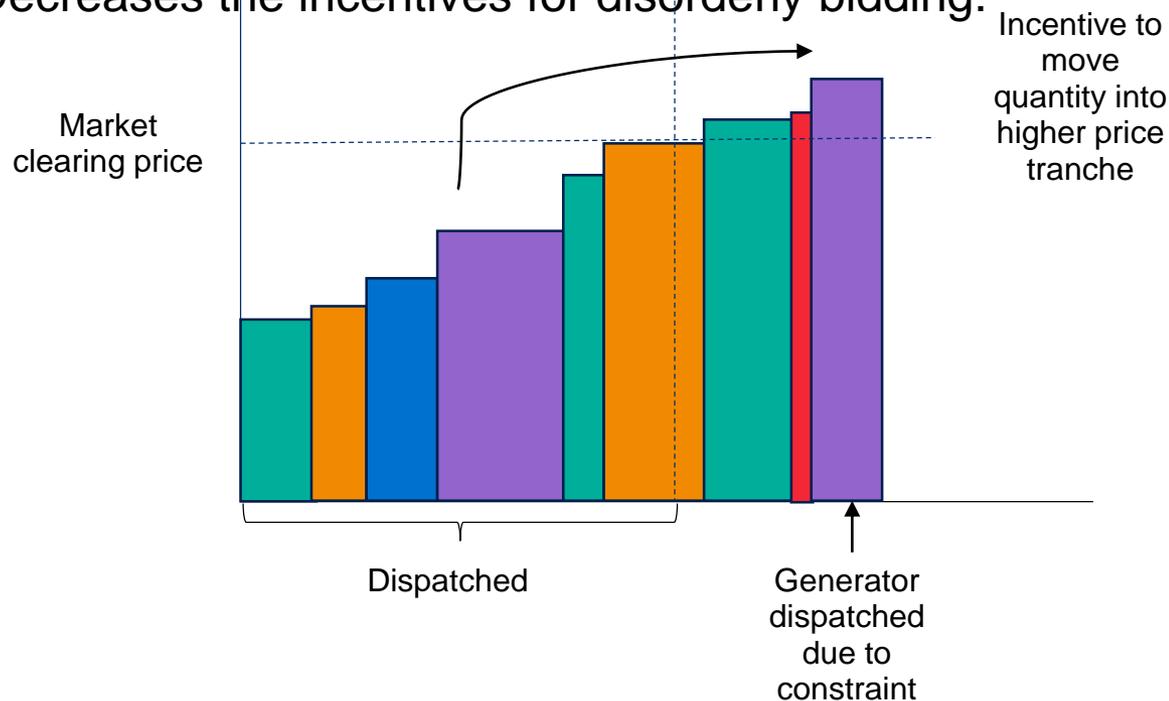
Uplift payment calculation - price

- The 30-minute settlement price will be calculated as the time-weighted average of the six five-minute market clearing prices.
- Generator D will continue to receive its energy price.
- The proposed uplift price is:
Generator D's marginal offer price – 30-minute settlement price



Uplift payment calculation - quantity

- Uplift payment will be provided for the entire quantity facility is dispatched for in the five-minute dispatch interval.
 - Consistent with the principle of marginal pricing applied in energy market.
 - Decreases the incentives for disorderly bidding.



- Uplift quantity for a facility for a dispatch interval will be calculated using 30-minute metered quantity and pro-rated to five-minute values using SCADA.



Uplift payment calculation - summary

Uplift payments will be calculated for each 5 minute dispatch interval as:

UPLIFT PRICE

(Five-minute marginal offer price of negatively mispriced generator less 30-minute settlement price)

multiplied by

UPLIFT QUANTITY

(Total quantity dispatched for the generation facility for the five-minute dispatch interval)

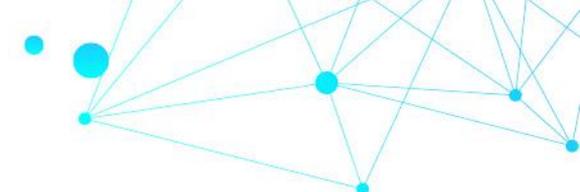
Uplift payments will be recovered from market customers.

Manual overrides of SCED





Manual overrides of SCED

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- AEMO may need to manually override SCED. For example:
 - The dispatch engine can not solve for a feasible solution
 - In an emergency situation
 - Any over-rides should last for a low number of intervals before a constraint equation is implemented.
 - Instances of manual over-rides will be monitored and addressed through market evolution if needed.

