Department of Energy and Economic Diversification
GOVERNMENT OF WESTERN AUSTRALIA

Energy Policy WA

Meeting Agenda

Meeting Title:	Pilbara Advisory Committee (PAC)
Date:	Thursday 28 August 2025
Time:	1:30 PM – 3:30 PM
Location:	Level 1, 66 ST Georges Terrace and Online, via TEAMS

Item	Item	Responsibility	Type	Duration
1	Welcome and Agenda • Conflicts of interest • Competition law statement	Chair	Noting	2 min
2	Meeting Apologies/Attendance	Chair	Noting	1 min
3	Minutes			
	(a) Minutes of Meeting 2025_06_26 Published 6 August 2025	Chair	Noting	2 min
4	Action Items	Chair	Noting	1 min
5	EPNR Project: Discussion on draft Implementation Plan	WG Chair	Discussion	110 min
6	General Business	Chair	Discussion	4 min
	Next meeting: 1:30 PM, 30 October 2025			

Please note, this meeting will be recorded.

Competition and Consumer Law Obligations

Members of the PAC (**Members**) note their obligations under the *Competition and Consumer Act 2010* (**CCA**).

If a Member has a concern regarding the competition law implications of any issue being discussed at any meeting, please bring the matter to the immediate attention of the Chairperson.

Part IV of the CCA (titled "Restrictive Trade Practices") contains several prohibitions (rules) targeting anti-competitive conduct. These include:

(a) **cartel conduct**: cartel conduct is an arrangement or understanding between competitors to fix prices; restrict the supply or acquisition of goods or services by parties to the arrangement; allocate customers or territories; and or rig bids.

(b) **concerted practices**: a concerted practice can be conceived of as involving cooperation between competitors which has the purpose, effect or likely effect of substantially lessening competition, in particular, sharing Competitively Sensitive Information with competitors such as future pricing intentions and this end:

- a concerted practice, according to the ACCC, involves a lower threshold between parties than a contract arrangement or understanding; and accordingly; and
- a forum like the PAC is capable being a place where such cooperation could occur.

(c) **anti-competitive contracts, arrangements understandings**: any contract, arrangement or understanding which has the purpose, effect or likely effect of substantially lessening competition.

(d) **anti-competitive conduct (market power)**: any conduct by a company with market power which has the purpose, effect or likely effect of substantially lessening competition.

(e) **collective boycotts**: where a group of competitors agree not to acquire goods or services from, or not to supply goods or services to, a business with whom the group is negotiating, unless the business accepts the terms and conditions offered by the group.

A contravention of the CCA could result in a significant fine (up to $500,000 for individuals and more than $10 million for companies). Cartel conduct may also result in criminal sanctions, including gaol terms for individuals.

Sensitive Information means and includes:

(a) commercially sensitive information belonging to a Member's organisation or business (in this document such bodies are referred to as an Industry Stakeholder); and

(b) information which, if disclosed, would breach an Industry Stakeholder's obligations of confidence to third parties, be against laws or regulations (including competition laws), would waive legal professional privilege, or cause unreasonable prejudice to the Coordinator of Energy or the State of Western Australia).

Guiding Principle – what not to discuss

In any circumstance in which Industry Stakeholders are or are likely to be in competition with one another a Member must not discuss or exchange with any of the other Members information that is not otherwise in the public domain about commercially sensitive matters, including without limitation the following:

(a) the rates or prices (including any discounts or rebates) for the goods produced or the services produced by the Industry Stakeholders that are paid by or offered to third parties;

(b) the confidential details regarding a customer or supplier of an Industry Stakeholder;

(c) any strategies employed by an Industry Stakeholder to further any business that is or is likely to be in competition with a business of another Industry Stakeholder, (including, without limitation, any strategy related to an Industry Stakeholder's approach to bilateral contracting or bidding in the energy or ancillary/essential system services markets);

(d) the prices paid or offered to be paid (including any aspects of a transaction) by an Industry Stakeholder to acquire goods or services from third parties; and

(e) the confidential particulars of a third party supplier of goods or services to an Industry Stakeholder, including any circumstances in which an Industry Stakeholder has refused to or would refuse to acquire goods or services from a third party supplier or class of third party supplier.

Compliance Procedures for Meetings

If any of the matters listed above is raised for discussion, or information is sought to be exchanged in relation to the matter, the relevant Member must object to the matter being discussed. If, despite the objection, discussion of the relevant matter continues, then the relevant Member should advise the Chairperson and cease participation in the meeting/discussion and the relevant events must be recorded in the minutes for the meeting, including the time at which the relevant Member ceased to participate.

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Agenda Item 4: PAC Action Items

Pilbara Advisory Committee (PAC) Meeting 2025_08_28

Shaded	Shaded action items are actions that have been completed since the last PAC meeting. Updates from last PAC meeting provided for information in RED.
Unshaded	Unshaded action items are still being progressed.

Item	Action	Responsibility	Meeting Arising	Status
4/2025	Update the invitation for the 28 August PAC meeting to "in-person", noting that hybrid facilities would still be available, but encouraging members to attend in person and arrive 10 minutes early to enable members to meet each other.	EPWA	2025_06_26	**Closed**

Note. Closed action items will be removed from this list once noted at a PAC meeting. Accordingly, the numbering of action items may not be sequential.

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Agenda Item 5: Evolution of the Pilbara Networks Rules (EPNR) Project: Discussion on draft Implementation Plan

Pilbara Advisory Committee (PAC) Meeting 2025_08_28

1. Purpose

The purpose of this agenda item is to:

- update the PAC on the draft timing and staging of reform initiatives; and
- discuss these with PAC members.

2. Recommendation

That the PAC:

(1) notes the information provided in the PAC Presentation Slides (**Attachment 1**); and

(2) provide feedback on the draft Implementation Plan.

3. Background

- On 31 July 2025, EPWA held a meeting of the EPNRWG PNR Workstream to consult on the draft Implementation Plan.
- EPWA have prepared amended (where appropriate) versions of all proposals and the Implementation Plan, both of which address stakeholder feedback.
- The purpose of the discussion is to receive feedback from the PAC on those materials, to assist EPWA to finalise the development of a Consultation Paper on the Implementation Plan.

4. Next Steps

- The Consultation Paper on the Implementation Plan will likely be published in September 2025.
- The next PAC meeting will be held on 30 October 2025 and will likely discuss stakeholder responses to the Consultation Paper on the Implementation Plan.
- A draft Information Paper on the Implementation Plan will likely be presented to members at the following PAC meeting on 4 December 2025.
- The Information Paper on the Implementation Plan is expected to be published in December 2025.

