Security Enablement Procedures consultation stakeholder forum

Improving Security Frameworks (ISF) implementation

10 April 2025

1. Welcome

We acknowledge the Traditional Custodians of the land, seas and waters across Australia. We honour the wisdom of Aboriginal and Torres Strait Islander Elders past and present and embrace future generations.

We acknowledge that, wherever we work, we do so on Aboriginal and Torres Strait Islander lands. We pay respect to the world's oldest continuing culture and First Nations peoples' deep and continuing connection to Country; and hope that our work can benefit both people and Country.

'Journey of unity: AEMO's Reconciliation Path' by Lani Balzan

AEMO Group is proud to have delivered its first Reconciliation Action Plan in May 2024. 'Journey of unity: AEMO's Reconciliation Path' was created by Wiradjuri artist Lani Balzan to visually narrate our ongoing journey towards reconciliation - a collaborative endeavour that honours First Nations cultures, fosters mutual understanding, and paves the way for a brighter, more inclusive future.

Read our RAP

Objectives of today's session

1.

Provide an understanding of the Security Enablement Procedures

2.

To facilitate industry consideration of AEMO's proposal

3.

To encourage consideration of further engagement during consultation timeframe

Agenda

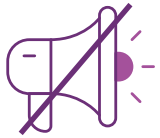
#	Time	Topic	AEMO presenters
1	1:00 – 1:05PM	Welcome & Objectives	Ulrika Lindholm
2	1:05 – 1:10PM	Context • Key elements of ISF rule	Alice Michener
3	1:10 – 1:20PM	Implementation approach • Evolving approach • Participant impact	Sam Oosterholt
4	1:20 – 2:10PM	Security Enablement procedures • Enablement methodology and principles • Minimum system security requirements • TNSP system security services agreements • System security services enablement • Stable voltage waveform requirements	Ruth Guest Sam Oosterholt
5	2:10 – 2:15PM	Next Steps	Ulrika Lindholm
6	2:15 – 2:30PM	Q&A	Ulrika Lindholm
7	2:30PM	Meeting Close	

Appendix A: Competition law meeting protocol

"Please note that this meeting will be recorded by AEMO and may be accessed and used by AEMO for the purpose of compiling minutes. By attending the meeting, you consent to AEMO recording the meeting and using the record for this purpose. No other recording of the meeting is permitted"

General Housekeeping

1. Please mute your microphone when not speaking.



2. We look forward to your feedback and questions. Use the 'Chat' function to ask any questions or comments throughout the session.
   - AEMO SMEs are on the call, who will attempt to respond in the chat.

3. Key questions or comments will be addressed verbally in dedicated Q&A sections.
4. In attending this meeting, you are expected to:
   - Contribute constructively.
   - Be respectful, both on the call and in the chat.

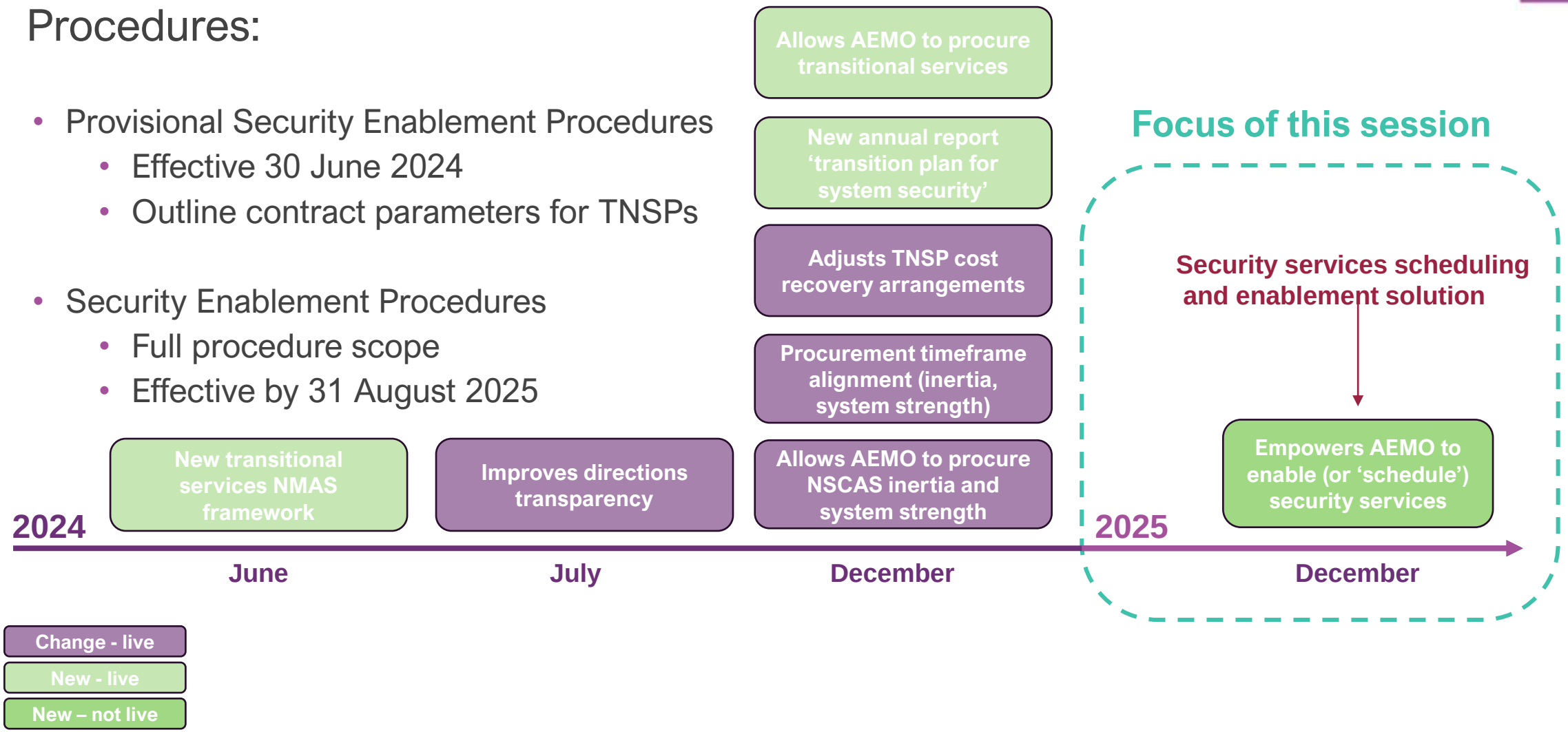
Participants are asked to familiarise themselves with AEMO's Competition Law Meeting Protocol as outlined in Appendix A and at AEMO's website.