Frequency ESS settlement



Taskforce endorsed principles

Service	Principles
Regulation	<p>The costs of Frequency Regulation services in each interval will be recovered from the causers of frequency deviation according to their contribution to the requirement.</p> <ul style="list-style-type: none">• Intermittent generators according to their deviation from forecast.• Scheduled generators according to deviation from dispatch.• Loads according to their volatility.
Contingency Reserve	<p>The costs of Contingency Reserve in each interval will be recovered from the causers of frequency deviation (or a proxy) according to their contribution to the requirement.</p> <ul style="list-style-type: none">• Retain use of runway method for cost allocation of Contingency Reserve for generation contingencies.• Use interval-by-interval values for scheduled and intermittent generation and facilities behind a network constraint.• Include total generation of generators associated with intermittent loads in the runway calculation, except where a generator trip would not affect the total withdrawal or injection at the meter.• Recover costs of Contingency Reserve for load contingencies from all market customers according to their share of consumption in the trading interval.
RoCoF	<p>The costs of RoCoF Control Service will be shared between generators (based on their RoCoF ride-through capability) and loads (including as proxy for network).</p>



Payments to ESS providers



Five-minute payments to ESS providers will be calculated as:

Supplementary mechanism payment (if applicable)

(ESS performance factor x contracted MW x price)

Real Time Payment

(ESS performance factor x enablement MW x five-minute ESS market clearing price)



Regulation raise and lower cost recovery

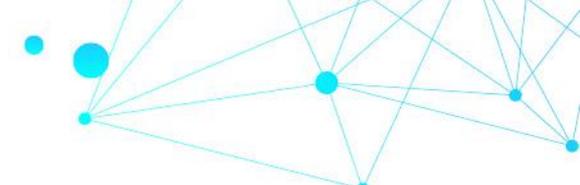
- The **current approach** will continue until 1 October 2025 when five-minute settlement is implemented.
 - **The total cost of regulation raise and regulation lower will be allocated to intermittent generators and loads based on their share of 30-minute metered generation and consumption.**
- From 1 October 2025 with 5MS, cost-recovery will be more accurately applied on a causer pays basis as five-minute metered data will be available:
 - **Scheduled generators and scheduled loads** based on their deviation from their dispatch targets.
 - **Intermittent generators** based on their deviation from their forecast unless curtailed.
 - **Loads** based on their inter-interval variation in consumption.



Contingency raise cost recovery



- Retain full runway method of cost allocation
 - ✓ Use five-minute cleared energy and ESS outputs from dispatch engine to implement runway
- Only the **largest network contingency** will be included in the runway allocation.
- Causer pays principle works when the entity paying the costs has the information and incentives to minimise those costs

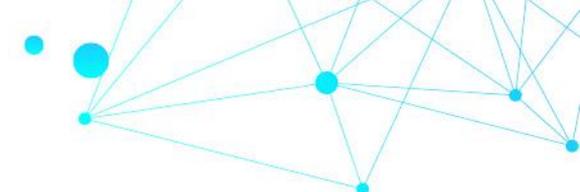


Contingency lower cost recovery

- Recovered from **loads** in proportion to their 30-minute metered consumption
- From 1 Oct 2025, cost recovery will be on a five-minute basis using five-minute metered consumption data



RoCoF cost recovery

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- RoCoF is a service the need for which is caused by everyone on the system
 - generators, network and loads
 - Causer pays scheme incentivises entities to improve their performance to RoCoF standard and reduce/remove exposure to costs of service
 - Proposed transitional period from market start:
 - ✓ AEMO determines a max forecast RoCoF level which if all generators/loads/network components can ride-through, no RoCoF service would be required
 - ✓ Only paid for by participants with ride-through capability lower than the max level
 - RoCoF cost allocation to generators will be based on metered generation and consumption:
 - ✓ 30-minute metered data at market start
 - ✓ Five-minute metered data from 1 October 2025.

Non-frequency ESS settlement



Non-frequency ESS

Service	Changes required	Cost recovery approach
System restart	Consistent with current arrangements	Recovered from loads in proportion to their consumption
Non-cooptimised ESS	TBD – Will be covered in the non-cooptimised ESS paper	



Meeting close

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- Questions or feedback can be emailed to TDOWG@energy.wa.gov.au
 - The next meeting is a drafting workshop on the WEM Rule amendments for the governance of constraint equations. An invite has been sent for Wednesday 11 December.