5. Attachments

(1) 28 August 2025 PAC Presentation Slides

Government of **Western Australia**
Energy Policy WA

Pilbara Advisory Committee

EPNR Project: Implementation plan

28 August 2025

Working together for a **brighter** energy future.

Contents

1. EPNR review to date

EPNR activity to date

Pilbara Industry Roundtable established August 2022. Roundtable communique published August 2023, including high level regulatory considerations, to be followed up by a review of the evolution of the Pilbara Networks Rules, to be delivered in four stages.

Project Delivery	Timeframes
Stage 1: Establish the Working Group	February 2024
Stage 2: Scenario development and modelling	March – July 2024
Stage 3: Assessment of PNR	July – December 2024
Public Consultation	January – April 2025
Stage 4: Implementation Plan	May – September 2025

The PAC has met seven times: 29 February, 18 April, 20 June, 29 August, 5 December 2024, 29 May, 26 June 2025

The EPNR working group has met nine times: 28 March, 15 April, 23 May, 27 June, 29 July, 22 August, 24 October, 21 November 2024, 31 July 2025

The HTR working group has met seven times: 9 May, 11 July, 28 August, 10 October, 14 November 2024, 10 July, 7 August 2025.

19 submissions were received on the consultation paper.

Purpose of this session

This presentation presents the draft implementation plan for the evolution of the Pilbara Networks Rules. It incorporates feedback from the PNR working group, which is summarised on slide 26.

This session is an opportunity for PAC members to provide additional comments on the proposed implementation plan.

2. Phasing and dependencies

Phasing the implementation plan

Some policy outcomes are ready to be implemented now – all that is needed is a rule change.

Some initiatives need further design work before they can be implemented.

Some initiatives are dependent on others, which must be delivered first.

Some outcomes are not needed until power system characteristics change (see next slide).

Prudence and bandwidth considerations mean that not everything can be implemented at once.

In developing the timing and order of implementation, EPWA has considered the three limbs of the State Electricity Objective – whether and when the initiative is needed:

1) to maintain power system security and reliability
2) to enable emissions reduction
3) to enable efficient costs.

Trigger points for introducing change

2024 modelling showed that greater shared use of the Pilbara supply fleet will allow significant cost savings as the volatility of the fleet increases. However, current capacity, trading, and balancing arrangements will suffice until the characteristics of the fleet change. For example, as long as the fleet is almost all dispatchable thermal generation, self-certification of capacity will continue to provide sufficient confidence of available supply.

The current best estimate is that there will definitely be a large influx of renewable generation when new transmission is connected in around 2031, but significant load growth before then could also see higher levels of renewable penetration reached ahead of transmission commissioning.

Modelling shows that there are clear benefits of capacity sharing once renewable generation makes up around 20% of generation. This could happen by 2030, and will almost certainly happen by 2035. See appendix for extracts from 2024 modelling.

By that time, mechanisms to allow sharing of energy must be in place. Some measures need to be in place ahead of this time, and should be staged to allow phased implementation rather than all changes occurring at once.

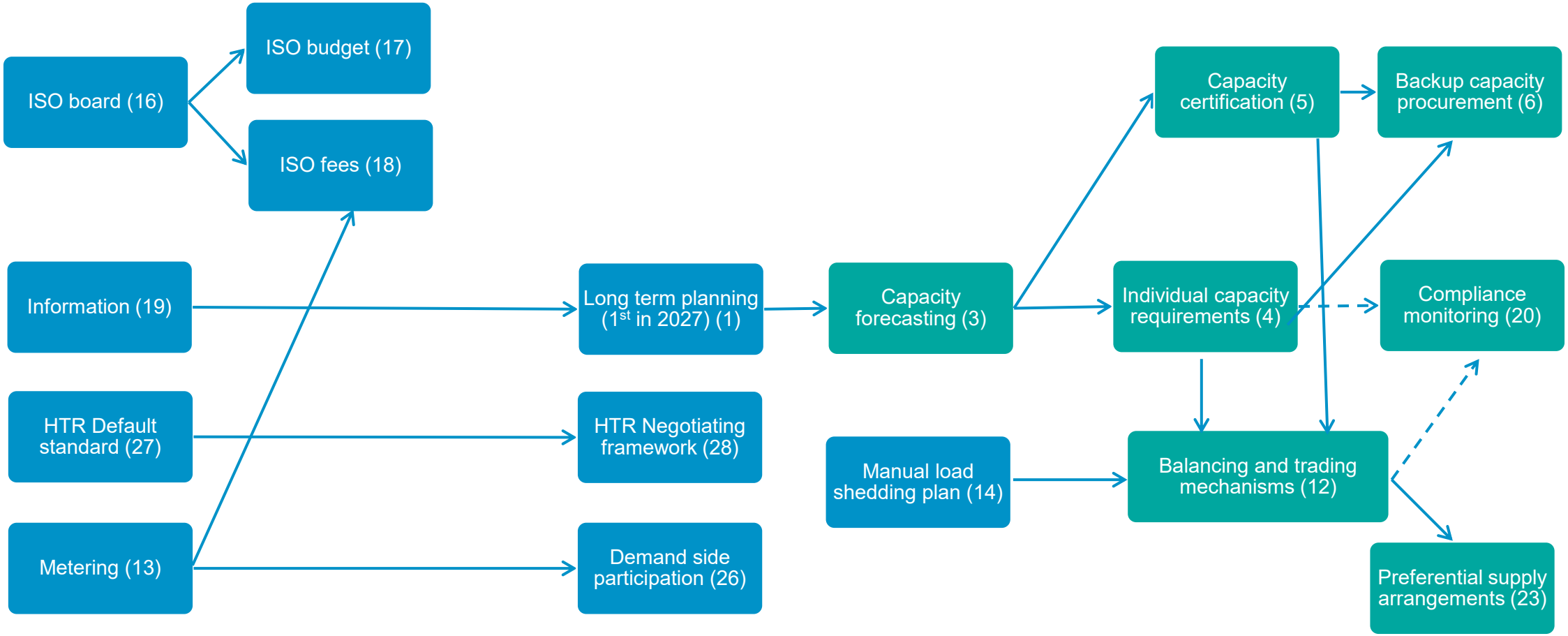
Implementation plan – readiness triggers

- Contingency Reserve Lower service (7): When credible load loss risk exceeds available droop response
- Capacity forecasting (3): When NWIS reaches 10% renewable energy (expected ~2028)
- Two years (~2030) after first capacity forecasts:
  - individual capacity requirements (4)
  - capacity certification (5)
  - additional compliance monitoring (20)
- Demand side participation (26): When NWIS reaches 100MW of flexible load (expected ~2031)
- Backup capacity procurement (6): When NWIS reaches 20% renewable energy and 10% of load served by non-vertically integrated parties (expected between 2031 and 2035)
- New balancing and trading mechanisms (12): When NWIS reaches 20% renewable energy (expected between 2031 and 2035)