2. Context

Key Elements of ISF rule

Procedures:

- Provisional Security Enablement Procedures
  - Effective 30 June 2024
  - Outline contract parameters for TNSPs
- Security Enablement Procedures
  - Full procedure scope
  - Effective by 31 August 2025



3. Implementation Approach

AEMO Approach to Implementation

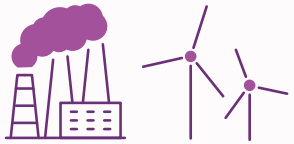
- The timeframes from ISF Rule determination to go live are tight
  - 21 months from final determination to implementation
  - Introduces new concepts and approach to system security services
  - Implementation has significant complexity and challenge

- AEMO has taken an approach that seeks to achieve the following:
  - Automated solution for Dec 2025 to meet ISF Rule
  - Enablement timelines that provide operational transparency to market
  - Manual solution for enablement of services where appropriate
  - Evolution and iteration of the solution to increase complexity moving forward as required
  - Capability for scheduling for the *stable voltage waveform requirement* to be introduced when needed

Participant impacts - Security services scheduling and enablement solution

Who

Service providers



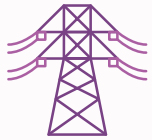
Market Generators
(Scheduled and Semi-Scheduled)

Integrated Resource Providers (IRP)

Market Customers

Other system security service providers

Networks



Transmission Network Service Providers (TNSP)

What

Working with AEMO to schedule services effectively

Align with the Security Enablement Procedure and associated processes

Potential system impacts to receive and respond to enablement instructions

Alignment of settlement processes for the cost recovery of non-market ancillary services and AEMO procured contract settlement

4. Security Enablement Procedures (SEP)

Contents

Sections

- Procedures overview
- Enablement methodology and process
- Stable Voltage Waveform
- Enablement Delegation

Considerations for stakeholders

In relation to what is proposed in the consultation paper and draft Procedures:

- Do you have a view on whether proposed processes and principles are practical and suitable?
- Are there other factors and concepts that AEMO should consider?
- Do you have a view on how AEMO could best strike a balance between operational efficiency, transparency and cost efficiency?

SEP Overview

- A new Security Enablement Procedure is introduced by the ISF Rule

- Outlines how operational requirements of the ISF Rule are met:
  - Establish a minimum system security requirements methodology
    - What is the minimum system security need in the operational timeframe
  - Establish an enablement methodology
    - Meet enablement principles for system security services enablement
  - TNSP system security services agreements
    - Establish minimum requirements and guardrails on contractual parameters
    - Facilitate enablement through AEMO's automated system
  - Stable voltage waveform requirements
    - How AEMO may determine stable voltage waveform requirements to mitigate system strength constraints on IBR output
    - Enablement for stable voltage waveform requirements

