GOVERNMENT OF WESTERN AUSTRALIA

Department of Energy and Economic Diversification

Energy Policy WA

Evolution of the Pilbara Network Rules – Draft Implementation Plan

Consultation Paper

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Working together for a brighter energy future.

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Abbreviations

Term	Definition
EPWA	Energy Policy WA
ERA	Economic Regulation Authority
ESR	Electric Storage Resource
FCAS	Frequency Control Ancillary Service
HTR	Harmonised Technical Rules
ISO	Pilbara Independent System Operator
NWIS	North West Interconnected System
OCGT	Open Cycle Gas Turbine
PAC	Pilbara Advisory Committee
PETA	Pilbara Electricity Transformation Assessment
PET	Pilbara Energy Transition (Plan)
PNAC	Pilbara Networks Access Code
PNR	Pilbara Networks Rules
PSSR	Power System Security and Reliability
RoCoF	Rate of Control of Frequency
SCADA	Supervisory Control and Data Acquisition
SIA	Strategic Industrial Areas
SWIS	South West Interconnected System

Executive summary

The Pilbara Networks Rules (PNR) form part of the regulatory framework applying to the North West Interconnected System (NWIS). The Harmonised Technical Rules (HTR) are part of the PNR and specify the technical standards for equipment connected to the NWIS.

The PNR were designed around a power system that relies predominantly on a dispatchable thermal generation fleet comprised of gas turbines.

Following Australia's commitment to achieving net zero by year 2050, decarbonisation efforts are expected to lead to a radical change in the types of technologies supplying electricity in the Pilbara, and the system services needed to operate a secure and reliable power system. The capacity mix is anticipated to rapidly transition towards more variable renewable generation, energy storage resources, and increasingly flexible demand. The current arrangements will not support this transformation.

The Evolution of the PNR (EPNR) project was initiated to work closely with stakeholders – including the Pilbara Advisory Committee (PAC) – to identify and implement any changes necessary to evolve the PNR to ensure it enables and supports efficient decarbonisation of the Pilbara electricity system.

In February 2025, EPWA published a consultation paper proposing changes to many aspects of the PNR to enable the efficient transformation of the system, including:

- new governance arrangements for the Pilbara Independent System Operator (ISO), increasing its independence and transparency;
- an enhanced planning framework to ensure capacity adequacy and reliability, with backstop procurement powers for the ISO;
- amendments to the essential system services (ESS) arrangements to maintain system security, and improve incentives for connected parties to manage the need for these services;
- a centralised outage planning process, to maintain system reliability;
- a new balancing mechanism, providing connected parties and the ISO with new tools to manage increasingly variable supply and demand;
- consistent treatment of storage and demand side technologies, to allow these new technologies to contribute more effectively to maintain Power System Security and Reliability (PSSR) in the Pilbara; and
- a range of changes to the HTR to address existing gaps and address known issues.

This paper proposes an implementation plan with actions, timing and triggers for the implementation of the policy proposals, which were consulted on in the February consultation paper and continue to be refined in consultation with the PAC and its Working Group.

Proposed timings for rule changes relate to when these rule changes will be required. In practice, proposed rule changes are likely to be grouped, for the purpose of their consultation and commencement.

Call for Submissions

Stakeholder feedback is invited on the implementation plan for the evolution of the PNR outlined in this paper. Submissions can be emailed to energymarkets@deed.wa.gov.au. Any submissions not marked as confidential will be published on www.energy.wa.gov.au,. The consultation period closes at **12:00pm WST on 30 October 2025**. Late submissions may not be considered.

This implementation plan is being released alongside the implementation plan for the evolution of the Pilbara Electricity Access Regime. Separate submissions are requested on each plan.

A list of consultation questions to guide feedback is provided in section 4.6. Stakeholders are requested to reference the relevant action items they are providing comments on in their responses.