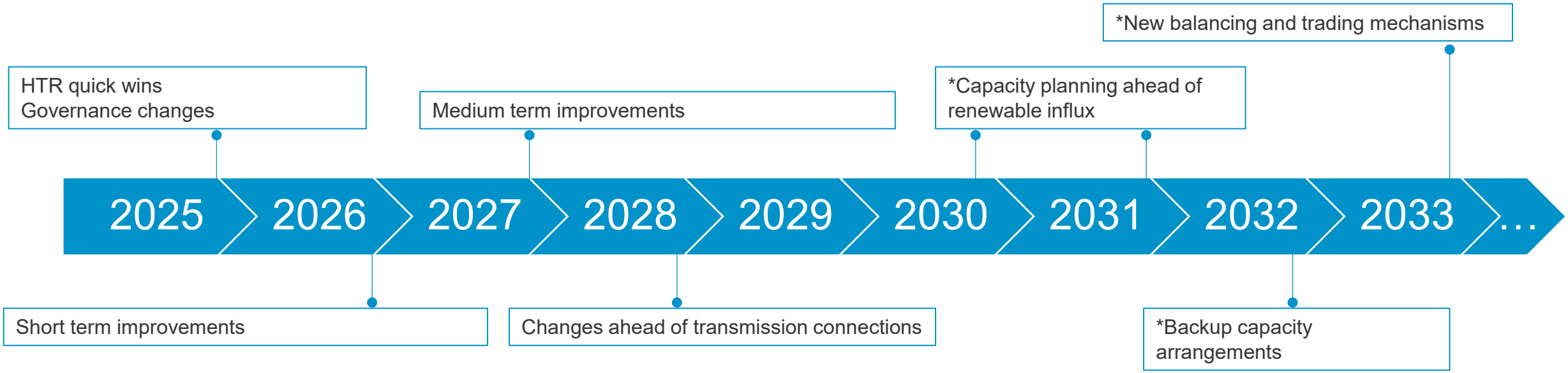
Dependencies

Not dependent on renewable penetration

Dependent on renewable penetration



Implementation plan – high level phasing



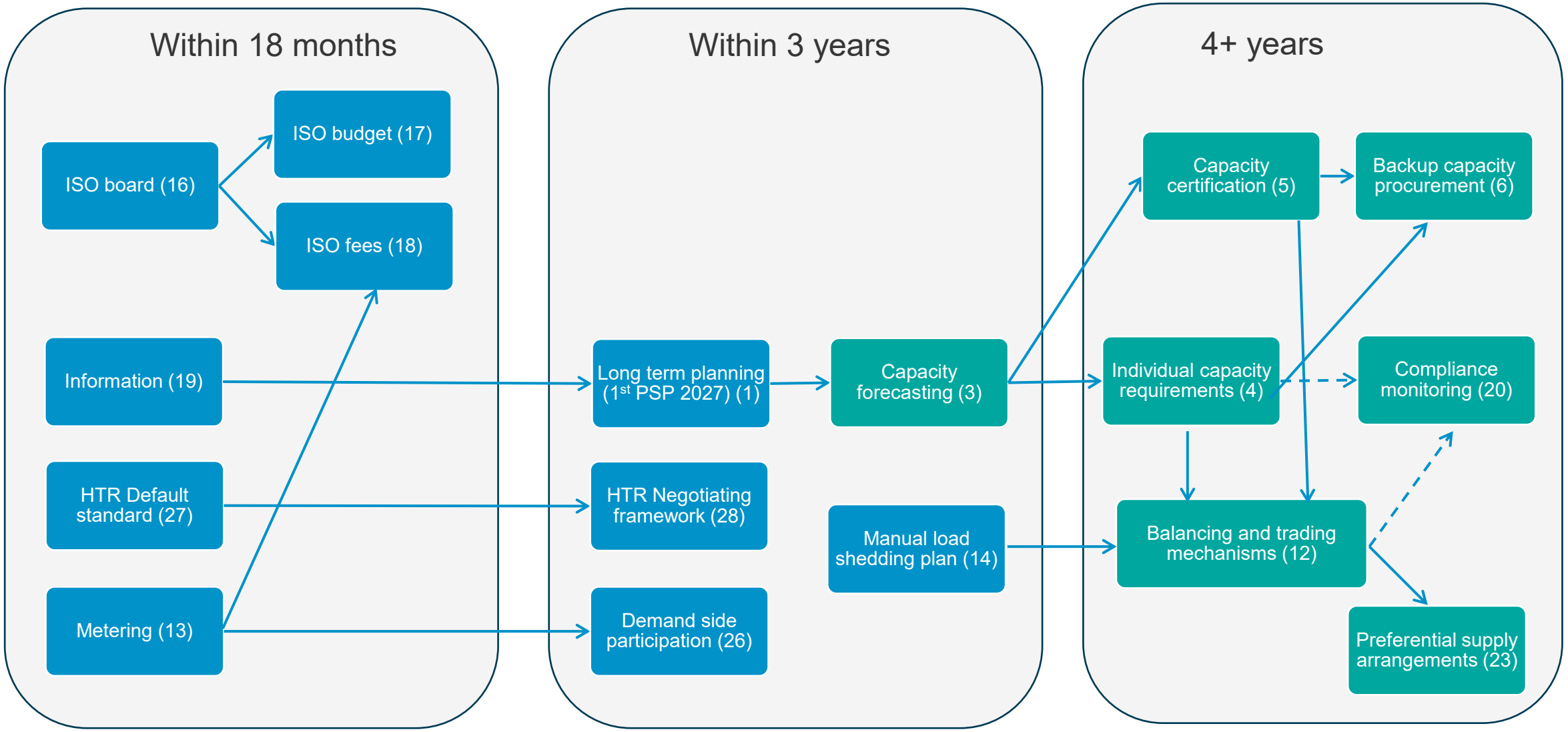
Do PAC members support the approach to staging implementation activities?