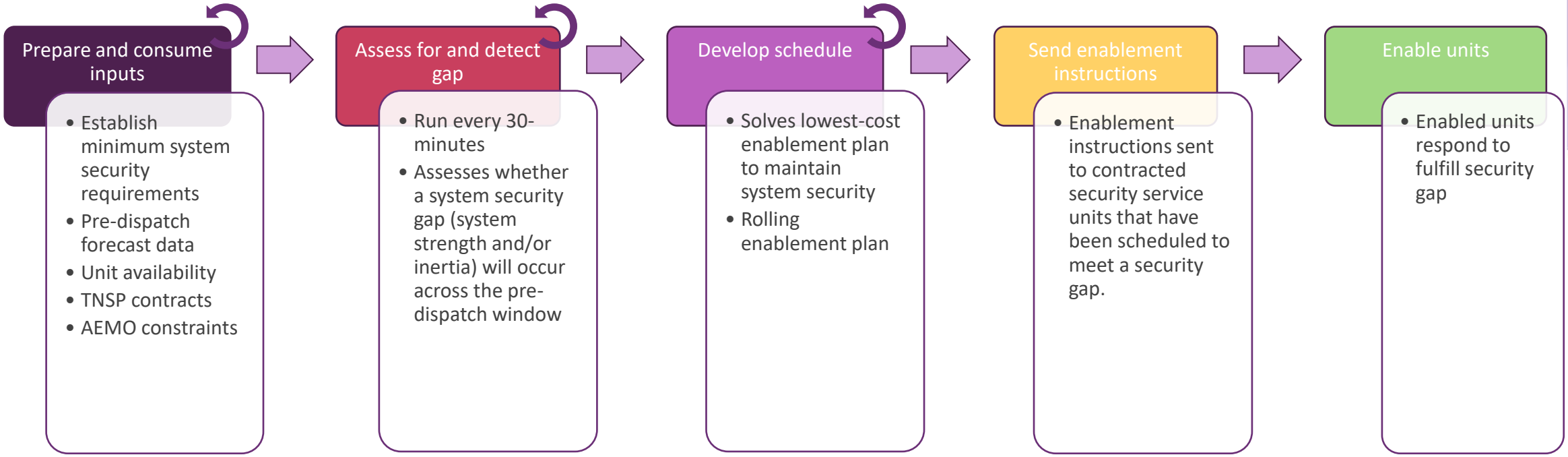
Enablement Methodology and Principles

The system security enablement methodology (NER 4.4A.6):

- How AEMO will enable system security services to meet the minimum operational requirements
- Must meet the following enablement principles:
  - Lowest total cost combination to achieve required outcomes
  - Enabled timing as close as practicable to the requirement and no more than 12 hours ahead
  - Prudent enablement where, in AEMO's reasonable opinion, the service is required to achieve the minimum system security requirements or the stable voltage waveform requirements*
  - When required, enabling system strength services for stable voltage waveform requirements* that avoids significant adverse effects on power system efficiency and power system emissions.

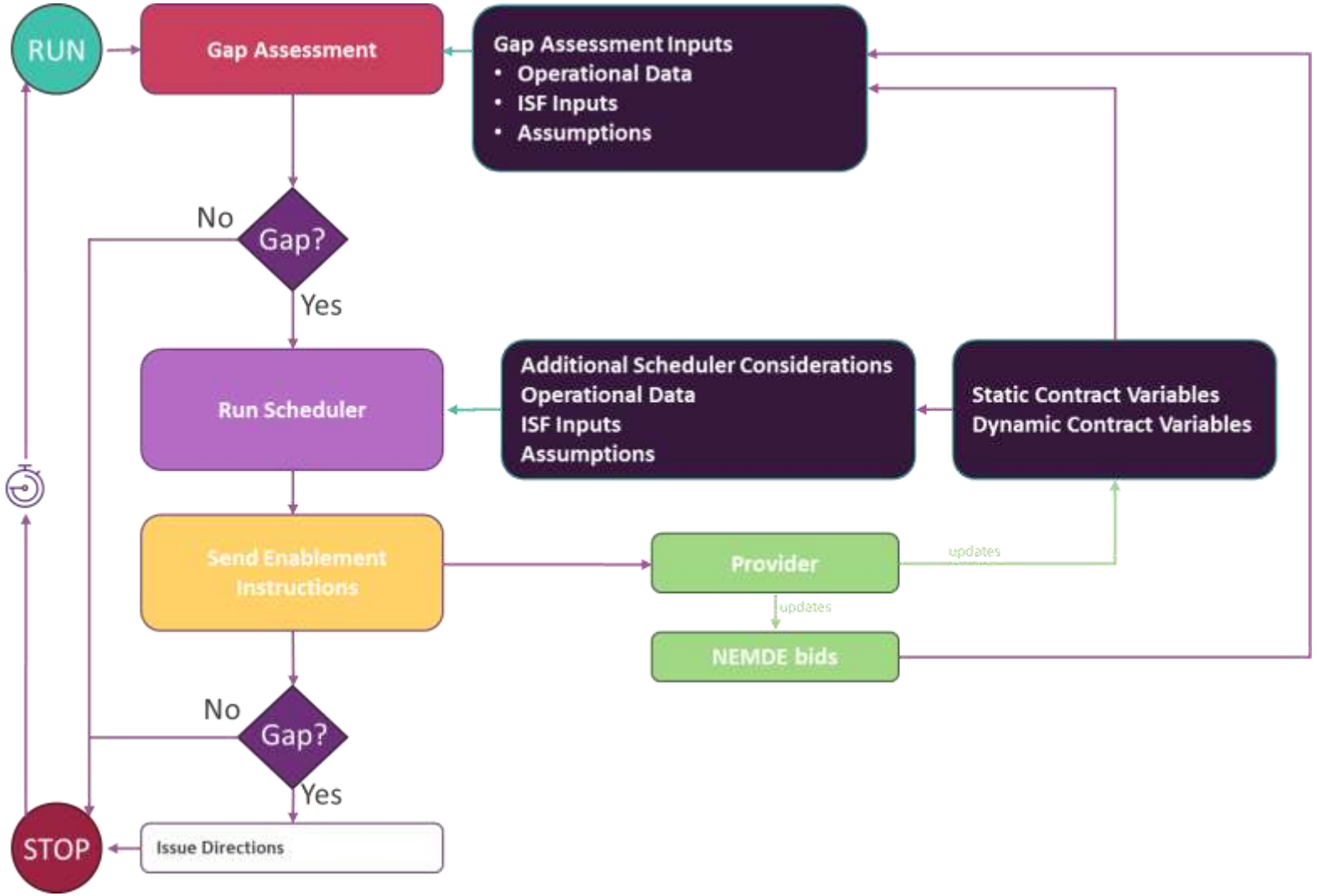
* Expected to be required from July 2026