Table 1: Implementation activities

	Activity	Owner	Timing	Rationale for timing
1	Finalise proposed ISO governance, including board composition, nomination & appointment process.	EPWA	Q4 2025	Needed to implement ISO independence (action 2).
2	Introduce majority independent ISO board	EPWA	Q4 2025	An independently governed ISO is a prerequisite for the majority of the remaining activities.
3	Rule changes to implement the PAC HTR Working Group recommendations to complete the default standard.	EPWA	Q4 2025	Agreement from PAC that these technical rules changes are urgent.
4	Rule changes to remove requirement for parties seeking connection to be non-compliant with the HTR in order to gain status as a Connection Point Compliance (CPC) facility.	EPWA	Q4 2025	No need for additional design work.
5	Rule changes to rename existing services	EPWA	Q1 2026	No need for additional design work.
6	Rule changes to implement runway method for Contingency Reserve Raise (CRR) services cost recovery	EPWA	Q1 2026	No need for additional design work.
7	Rule changes to move meter data content and timing into PNR	EPWA	Q1 2026	No need for additional design work.
8	Rule changes to introduce “Energy Producing System” to PNR, so that storage is adequately covered	EPWA	Q1 2026	No need for additional design work.
9	Network Services Providers (NSPs) to retire their technical standards, to ensure that the HTR is the common set of technical standards for access and connection in the NWIS	NSPs	Q1 2026	Only possible when gaps in HTR have been addressed (action 3).
10	Rule changes to require ISO to publish the annual Pilbara System Plan (PSP) and the Coordinator to publish an integrated System Plan for the NWIS (akin to Whole of System Plan for the South West Interconnected System)	EPWA	Q2 2026	Provides a head of power for the PSP and the Coordinator integrated System Plan.
11	Develop project plan to bring control desk in-house in ISO	ISO	Q4 2025 - Q2 2026	Long lead time activity required.
12	Detailed design for Regulation services cost recovery	EPWA	Q4 2025 - Q2 2026	Current design is not fit-for-purpose, but replacement method needs additional design work.

	Activity	Owner	Timing	Rationale for timing
13	Develop and publish guidance for the network planning reliability standard	EPWA/ISO	Q4 2025 - Q2 2026	Standard needed ahead of new transmission infrastructure.
14	Develop new ESS procurement procedure, to include dynamic and locational ESS requirements	ISO	Q2 2026	Future proofs ESS requirements and their provision.
15	Develop and consult on outage coordination process, including risk framework	ISO	Q4 2025 - Q2 2026	Enables improved outage coordination. Builds on 2024 work by ISO.
16	Develop criteria for outage equipment list	ISO	Q4 2025 - Q2 2026	Implementation of new outage process.
17	Develop procedure to help participants identify outage impacts	ISO	Q4 2025 - Q2 2026	Required before commencement of new outage process.
18	Detailed design of ISO fees calculations	EPWA	Q4 2025 – Q2 2026	Current method needs amendment to reflect changes in ISO governance.
19	Detailed design of information management	EPWA	Q1 2026 – Q2 2026	Enables long term planning arrangements.
20	Rule changes to implement new ISO fees arrangements	EPWA	Q2 2026	Current method needs amendment to reflect changes in ISO governance.
21	Rule changes to require additional meter data if needed for ISO fees	EPWA	Q2 2026	Supports new ISO fees recovery method.
22	Rule changes to implement new information management framework	EPWA	Q2 2026	Supports long term planning arrangements.
23	Rule changes to implement network planning reliability standard	EPWA	Q3 2026	Provides certainty for new transmission infrastructure.
24	Rule changes to implement new Regulation services cost recovery method	EPWA	Q3 2026	Current design is not fit-for-purpose, but replacement method needs additional design work.
25	Rule changes to provide for establishment of HTR minimum standard	EPWA	Q3 2026	A head of power needed before development can commence activity.
26	Develop and consult on an ESS accreditation framework procedure	ISO	Q3 2026	Needed to ensure adequate performance by ESS providers.