* Timing dependent on renewable penetration

Dependencies – timing

Not dependent on renewable penetration

Dependent on renewable penetration



3. Implementation timeline – by proposal

Implementation activities – proposals 1-8

	Proposal	Trigger	Expected timing	Actions needed	Precedents	Dependants
1	Long term planning	N/A	Rule change 2026, First PSP 2027	Rule change	Information (19)	Capacity (3,4,5,6)
2	Network reliability standard	N/A	Within 12-18 months	Develop interpretation guidance, rule change	None	None
3	Capacity forecasting	NWIS reaches 10% renewable energy	2028	Detailed design, rule change	Long term planning (1)	Other capacity activities (4, 5, 6)
4	Individual capacity requirements	N/A	2030 (2 years after capacity forecasts)	Detailed design, rule change	Capacity forecasting (3)	Backup capacity procurement (6)
5	Capacity certification					
6	Backup capacity procurement	NWIS reaches 20% renewable energy and 10% of load served to non-vertically integrated parties	2032	Detailed design, rule change	Capacity requirements and certification (4, 5)	None
7	ESS Framework	Contingency reserve lower: credible risk of load across event greater than available droop response	CRL as per trigger, others 12-18 months	RoCoF studies, rule change	None	None
8	ESS Cost recovery	N/A	CRR – 12 to 18 months Regulation 12-24 months	CRR – Rule change Regulation – Detailed design, Rule change	None	None

Implementation activities – proposals 9-14

	Proposal	Trigger	Expected timing	Actions needed	Precedents	Dependants
9	System strength	N/A	12-24 months	Develop fault level requirements HTR Rule change	None	None
10	Outage planning	N/A	Next 12 months	Develop processes including risk framework Develop criteria for the outage equipment list Develop procedure to help participants identify outage impacts Rule change	None	None
11	Outage planning timing					
12	Balancing mechanism	NWIS reaches 20% renewable energy	2032/33	Detailed design, rule change	Individual capacity requirements and capacity certification (4,5)	Preferential supply arrangements for transmission foundation customers (23)
13	Metering	N/A	12-18 months	Rule change	None	Demand side participation (26)
14	Manual load shedding	N/A	Within 36 months	Rule change, develop load shedding list	None	Balancing mechanism (12)

Implementation activities – proposals 15-23

	Proposal	Trigger	Expected timing	Actions needed	Precedents	Dependants
15	ISO functions	None	2027	Develop project plan to bring control desk in-house Rule change	None	None
16	ISO Board	None	Within 6-12 months	Announce policy requirements for entity appointed to Pilbara ISO role, with transitional timeframe provided for conformity/compliance	None	ISO budget and fees (17,18)
17	ISO Budget	None	Within 6-12 months	Rule change	ISO board (16)	None
18	ISO Fees	None	Within 12-18 months	Detailed design (including data sources), rule change	ISO board (16), Metering (13)	None
19	Information	None	Within 6-18 months	Detailed design, rule change	None	Long term planning (1)
20	Compliance monitoring	Commencement of new capacity or balancing obligations	2031	Rule change	At least one of capacity requirement and certification (4,5), Balancing mechanism (12)	None
21	Compliance enforcement	None	Within 12-36 months	Detailed design, rule change	None	None
22	NSP to NSP connections	Potential for new interconnections (already met)	Within 12-24 months	Rule change, develop procedure	None	None
23	Preferential supply for foundation customers	N/A	36+ months	Detailed design, rule change	Balancing mechanism (12)	None

Implementation activities – proposals 24-28

	Proposal	Trigger	Expected timing	Actions needed	Precedents	Dependents
24	Self contained networks	N/A	Within 24 months	Initial rule change to remove requirement for CPC facilities to be non-compliant with HTR Detailed design Rule change	None	None
25	Storage participation	N/A	Within 6-24 months	Rule change (introduce Energy Producing System) Rule change (technical requirements in HTR chapter 3)	None	None
26	Demand side participation	Approx 100 MW flexible load connects to NWIS	2031	High level design (amend balancing and ESS framework design to allow participation) Rule change	Metering (13)	None
27	HTR standards	None	Default standard within 12 months, minimum standard within 36-60 months	Implement HTR working group actions to complete default standard Develop minimum standard	None	None
28	HTR negotiation framework	None	Within 12-24 months	Detailed design Rule change	HTR default standard (27)	None

5. Implementation plan – by year

Implementation plan – calendar year 2025

Design activity

- Finalise updated ISO governance, including board composition, nomination & appointment process (16)
- Start detailed design for Regulation cost recovery (8)
- Start developing interpretation guidance for network reliability standard (2)
- Start developing outage planning processes (10, 11)
- Develop plan to transfer control desk functions into ISO (15)
- Start detailed design for ISO fee model (18)

Rule changes

- Introduce majority independent ISO board (16)
- Implement 27 of 31 HTR working group actions to complete HTR default standard

Implementation plan – calendar year 2026

Design activity

- Detailed design for monitoring and compliance enforcement tools (21)
- Detailed design for new information framework (19)
- Detailed design for NSP to NSP connection arrangements (22)
- Develop targeted technical requirements for storage facilities (25)
- Detailed design for CPC for self-contained networks (24)

Rule changes (Q1/2)

- Head of power for PSP (1)
- Introduce Energy Producing System (25)
- Remove condition that facilities are only eligible for CPC if they otherwise cannot comply with HTR (24)
- Move metering requirements into PNR (13)

Rule changes (Q3/4)

- Commence new ISO budget arrangements (17)
- Commence new outage planning process (10,11)
- Commence new information framework (19)
- Commence new monitoring and compliance enforcement tools (21)
- Commence new ISO fee model (18)
- Commence new network reliability standard (2)
- Commence specific HTR requirements for storage facilities (25)
- Commence new Regulation cost recovery arrangements (8)

Implementation plan – calendar years 2027-28

Design activity

- Develop fault level requirements (9)
- Detailed design for HTR negotiation framework (28)
- Conduct RoCoF studies to understand ride-through needs (7)
- Develop load shedding list (14)
- Start developing HTR minimum standard (27)
- Detailed design for capacity forecasting (3)

Rule changes 2027

- ISO commences control desk functions (15)
- Commence new system strength approach (9)
- Commence NSP to NSP connection arrangements (22)
- Commence HTR negotiation framework (28)
- Commence CPC for self-contained networks (24)

Rule changes 2028

- Commence manual load shedding plan (14)
- Commence HTR minimum standard (27)
- Commence capacity forecasting (3)
- Introduce contingency reserve lower service (7)

Implementation plan – calendar years 2029-30

Design activity

- Detailed design for individual capacity requirements (4)
- Detailed design for capacity certification (5)
- High level design for demand side participation (26)
- Detailed design for backup capacity procurement (6)
- Detailed design for balancing mechanism (12)
- Detailed design for trading mechanism (12)
- Detailed design for foundation customer preferential supply (23)

Rule changes (2030)

- Individual capacity requirements assessed (4)
- First capacity certification (5)