High-level Overview of Automated Scheduling and Enablement Process

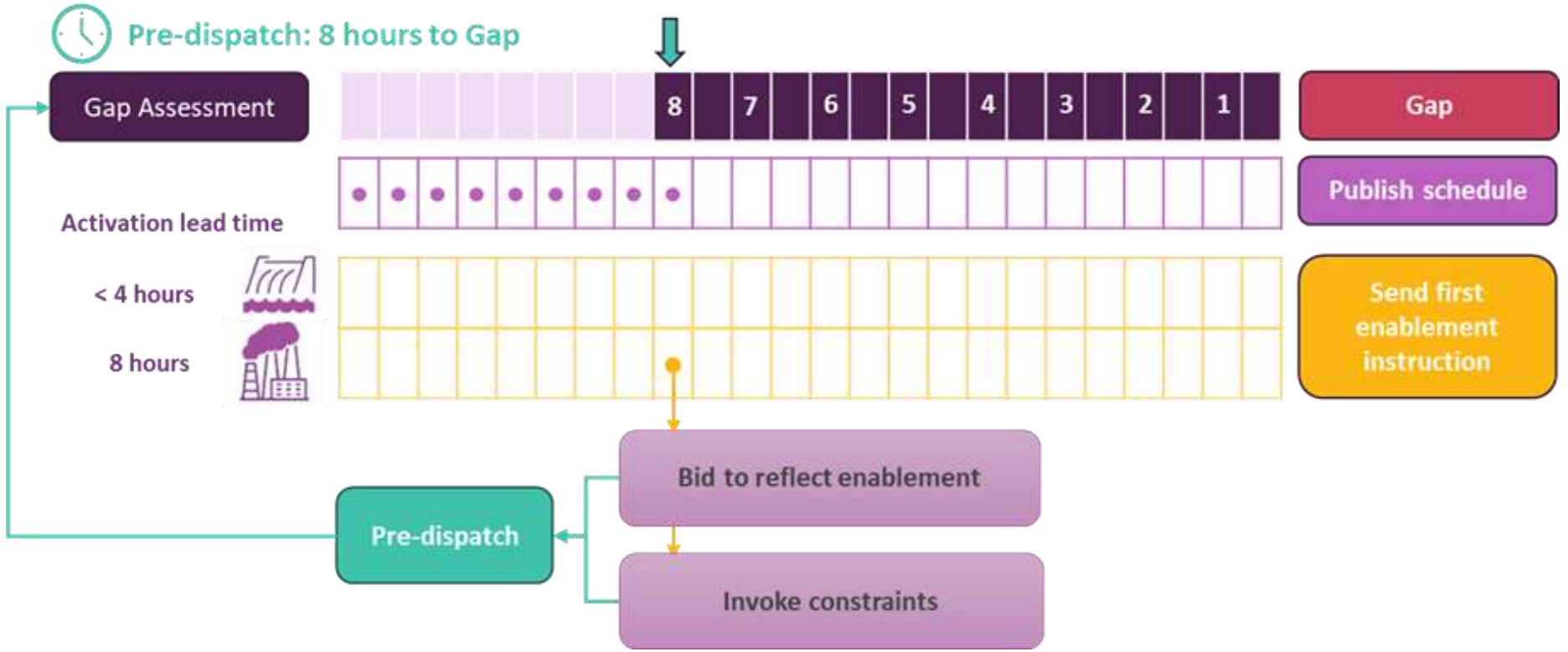


This process provides context to the sections within the Security Enablement Procedure