	Activity	Owner	Timing	Rationale for timing
27	Detailed design for new compliance monitoring and enforcement mechanism	EPWA	Q1 2026 - Q3 2026	Needed for a system with growing number of participants.
28	Development of technical standards for storage	ISO	Q1 2026 - Q3 2026	Enables growing storage participation.
29	Rule change to require ISO to develop manual load shedding priority list	EPWA	Q4 2026	In preparation for power system with growing numbers of technologies and participants.
30	Rule changes to amend ISO budget arrangements	EPWA	Q4 2026	Current arrangements need amendment to reflect changes in ISO governance.
31	Rule changes to introduce enhanced compliance monitoring and enforcement mechanisms	EPWA	Q4 2026	Needed for a system with growing number of participants.
32	Start monitoring of ESS providers performance	ISO	Q4 2026	Necessity for a secure power system, but needs design work first.
33	Rule changes to introduce outage coordination by ISO	EPWA	Q4 2026	Allows improved outage coordination, and confidence of connected parties in level playing field.
34	Rule change to introduce technical standards for storage into HTR	EPWA	Q4 2026	Enables growing storage participation, but design work required first.
35	Conduct power system studies to assess RoCoF ride through capability of existing equipment	ISO	Q4 2026	Provides operational limits for HTR minimum standard.
36	Develop and consult on ISO PSP procedure	ISO	Q3 2026 - Q4 2026	Supports system planning ahead of large scale new transmission infrastructure.
37	Detailed design for NSP to NSP interconnections	EPWA	Q2 2026 - Q4 2026	Provides certainty for new transmission infrastructure.
38	Rule changes to provide a head of power for ISO to manage NSP to NSP interconnections.	EPWA	Q1 2027	Provides certainty for new transmission infrastructure.
39	Detailed design of treatment of foundation transmission customers in case of network constraints	EPWA	Q3 2026 – Q2 2027	Needs to be in place in time for potential customers to understand what the market design will be when they connect.

	Activity	Owner	Timing	Rationale for timing
40	Prepare and publish first PSP	ISO	Q2 2027	Earliest reasonable date at which new planning approach can be applied.
41	Rule changes to implement treatment of foundation transmission customers in case of network constraints	EPWA	Q2 2027	Needs to be in place in time for potential customers to understand what the market design will be when they connect.
42	Develop and consult on procedure for NSP to NSP interconnections.	ISO	Q3 2026 - Q2 2027	Provides certainty for new transmission infrastructure.
43	Detailed design for provision of Contingency Reserve Raise by loads.	EPWA	Q1 2027 - Q2 2027	Depends on presence of flexible loads in the NWIS.
44	Develop fault level requirements for the NWIS	ISO/NSPs	Q1 2027 - Q3 2027	Supports new transmission infrastructure.
45	Detailed design for new self-contained network arrangements	EPWA	Q3 2026 - Q3 2027	Provides for connected parties to maintain control of their own operations, where practical, ahead of new connections and more significant changes to market structures.
46	Develop minimum HTR standard for connection to the NWIS	EPWA	Q4 2026 - Q3 2027	Of secondary importance to default standard, but still needed in medium term.
47	Detailed design for HTR negotiation framework	EPWA	Q1 2027 - Q3 2027	Sits alongside development of minimum technical standards.
48	Rule changes to amend HTRs to specify fault level requirements	ISO	Q4 2027	Allows time for design work.
49	Rule changes to implement new self-contained network arrangements	EPWA	Q4 2027	Provides for connected parties to maintain control of their own operations, where practical, ahead of new connections and more significant changes to market structures.
50	Rule changes to allow flexible loads to provide Contingency Reserve Raise	EPWA	Q4 2027	Depends on presence of flexible loads in the NWIS.
51	Rule changes to implement minimum connection standard in the HTR.	EPWA	Q4 2027	Implementation after other more pressing items.