Implementation plan – calendar years 2029-30

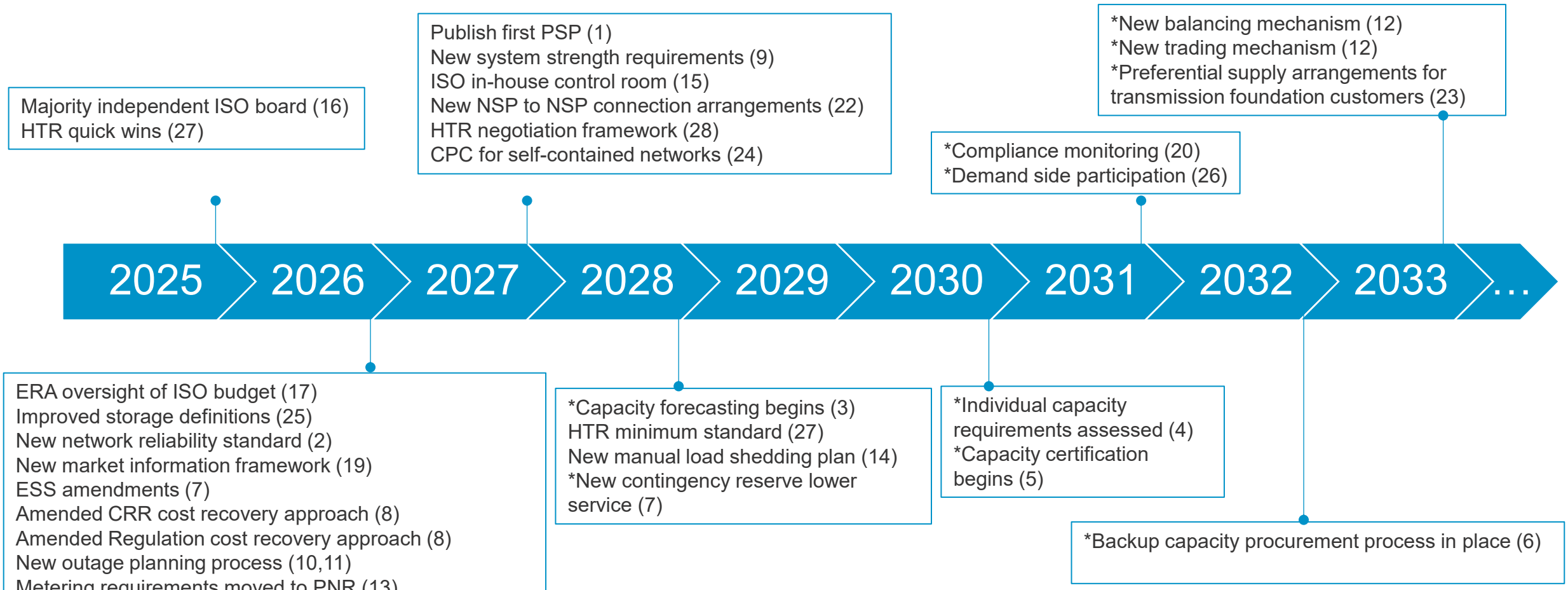
Rule changes 2031-32

- Commence additional compliance monitoring (20)
- Commence demand side participation (26)
- Backup capacity procurement in place (6)

Rule changes 2033+

- New balancing mechanism (12)
- New trading mechanism (12)
- Preferential supply arrangements for transmission foundation customers (23)

EPNR implementation timeline



Do PAC members have comments on initiative timings?

4. Working group feedback

Working group discussion

Working group members requested that certain activities are considered early:

- Information framework (proposal 19), with focus on confidentiality and publication for long term planning (1)
- Metering (13), as may be needed for new market fee model (18)
- NSP to NSP interconnections (22), as these processes could impact on final investment decisions / Priority Corridor Agreements
- New self-contained network construct (24)

Do PAC members agree?

Working group members asked:

- Whether the transmission investment process could benefit from early guidance on preferential supply for transmission foundation customers (23)
- Whether transmission investment should be a reform trigger in addition to variable renewable energy penetration (3, 4, 5, 6, 12, 20, 23, 26).
- Whether the renewables trigger would be based on forecasts, committed projects, or actual output.

The group also discussed:

- Whether there should be a role for EPWA in high-level long-term planning (1), parallel to the WEM WOSP
    - EPWA considers that the ISO's Pilbara System Plan should be limited to demand forecasts and committed projects and produced at least every two years. The broader system plan for the development of the NWIS and priority projects (akin to the WOSP) should by the responsibility of the Coordinator and produced at least once every five years.
- Treatment of ESS providers in balancing settlement. EPWA undertook to include this in the draft rule change package.

Do PAC members have any other comments on triggers or dependencies?

2. Project timeline and next steps

Project timeline

- September: Publish Consultation Paper on Implementation Plan
- 30 October: PAC meeting – Responses to submissions on Implementation Plan
- 4 December: PAC meeting – Draft Information Paper
- December: Publish Information Paper on Implementation Plan

We're working for Western Australia.

Appendix A: Draft policy outcomes for implementation

1. Long term planning

Outcome:

- The ISO will have effective information-gathering powers for all networks in the Pilbara, whether connected to the NWIS or not. Requested information will relate to plans to connect to the NWIS during the planning horizon.
- Every two years, the ISO will prepare a Pilbara System Plan (PSP) for the NWIS, limited to demand forecasts and committed projects.
- At least once every five years, the Coordinator will prepare an integrated system plan for the NWIS, akin to the Whole of System Plan in the WEM, which considers the potential development of the NWIS and priority projects.
- The ISO and Coordinator will consult on the assumptions and methodologies to be used in preparing the system plans.
- Input and output data for the system plans will be published for transparency with commercial sensitivity respected.
- In years where an updated PSP is not published, the ISO will prepare a Generation Statement of Opportunities including updated demand and capacity forecasts, and taking into account network constraints.

2. Network reliability standard

The future success of the Pilbara would be impaired if a network operator is only required to take steps to provide reliable supply after a connecting party requests it. An n-1 reliability planning standard for all new network infrastructure is therefore necessary, but this can be achieved with physical equipment or non-network solutions, including agreements with loads or generators.

Some existing infrastructure was not designed and built to n-1 standard. This infrastructure will not be required to upgrade, either by new network build or new non-network solutions, but will be required to formalise its arrangements for the level of service with existing connected parties if this is not already the case.

Outcome:

- The default reliability planning standard for the NWIS transmission network will be n-1.
- This does not require redundant network equipment, but can be achieved by non-network solutions. For example, load runback schemes / non-firm agreements and generator redundancy/curtailment.
- The standard will not apply to self-contained networks, as long as outages do not affect the rest of the power system.