Overview of Enablement Methodology

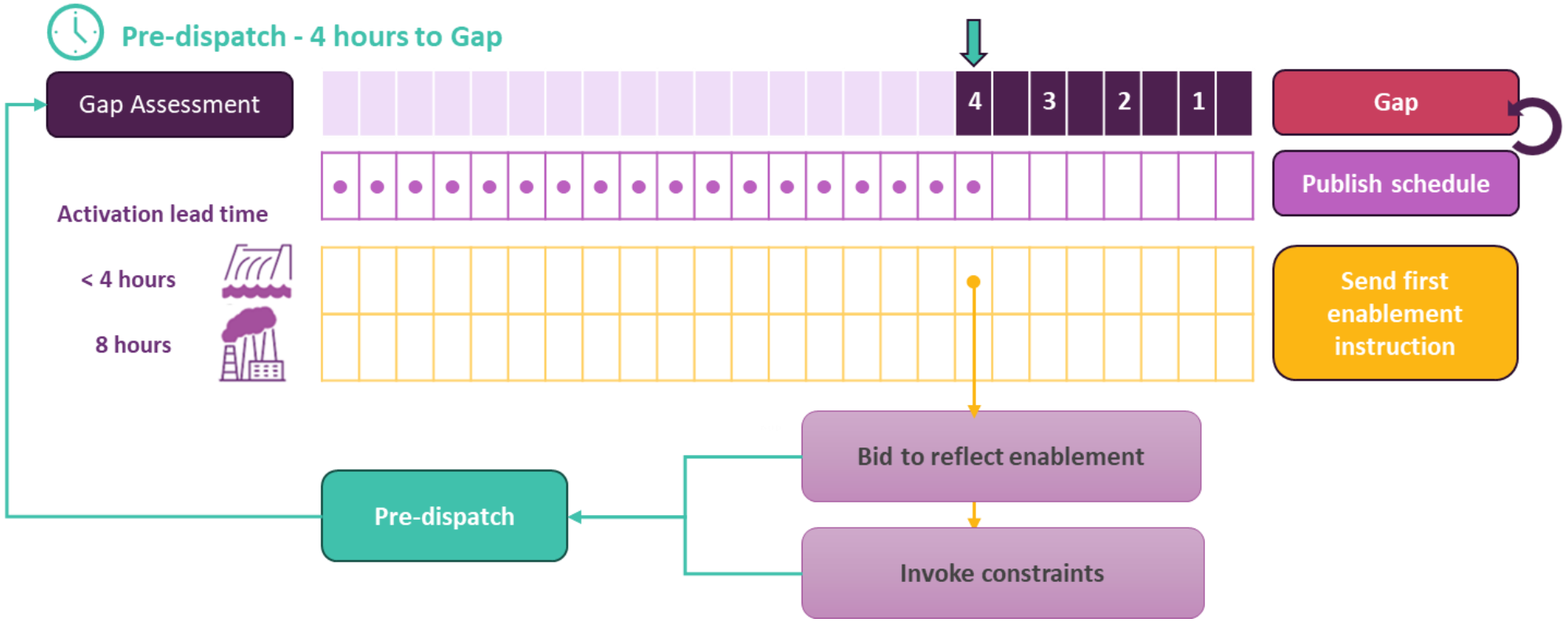


Schedule - Enable - update (1/3)



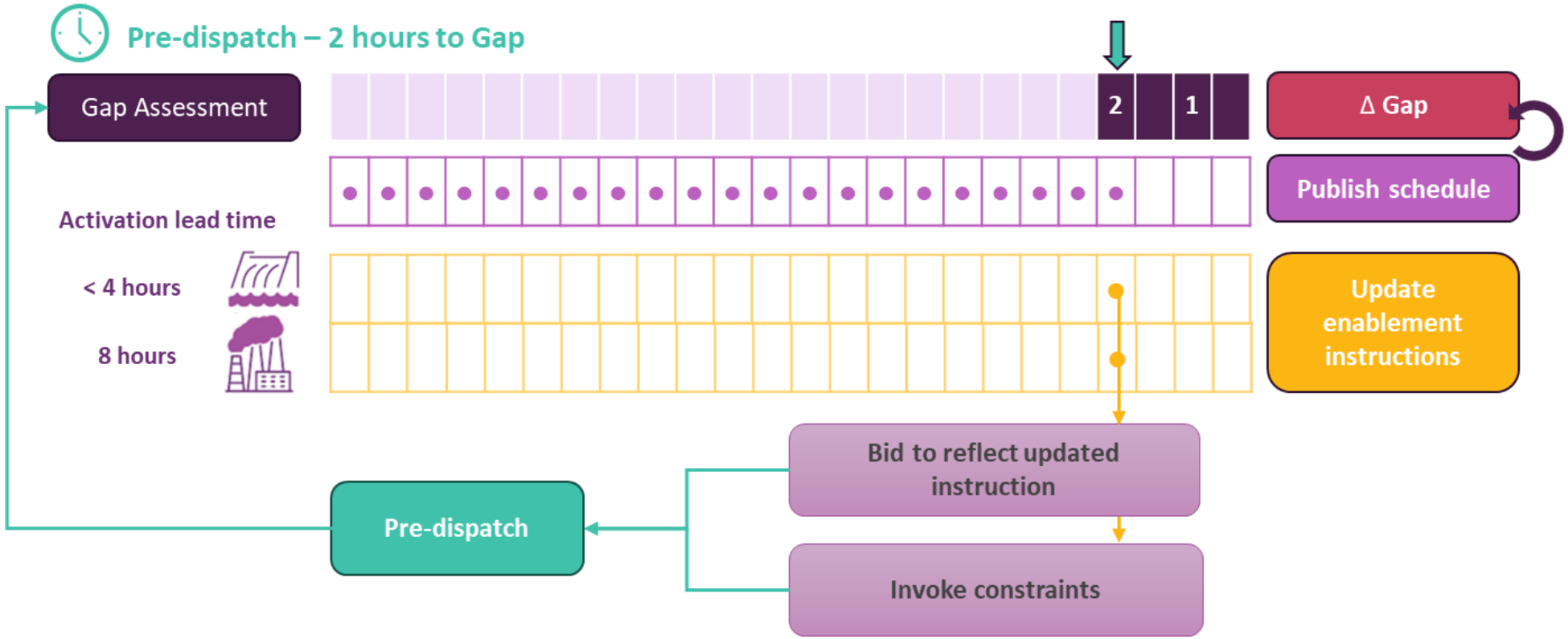
- A gap in 8 hours time requires the services of a thermal asset with an 8-hour lead time
- The thermal plant is enabled 8 hours prior to gap and bids into NEMDE accordingly
- ISF constraints are invoked
- Pre-dispatch reflects intention to dispatch

Schedule - Enable - update (2/3)



- The gap, now in 4 hours time, requires the services of assets with lead times less than 4 hours
- All remaining enablement instructions are issued
- Enabled assets bid into NEMDE accordingly
- ISF constraints are invoked
- Pre-dispatch reflects intention of market scheduled assets to dispatch

Schedule - Enable - update (3/3)



- The gap, now in 2 hours time, has changed in size requiring an update to enablement instructions
- All enablement instructions are issued immediately
- Enabled assets bid into NEMDE accordingly
- ISF constraints are invoked
- Pre-dispatch reflects intention of assets

Minium Security Services Requirement

- The first step in the automated scheduling and enablement solution is to define the security services required in the operational timeframe
- Minimum system security requirements:
  - Operate the power system in a secure operating state
  - Maintain power system security during power system operating conditions encountered in the power system
  - Be able to return to a secure operating state within 30 minutes of a contingency event*
- The requirement is met by adopting AEMO's reports and reflecting operational conditions through constraints