	Activity	Owner	Timing	Rationale for timing
52	Rule changes to introduce HTR negotiation framework	EPWA	Q4 2027	Implemented along with minimum technical standards.
53	Develop and consult on manual load shedding priority list	ISO	Q4 2027	Allows time for ISO to develop and consult on the list.
54	ISO takes over control desk operations	ISO	Q4 2027	Complex activity, significant lead time required to implement.
55	Detailed design of capacity forecasting process	EPWA	Q2 2027 - Q4 2027	Depends on trigger conditions.
56	Coordinator prepares and publishes integrated System Plan for the NWIS	Coordinator	Q4 2027	Allows time after publication of first PSP.
57	Rule changes to require ISO to implement manual load shedding list	EPWA	Q1 2028	Allows time for ISO to consult on the list.
58	Rule changes to require ISO to produce capacity forecasts	EPWA	Q2 2028	Depends on trigger conditions.
59	Rule changes to introduce Contingency Reserve Lower (CRL) service	EPWA	Q4 2028	Depends on trigger conditions.
60	Rule changes to implement CRL cost recovery	EPWA	Q4 2028	Implemented along with new CRL service introduction.
61	Produce first capacity forecast	ISO	Q4 2028	Depends on trigger conditions, but needed several years ahead of significant renewable generation.
62	Detailed design for determining individual capacity requirements	EPWA	Q1 2029 - Q4 2029	Depends on trigger conditions.
63	Detailed design for capacity certification	EPWA	Q1 2029 - Q4 2029	Depends on trigger conditions.
64	Rule changes to introduce capacity certification	EPWA	Q1 2030	Depends on trigger conditions, but needs to be implemented a couple of years before commencement of new balancing and trading arrangements.

	Activity	Owner	Timing	Rationale for timing
65	Rule changes to introduce individual capacity requirements	EPWA	Q1 2030	Depends on trigger conditions, but needs to be implemented a couple of years ahead of new balancing and trading arrangements.
66	Develop, consult on, and publish method for determining individual capacity requirements	ISO	Q2 2030	Depends on trigger conditions, but needs to be implemented a couple of years ahead of new balancing and trading arrangements.
67	Develop, consult on, and publish capacity certification procedure	ISO	Q1 2030 - Q2 2030	Depends on trigger conditions, but needs to be implemented a couple of years ahead of new balancing and trading arrangements.
68	Develop and implement monitoring for compliance with individual capacity requirements	ISO	Q3 2030	Implemented once new requirements are in place.
69	Commence determination of capacity requirements	Connected parties	Q3 2030	Depends on trigger conditions, but needs to be implemented a couple of years ahead of new balancing and trading arrangements.
70	Detailed design of backup capacity procurement	EPWA	Q1 2030 - Q3 2030	Depends on trigger conditions, but needs to be implemented ahead of new balancing arrangements.
71	Review and approve individual capacity requirements	ISO	Q4 2030	Depends on trigger conditions, but needs to be implemented a couple of years ahead of new balancing and trading arrangements.
72	Certify capacity	Capacity providers, ISO	Q3 2030 - Q4 2030	Depends on trigger conditions, but needs to be implemented a couple of years ahead of new balancing and trading arrangements.
73	Rule changes to require ISO to procure backup capacity in certain circumstances	EPWA	Q1 2031	Depends on trigger conditions, but needs to be implemented ahead of new balancing arrangements.
74	Detailed design of loads participation in capacity certification, balancing, and trading arrangements	EPWA	Q3 2030 - Q1 2031	Depends on trigger conditions.
75	Rule changes to enable flexible load inclusion in capacity certification, balancing, and trading arrangements	EPWA	Q2 2031	Depends on trigger conditions.

	Activity	Owner	Timing	Rationale for timing
76	First potential capacity procurement	ISO	Q2 2032	Depends on trigger conditions, but needs to be implemented ahead of new balancing arrangements.
77	Detailed design of balancing mechanism	EPWA	Q1 2030 - Q3 2032	Design needs to be completed before trigger conditions indicate that introduction is needed.
78	Detailed design for trading mechanism	EPWA	Q1 2030 - Q3 2032	Design needs to be completed before trigger conditions indicate that introduction is needed.
79	Rule changes to introduce balancing mechanism	EPWA	2033	Dependent on trigger conditions.
80	Develop and implement monitoring of dispatch compliance	ISO	2033	Dependent on trigger conditions.
81	Rule changes to introduce trading mechanism	EPWA	2033	Alongside balancing mechanism.