3. Capacity forecasting

Outcome:

- Capacity forecasting is not required yet, but needs to be in place ahead of a pre-defined percentage of variable renewables.
- The ISO will forecast capacity requirements for the NWIS, based on the capacity needed to avoid unserved energy:
  - in the worst case of coincidence of high demand and low renewable output expected to occur once in ten years (this may not be the same as peak demand); and
  - while maintaining a reserve margin equal to the expected generator forced outage rate.

4. Individual capacity requirements

Outcome:

- Individual capacity requirements are not required yet, but need to be in place ahead of a pre-defined percentage of variable renewables.
- The ISO will set the method for participants to calculate their required contribution to the capacity requirement.
- Participants can nominate part of their demand as non-firm, to be excluded from the firm capacity requirement.
- Participants do not have to account for consumption served by co-located generation.
- Participants will be required to have sufficient capacity to meet their capacity requirement.
- The final NWIS capacity target will be the sum of individual participant requirements.

5. Capacity Certification

Outcome:

- Capacity certification is not required yet, but needs to be in place ahead of a pre-defined percentage of variable renewables.
- A participant can self-certify the capacity contribution of its own facilities if:
  - energy from the facility will be used to serve its own consumption, and
  - this supply will not be affected by network constraints.
- If a participant does not include consumption served by co-located generation in its capacity target, the co-located facilities cannot have a certified capacity contribution.
- The ISO will certify all other capacity:
  - Firm generation will be certified according to maximum output under peak demand conditions, supported by test results.
  - Variable generation will be certified by a probabilistic method that accounts for the variability and the correlation with other variable generation.
  - Storage will be certified by linear deration, and detailed design will consider the need to show proof of energy supply.
- All capacity methods will be transparent, with as much data as possible provided to participants and publicly so affected parties can check the ISO's assessment.

6. Backup capacity procurement

Outcome:

- Backup capacity procurement is not required yet, but needs to be in place when there is a pre-defined proportion of load served by non-vertically integrated parties.
- If there is a shortfall of capacity (i.e. participants do not present evidence of sufficient capacity to meet their individual requirements for a particular year, including a reserve margin), and do not identify their load as non-firm, the ISO will seek to procure additional capacity to meet the shortfall in that year.
- ISO procurement will be capped at a cost reflecting the expected value of customer reliability (VCR) from avoiding the shortfall, to be determined in consultation with stakeholders. This means backup capacity is likely to come from spare capacity from other connected parties or temporary demand response rather than new build.
- The costs of capacity procured by the ISO will be allocated to the participants with individual shortfalls. Self-sufficient participants will not bear any costs of backup capacity procurement.

7. ESS framework

- The two existing essential system services (ESS) will be retained.
- The existing “FCESS” service will be renamed “Regulation.”
- The existing “SRESS” service will be renamed “Contingency Reserve Raise”.
- When there is credible risk of load loss that cannot be absorbed by available droop response, a new Contingency Reserve Lower service will be introduced to manage unplanned loss of load.
- Power system security will be managed by defined ESS requirements rather than by a minimum synchronous generation requirement.
- Power system studies will be conducted to assess Rate of Change of Frequency (RoCoF) ride-through capability of generators and other connected equipment, to determine the need for additional services such as inertia.
- The ISO will move to dynamic ESS requirements, with the ability to set different requirements at different times of day, different times of year and for different system conditions.
- The ISO may set locational ESS requirements for pre- and post-contingency management of the power system, with payment mechanisms aligned with system-wide arrangements.
- The ISO will establish an ESS accreditation framework, and monitor compliance with standards for ESS provision.
- ESS will continue to be procured and provided under contracts, i.e., not through a dynamic market mechanism.

8. ESS cost recovery

Outcome:

- ESS costs will be recovered from causers where practical, on a trading interval basis.
- Regulation costs will be allocated to participants who vary their generation or load from their balancing positions.
- Contingency reserve raise costs will be allocated to supply facilities based on their output in each interval, according to the runway method.
- Contingency reserve raise costs will be allocated to supply facilities based on their output in each interval, according to the runway method.
- Contingency reserve lower costs will be allocated to a load based on their demand in each interval, according to the runway method.
- Facilities will be exempt from Contingency Reserve Raise costs if they provide evidence that a facility trip would be automatically offset by load curtailment by the same participant.

9. System Strength

Outcome:

- The HTR will provide guidance on the setting of the minimum and maximum fault levels on the NWIS.
- The ISO will approve system strength requirements for different parts of the network.
- NSPs will support the ISO to determine the system strength requirements for locations on their networks.

10. Outage planning

Outcome:

- The ISO will manage a centralised outage scheduling process.
- The ISO cannot approve or reject outages of equipment, only the timing of the outage.
- All registered facilities on an outage planning list will be required to participate.
- The outage planning list will contain the facilities for which outages have the potential to materially impact PSSR.
- Outages of facilities not on the outage planning list may be required to be notified to the ISO for information purposes only.
- Outage requestors must consult with affected parties before submitting outage requests to the ISO.
- If a network outage would affect PSSR the network operator must include a plan to mitigate the PSSR impact.
- The ISO must assess outages according to an assessment framework developed with connected parties, and must approve an outage window unless doing so would have a material impact on PSSR.
- ISO decisions (including decisions to include equipment on the outage planning list) can be disputed.

11. Outage plan - timing

Outcome

- Outage plans must be submitted as soon as practicable, and for regular maintenance, no later than a year in advance.
- The ISO must assess outage plans and approve or reject timing within two weeks of receipt.
- If the ISO rejects proposed outage timing, it must assist the proposer to identify an acceptable alternative time.
- Outage plans may be updated after submission, as long as the outage window is maintained. To extend the outage window a new submission must be made.
- The ISO can only withdraw approval for a previously approved outage plan if there is a risk to power system security or reliability, and must inform the requestor as soon as practicable.
- If the ISO withdraws approval within a week of the scheduled start time or recalls an outage, the requestor can request compensation for costs incurred in relation to the cancellation or recall

12. Balancing mechanism

Outcome:

- More sophisticated balancing arrangements are not required yet, but need to be in place ahead of a pre-defined percentage of variable renewables.
- A separate trading mechanism will only be needed if operational generation scheduling continues to need significant lead time for most participants.
- In the meantime, the ISO will continue to balance the system using ESS.
- Settlement arrangements for ESS will be reviewed to ensure that the full cost of ESS is reflected in ESS payments, rather than through exemption from energy payments.

13. Metering

Outcome:

- Content and timing requirements for meter data submissions will be moved from the Energy Balancing and Settlement Procedure to the PNR.
- Meter data format specifications will remain in the Energy Balancing and Settlement Procedure.