* The December 2025 solution will not consider return to secure operating state except through alarms for operational manual intervention as required

Minium Security Services in Operational Timeframe

Report	Operational Transformation
• **Inertia** Requirements Methodology made under NER 5.20.4 • Annual Inertia Report	Implementation of system security inertia constraints that reflect current system conditions, and which calculate the resulting level of inertia expected to be required in each region to maintain a secure and satisfactory operating state.
• **System Strength** Requirements Methodology made under NER 5.20.6 • Annual System Strength Report	Implementation of a set of constraints that reflect expected system conditions, and which calculate the resulting levels of system strength service expected to be required to maintain a secure operating state. TNSPs will provide AEMO with specific limits advice to inform the development of these constraints, to ensure consistency with the modelling and assumptions used by TNSPs in selecting their suite of system strength service Providers.
• **NSCAS** Description and Quantity Procedures made under NER 5.20.2 • Annual NSCAS Report	Triggers for enablement will reflect the operational conditions under which the NSCAS gap was identified.
• Statement/s of security need for **Transitional Services** (as defined under NER 3.11.11 (b)) published in accordance with the Transitional Services Guideline	Triggers for enablement will be outline in the relevant statement of security need.

Determining a Security Services Gap

- System security services are only required when the minimum operational requirements are not being met; i.e. there is a security services gap
- AEMO will forecast the operational outcomes using pre-dispatch date to establish:
  - minimum operational requirements
  - services online
  - if there is a gap (i.e. **services online < minimum operational requirement**)
- A series of assumptions are required where AEMO does not have full visibility from pre-dispatch information. For example,
  - number of units online in a multi unit DUID
  - status of synchronous condensers and grid forming batteries

Lowest Cost Enablement Solution

AEMO will determine the lowest cost system security services schedule for enablement through assessment of:

- Availability of security service assets to provide a service
- Timing of the forecast gap
- Activation lead times of available security service assets
- Minimum dispatch levels
- Level of inertia or system strength available from security services asset
- Financial parameters (payment types and values):
  - Activation payments ($ per activation)
  - Usage payments ($ per hour of enablement)
  - Energy revenue (minimum dispatch MWh x min [0, pre-dispatch price] $/MWh)
- Operational factors; e.g. avoidance of minimum system load conditions

TNSP Agreements

AEMO must establish minimum/recommended requirements to be included in TNSP system security services agreements under NER 4.4A.6(a)(3):

- General agreement structure
  - Agreements must allow AEMO to individually enable security service assets
  - A security service asset must not encompass more than one DUID
  - A single agreement may cover multiple security service assets
- Defining service provision
  - Fixed parameters
  - Operational parameters
- Financial structure
- Intended scheduling arrangements
  - As outlined in the SEP
- General requirements
  - A Provider must comply with the SEP; e.g. availability and enablement instructions

Operational Parameters

- TNSP contracts must include parameters describing the nature of the service e.g., DUID, MWs
- The following parameters are expected to change in operational timeframe.
- TNSP agreements must cater for update of Provider information to AEMO.

Category	Description
Availability	• Current and forecast availability of the service across the full-time horizon covered by the information system. • This is a binary available or non-available. • Spot market operation is considered available. • Applies to units that provide a service in a DUID. • It may be necessary to use availability reductions to manage operations around commercial conditions, such as the management of stored energy.
Activation lead time	• This may be restated from the default contractual parameters where physical conditions have changed. • Must maintain consistency for units that provide a service in a DUID. • An example is where a generator has recently been operating and can therefore achieve a shorter activation lead time.
Minimum dispatch	• Details of any minimum dispatch. Adjustment will have energy revenue consequences • Adjustment will not impact usage payments. • An example is where poor fuel quality or ambient conditions has temporarily raised the minimum stable boiler flame and resulting generation.

TNSP Agreements: Financial Parameters

- To determine the lowest cost solution for a gap it is necessary to understand the cost of enablement of each service
- An automated solution needs established parameters that apply to enablement of each service
- AEMO's approach to TNSP agreements is:
  - Allow maximum flexibility possible
  - Require the TNSP to provide contractual cost information in the form allowed under SEP
  - Financial values can be approximate values if the contract does not perfectly align with usage, activation and energy revenue parameters

Financial Parameters

Category	Stipulations
Usage payment	The payment, stated on a per hour basis, that the Provider will receive from the TNSP when the service is *enabled*. • Dollars per hour of service operation. • Fixed but may be restated annually (1 intra year revision allowed per year for verifiable reason; i.e. fuel costs). • Not payable during the activation lead time. • Not paid if enablement is discontinued for any reason. • Must be consistent for units that provide a service in a DUID.
Activation payment	Activation payments (if relevant) for a security service asset performing a physical start from a previously inactive state. • Fixed payment in dollars. • Fixed but may be restated annually (1 intra year revision allowed per year for verifiable reason; i.e. fuel costs). • If the instruction is given or schedule is cancelled or amended within the activation period, the full activation payment is payable. • Must be consistent for units that provide a service in a DUID
Energy revenue	Transfer of revenue from the sale of electricity on the *spot market* (negative) resulting from the Provider being *enabled* at minimum *dispatch*. • If non-zero in an agreement, AEMO will adopt (for scheduling purposes) a standardised calculation to represent this payment. AEMO will not consider any other form of transfer in its scheduling process: minimum dispatch MWh x min[0, pre-dispatch price] $/MWh • AEMO assumes the Provider is not paid if Provider moves into commercial operation