1. Introduction

1.1 Background

With its large natural resources and mining operations the Pilbara region, located in the north of Western Australia (WA), is a significant contributor to Australia's economy. Being the top supplier of iron ore in the world, the Pilbara accounts for 14.7% of Western Australia's and 2.3% of the entire country's GDP[1].

The unique context of the Pilbara, and the commercial drivers of the resource sector, has led to separate or weakly interconnected transmission systems to maintain a secure and reliable electricity supply for large mining corporations. The North West Interconnected System (NWIS) consists of several independent interconnected networks owned by different private companies and a public utility. Although interconnected, each network operator has their own network requirements and restrictions.

The NWIS is governed by the Pilbara Network Rules (PNR), which were designed around a power system that is based predominantly on dispatchable thermal generation comprised of gas turbines. The Harmonised Technical Rules (HTR) are part of the PNR and specify the technical standards for network operators and equipment connected to the NWIS.

Following Australia's commitment to achieving net zero by 2050, decarbonisation efforts are expected to see a radical change in the types of technologies that are available to supply electricity in the Pilbara, and the system services needed to operate a secure and reliable power system. As a result, the Pilbara system will transition to more variable renewable generation, energy storage resources, and increasingly flexible demand.

1.2 The Evolution of the Pilbara Networks Rules Project

In late 2023, the WA Government endorsed the Pilbara Energy Transition (PET) Plan based on the consensus of the Pilbara Industry Roundtable discussions. Among the PET Plan objectives is encouraging common-use electricity infrastructure to increase the networks' efficiency and to support the anticipated growth of renewable energy and the decarbonisation in the Pilbara.

The Evolution of the Pilbara Networks Rules (EPNR) project was initiated to work closely with stakeholders – including the Pilbara Advisory Committee (PAC) – to identify and implement any changes necessary to evolve the PNR to ensure it enables and supports the efficient decarbonisation of the Pilbara electricity system.

The PAC has established the EPNR Working Group to support this project, with two workstreams:

- Workstream 1 supports the evolution of the PNR; and
- Workstream 2 is developing changes to the HTR standards.

The PAC has been kept informed of the working group's progress in each of its regular meetings.

The EPNR project is being carried out in four stages.

- Stage 1 established the governance mechanism that supports the analysis and development necessary to complete the scope of the project. A scope of works and the working group were created to complete this stage.
- Stage 2 developed and modelled scenarios to establish a trajectory or trajectories that meet(s) the Pilbara decarbonisation goals. This activity included the modelling of generation and storage development scenarios.

[1] https://app.remplan.com.au/pilbararegion/economy/industries/output

- Stage 3 assessed the effectiveness and efficiency of the existing PNR against the decarbonisation goals of the region, as well as the results from Stage 2. The working group considered a list of development issues drawn from the modelling, the Pilbara round table, and other stakeholder feedback. Draft proposals were developed by EPWA and discussed with the PAC and its EPNR Working Group, and EPWA compiled these in a consultation paper, which was published for public feedback in February 2025.
- Stage 4 is preparing an implementation plan to sequence the proposals in accordance with their urgency and appropriate triggers for their implementation.

This consultation paper sets out the proposed implementation plan, and seeks stakeholder's feedback. At this stage EPWA is not seeking further feedback on the policy proposals, as these were consulted earlier in the year.

1.3 Structure of this paper

This paper presents the proposed implementation plan.

- Chapter 2 discusses the considerations that shaped the plan, including the priorities for the implementation of the various proposals, the dependencies between activities, and the potential triggers for some of the proposals' implementation.
- Chapter 3 discusses the implementation activities for each of the proposals from the previous consultation paper, identifying the actions required, as well as the constraints and dependencies.
- Chapter 4 presents a chronological view of the plan, showing how the activities fit together into a continuous timeline, including how the role of the ISO is proposed to evolve as reform activities are progressed.

2. Phasing and dependencies

In developing the implementation plan, EPWA has considered a variety of factors.

Some initiatives are more pressing than others according to the three limbs of the state electricity objective:

- to maintain power system security and reliability;
- to enable emissions reduction;
- to enable efficient costs;

For example, the highest priority activity is implementing the changes to the HTR identified by the PAC Working Group and discussed in chapter 7 of the February consultation paper. This activity is scheduled for completion by the end of 2025.