14. Manual load shedding plan

Outcome:

- A manual load shedding plan is not required at the moment, but needs to be in place ahead of a pre-defined percentage of variable renewables.
- Participants must use best endeavours to manage their portfolios to balance their consumption and supply according to the trading and balancing mechanism provisions.
- The ISO must seek to maintain the power system in a secure operating state at all times, including using powers of direction to avoid involuntary load shedding.
- If the ISO forecasts a real-time supply shortfall, it must notify participants of the forecast time of the shortfall, and the quantity of expected unserved load.
- The ISO must develop a manual load shedding priority list, identifying the order in which network elements and load will be disconnected in the case of a forecast energy shortfall.
- If load shedding is required, the ISO must endeavour to follow the load shedding priority list.

14. Manual load shedding plan

Outcome (continued):

- In preparing the priority list, the ISO must:
  - If possible, ensure that consumption relating to contracted energy volumes and contracted capacity volumes is disconnected later than consumption not associated with contracted capacity.
  - Ensure that consumption by foundation users of transmission network elements is prioritised ahead of others when network congestion is the cause of the shortfall.
  - Take account of network equipment serving both load and generation.
  - Attempt to achieve an equitable distribution and rotation of load disconnection across participants in proportion to their consumption.
  - Consult with NSPs and other connected parties to ensure the priority list is practical.

15. ISO functions

Outcome:

- Over time, the remit of the ISO will expand to cover additional functions.
- The ISO will take control room functions in house in 2027.

16. ISO board (2)

Outcome:

- An ISO majority independent board comprising:
  - three independent directors, including the Chair, appointed by the Minister; and
  - two directors nominated by industry and each appointed by the Minister for three-year terms.
- To facilitate this change:
  - one additional independent director will be appointed;
  - two of the existing NSP directors will be retained for a two- and a three-year term respectively; and
  - upon expiry of each NSP director's term, a new director will be nominated by members for a three-year term.
- A reformed PAC will have an additional role of providing advice to the ISO Board, creating a new avenue for industry input to the ISO Board.
- To be appointed, any new Director must meet selection criteria, including any requisite skill requirements.

17. ISO budget

Outcome:

- The ISO board must consult on a draft budget.
- The ISO board will set the ISO budget annually.
- The ISO budget will be subject to review and approval by the Economic Regulation Authority.

18. ISO Fees

Outcome:

- Where an ISO cost is clearly attributable to an individual participant (initially connection activities and registration processing), costs will be recovered via processing fees.
- All other ISO costs will be recovered from participants based on gross injection and withdrawal figures into and from the NWIS.
- ISO fees for any given fee payer will be capped at 33.3% of total ISO fees.

19. Information

Outcome

- Market information will be public unless there is a compelling reason for it to remain confidential.
- The PNR will designate certain information as confidential (for example: terms, conditions and prices in bilateral contracts).
- Disclosers can request that information provided to the ISO be treated as confidential, and provide supporting reasoning. The ISO must determine whether the information meets PNR specified criteria for being confidential, in accordance with an ISO procedure.
- Disputes about classification of information will be resolved by the Coordinator of Energy.

20. Compliance monitoring

Outcome:

- The ISO will monitor participant compliance with the PNR, including the HTR.
- Initial focus areas for ISO monitoring will be portfolio balancing, dispatch compliance, and ESS performance.
- The ISO will publish quarterly compliance reports on the activities it monitors.
- The ERA will continue to monitor market behaviour, with additional focus required from the start of the balancing market.

21. Compliance enforcement

Outcome:

- The ISO will be able to issue formal warnings and requests for non-compliant parties to return to compliant operation.
- The ISO will be able to refer non-compliance to the ERA for investigation.
- The ERA will be able to levy monetary penalties (civil penalties) for non-compliance with civil penalty provisions, to be prescribed by the relevant Regulations.
- The ERA will have power to restrict participation in the trading market for participants who persistently fail to meet their traded energy quantities. Participant energy will still be settled in balancing.
- Disconnection will remain as a sanction of last resort.

22. NSP to NSP connection arrangements

Outcome:

- The PNR will include a process for the interconnection of additional networks to the NWIS.
- The ISO will manage the connection process for new networks, and for new interconnections between existing networks.
- Connecting networks must show compliance with Chapter 2 of the HTR, unless they are self-contained (established for the purpose of the participant serving only its own facilities).
- Generation, storage, and load facilities on the connecting network must demonstrate compliance with Chapter 3 of the HTR.
- Self-contained infrastructure may choose to demonstrate compliance at the interconnection point to the NWIS, instead of showing compliance of all equipment on the network.

23. Preferential supply for transmission foundation customers

Outcome:

- Scheduling and dispatch processes will endeavour to provide foundation customers of transmission infrastructure with firm supply for their loads when using the network components they have funded.
- Foundation customers of transmission infrastructure will be settled without imbalance penalties if their dedicated generation is constrained after trading positions are finalised.

24. Self-contained networks

Outcome:

- The PNR will distinguish between a network operator which provides services to third parties, and the operator of network infrastructure that is used only to serve load and generation of the same participant.
- Network operators who use their network equipment solely to service their own generation and load, can choose to be treated as a network user (demonstrating compliance at the interconnection point with the NWIS), or a network (compliance of all facilities within the network).
- A network owner which wants to be treated as a user, but is not an Excluded Network, will no longer be required to show non-compliance with the HTR in-order-to be able to opt for Connection Point Compliance.
- Currently an Excluded Network can have generation units with a maximum size of 10 MW. This definition will be maintained.
- Detailed design will consider appropriate definitions, including the definition of NSP.
- Proponents of new connections must provide the ISO with standing data and real-time data for individual pieces of equipment for equipment which could affect PSSR, even if their facilities are subject to connection point compliance.

25. Storage participation

Outcome:

- Controllers of storage works above 5 MW must register their facilities.
- A new defined term “Energy Producing System” will be added to encompass generation and storage facilities.
- Where appropriate, rules that refer to generation only will be broadened to refer to Energy Producing Systems.
- Technical requirements for storage works will be added to Chapter 3 of the HTR.

26. Demand side participation

Outcome:

- Special arrangements for flexible load are not yet required.
- When flexible load enters, balancing and ESS provisions will be revisited to ensure that flexible load can take advantage of available variable renewable energy.
- Owners of flexible loads will be allowed to contract with the ISO to provide Contingency Reserve Raise as interruptible load.
- Flexible load will be able to be designated as non-firm in the capacity adequacy process, so that it is not required to be matched by supply capacity.
- When the trading mechanism is introduced, owners of flexible loads can bid to purchase additional energy, and then manage their load to match their position.