The approach to energy revenue has been simplified since publication of the Provisional SEP

Approach to Complexities

- The SEP has been written to afford a level of flexibility in the scheduling and enablement solution to account for AEMO's scheduling solution evolving post December 2025
- The following have provisions in the SEP should a TNSP agreement include them:
  - Minimum run times
  - Modes of operation (e.g. gas GT operating in synchronous condenser mode)
  - Multiple units within a DUID
- AEMO may not explicitly include these operational parameters in the December 2025 implementation, subject to solution development time allowing

System Security Services Enablement

To facilitate the giving of enablement instructions:

- AEMO will issue a schedule indicating an intention to enable over the pre-dispatch horizon
- AEMO may cancel or amend the schedule at any time
- A schedule may be prior to:
  - The intended period of enablement
  - The activation period
- Enablement instructions will be given in the manner specified in the SEP
- Instructions will be provided in 30-minute granularity initially but may be introduced in 5-minute granularity in the future
- Providers must comply with enablement instructions

System Security Services Enablement

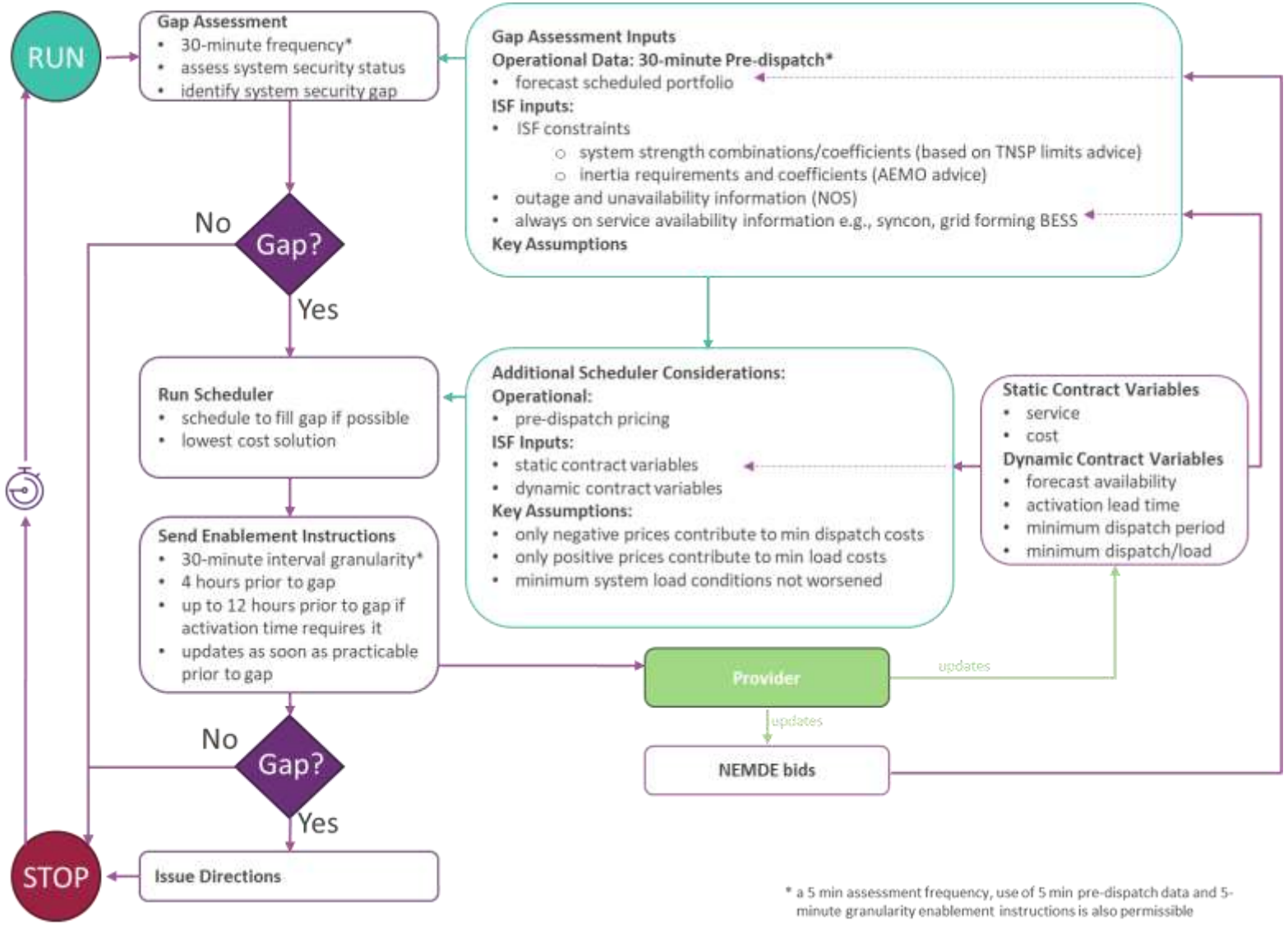
System Security Service enablement guardrails include:

- Instructions issued at the activation lead time or IEI ahead of the identified need, whichever is sooner
- Not enabled greater than 12 hours in advance of the start of an identified need
- Updated enablement instructions issued up to 5 minutes in advance to cancel, amend or update
- If a lower cost schedule is identified, enablement instructions will only be updated where the threshold cost saving is forecast to be achieved