27. HTR standards

Outcome:

- The HTR will set a default standard for “automatic qualification”. If a prospective connection meets this standard it meets the technical criteria to connect to the NWIS.
- NSPs will not have technical standards for connections in addition to the HTR.
- In the medium term a minimum standard for connection will be added to the HTR
- Connection will not be allowed for equipment that falls short of the minimum standard, but there will be a process for equipment that falls between the default and minimum standards.

28. HTR negotiation framework

Outcome:

- NSPs must negotiate with access seekers and consult with the ISO on requested departures from the default standard, and the ISO will have final power of approval (as it does for all connections).
- The ISO may provide guidance for acceptable bounds of negotiation, evidence, and mitigation measures.
- NSPs must publish estimated and actual timeframes for connection assessment activities in their control.
- NSPs and access seekers can escalate disputes to the ISO, and where the ISO is a party to the dispute, to an appropriate dispute resolution mechanism.
- NSPs and the ISO must publish agreed deviations from the default standard (whether above or below the standard).

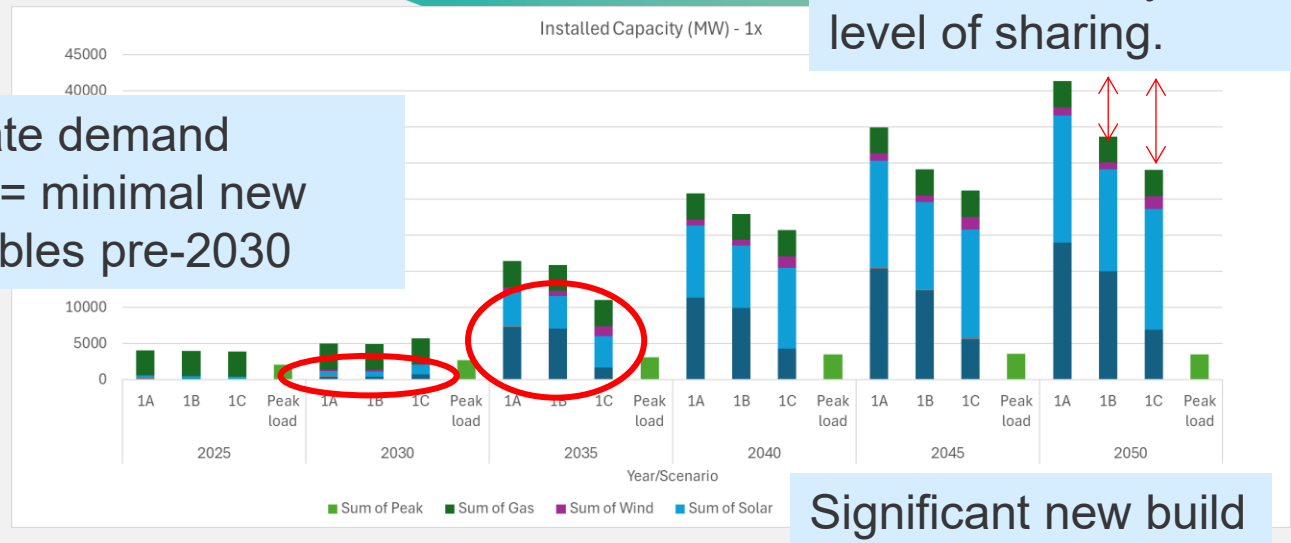
Appendix B. Modelling extracts

Generation Build

- In a high renewable future, significant ove needed due to the intermittent nature of t facilities, and to meet the carbon emissio
- The 2x scenarios have a greater proportion of new capacity coming from wind, enabled by the higher transmission build.
- Even though the overall demand is higher in the 2x scenarios, because there is more wind, the total installed capacity in the 2x scenarios is lower
- The fully integrated scenario (nC) requires less capacity when compared to nA and nB as resources are shared among the participants in the network
- Storage is integral in all scenarios to distribute intermittent capacity to other parts of the day and to provide firming capability to the system as gas facilities are restricted by emission targets

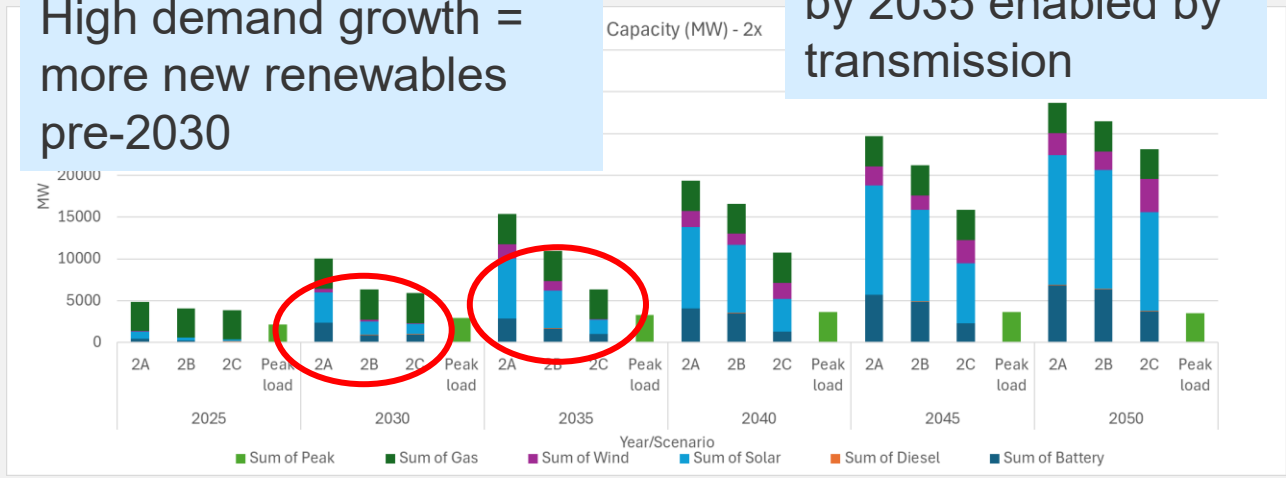
Differences in build needs driven by level of sharing.

Moderate demand growth = minimal new renewables pre-2030



Significant new build by 2035 enabled by transmission

High demand growth = more new renewables pre-2030



Note: The % of new capacity addition is based on PETA modelling data

Generation dispatch

- Thermal generation drops steadily to meet the assumed emission targets
- Batteries remain integral to meeting load when the intermittent generation is low
- Higher installed wind capacity in 2x when compared to 1x leads to two outcomes:
  - Contribution of wind is higher in 2x because wind is available through out the day and can contribute during peak periods (evening)
  - Battery contribution is lower in 2x since wind can provide when solar cannot (evening and overnight)

Proportion of renewable dispatch depends on fleet. More renewable dispatch in sharing scenarios, even though less build.