Following issue of an enablement instruction:

- Provider must amend bids to reflect enablement as required
- AEMO will invoke constraints to ensure dispatch of service

Overview of Enablement Methodology



This figure illustrates the overarching process and how all the concepts in the SEP come together in the automated solution

* a 5 min assessment frequency, use of 5 min pre-dispatch data and 5-minute granularity enablement instructions is also permissible

Stable Voltage Waveform

AEMO may, at any time, enable:
system strength services to achieve and maintain stable voltage waveforms for the level and type of inverter based resources and market network service facilities that AEMO forecasts would be dispatched in the relevant trading interval if this were not limited by system strength services (stable voltage waveform requirements)

- AEMO have been engaging with TNSPs to understand when an automated scheduling process is required, to consider enablement of agreements to meet the *stable voltage waveform requirement*
  - Current intent is to deliver this capability from mid-2026 when needed
  - Two relevant factors determining timing:
    - System strength agreements in place that are technically, locationally and contractually appropriate to support IBR dispatch
    - TNSPs reflecting what system strength services can be enabled to meet a need, via limits advice – articulating what system strength services support dispatch of which IBR units
  - AEMO proposes to consult separately on this, given timing considerations.
- In the interim, AEMO plans to address unanticipated circumstances related to meeting the stable voltage waveform requirement on a case-by-case basis.

5. Next steps

Next steps

STAGE	DATES	RESPONSIBLE
Publish consultation paper and draft Security Enablement Procedures	Mon 7 Apr 2025	AEMO
Public forum	Thu 10 Apr 2025	AEMO
Feedback period on consultation paper closes	Thu 8 May 2025	Industry to provide feedback
Draft report published	Expected Fri 6 Jun 2025	AEMO
Feedback period on draft report closes	Expected Tue 8 Jul 2025	Industry to provide feedback
Final report and Procedures published	Expected Mon 4 Aug 2025	AEMO

AEMO invites feedback on the matters for consultation.

- Download consultation paper and draft Security Enablement Procedures: https://aemo.com.au/consultations/current-and-closed-consultations/security-enablement-procedures
- Please provide your feedback via nemreform@aemo.com.au **by 5pm AEST on Thu 8 May 2025**.
- Your feedback is essential, and the consultation paper (and this presentation) outlines key areas for industry to consider.
- Feedback will inform the draft report where appropriate.

Consequential procedure changes from SEP to existing AEMO procedures

Document	Indicative consultation commencement	Impact
SO_OP_3707 - Directions and Clause 4.8.9 Instructions	April 2025	Possible reference to the security service schedule as a consideration before issuing a direction.
Spot Market Operations Timetable	April 2025	To reflect NER 4.4A.7, new information to address AEMO's publication of system security service information from the previous day.
SO_OP_3704 - Pre-Dispatch	April 2025	Pre-dispatch must include the security services enabled in the latest schedule (via constraints or bids). Include this information in the pre-dispatch procedure if required, with reference to the Security Enablement Procedure.
SO_OP_3708 - Non-market Ancillary Services	April 2025	Dispatch instructions for NMAS will be reviewed to consider any specifications that are unique for Transitional Services, where not already addressed within Security Enablement Procedure.
SO_OP_3715 - Power System Security Guidelines	April 2025	Ensure enablement of system security service agreements is included as one of the options for managing secure power system security.
SO_OP_3718 – Outage Assessment	April 2025	Include an explanation that an outage is unlikely to proceed if there are insufficient system security services available.

AEMO plans to finalise these changes in line with the SEP and by 31 August 2025. Updates and reporting on the progress of consultation processes, will be reported via AEMO's Electricity Wholesale Consultative Forum.

How to get involved

Forums	Forum focus	Cadence	Approach
Executive Forum	Program overview and status update	3 per Year	Nomination
Reform Delivery Committee (RDC)	Long term implementation planning perspective	Quarterly	Nomination
Program Consultative Forum (PCF)	Inflight initiatives status & co-ordination	Monthly	Open
Implementation Forum	Implementation of reforms	Monthly	Open
Electricity Wholesale (EWCF) & Electricity Retail (ERCF) Consultative Forums	Procedures working groups	Monthly	Open
Industry Testing Working Group	Testing	Monthly	Open
Working Groups	Inflight	As appropriate	As appropriate

Focus / working groups for inflight initiatives include:

- Initiative working groups e.g. ISF TNSP Working Group
- Market Integration Technology Enhancement WG (IDX/IDAM/PC)
- Industry Testing Working Group (ITWG) – IT technical implementations

To learn more, please visit:

- AEMO | NEM Reform Program Forums
- AEMO | NEM Reform Program Initiatives
- AEMO | Industry Meetings Calendar
- AEMO | ISF Project webpage
- or contact the program at NEMReform@aemo.com.au.

Subscribe to the NEM Reform Newsletter here

6. Q&A

7. Meeting close

Appendix A:
Competition law meeting protocol

AEMO Competition Law - Meeting Protocol

AEMO is committed to complying with all applicable laws, including the Competition and Consumer Act 2010 (CCA). In any dealings with AEMO, all participants agree to adhere to the CCA at all times and to comply with appropriate protocols where required to do so.

AEMO has developed meeting protocols to support compliance with the CCA in working groups and other forums with energy stakeholders. Before attending, participants should confirm the application of the appropriate meeting protocol.

Please visit: https://aemo.com.au/en/consultations/industry-forums-and-working-groups

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