Some initiatives need further design work, while others can proceed directly to proposed rule changes. For example, the new approach to the Contingency Reserve Raise services is clear, and can be reflected in proposed rule amendments, while detailed design is needed for a new cost recovery approach for the Regulation services.

Some initiatives are not needed until power system characteristics change. For example, existing capacity certification and balancing arrangements will suffice until there is sufficient growth of variable renewable generation connected to the power system.

Some initiatives are dependent on others, which must be delivered first. For example, changes to ISO's cost recovery arrangements depend on availability of meter data.

Finally, required effort and available bandwidth considerations mean that not everything can be implemented at once. Many of the initiatives are needed with greater or lesser urgency, and the overall programme of work has been constructed to spread the work over time.

2.1 Efficient implementation

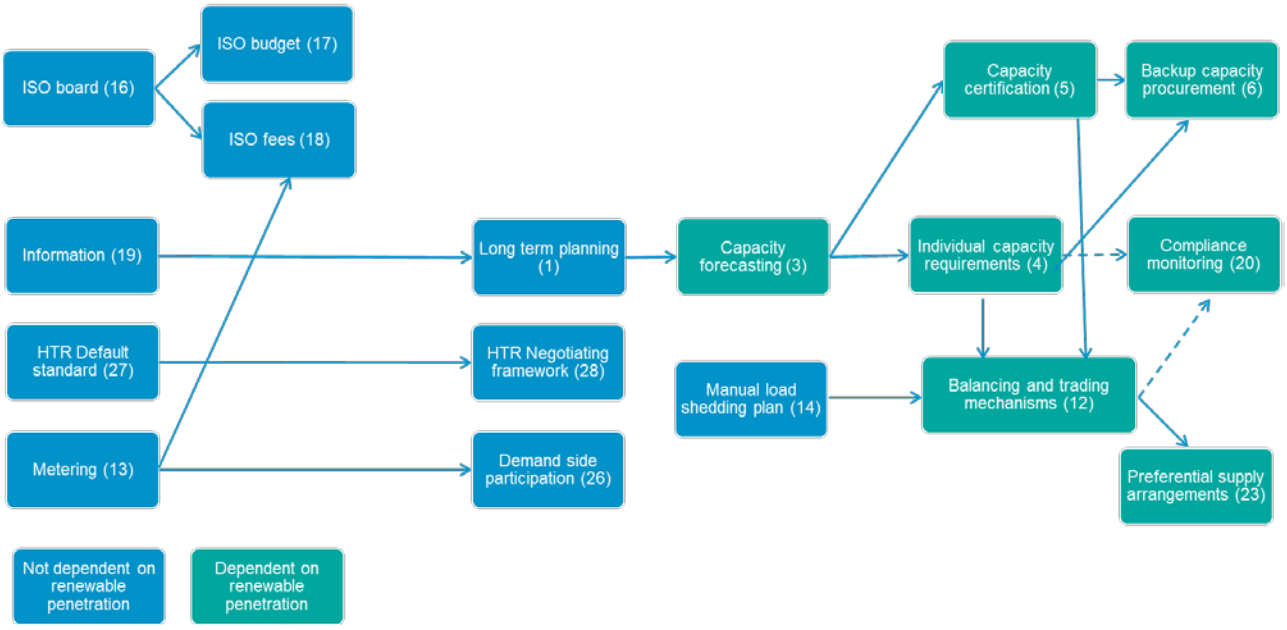
Modelling undertaken during this project has shown that reforms aimed at enabling greater sharing of energy resources in the Pilbara have the potential to avoid significant system-wide costs. EPWA considers that the costs and benefits of the way individual reform proposals are proposed to be implemented, and whether they continue to be consistent with the State electricity objective, can only be properly assessed once detailed design is completed, and draft Rules are available.

Stakeholders will have the opportunity to continue to comment on cost considerations throughout the implementation process. EPWA will continue to engage with stakeholders on timing for implementation of reforms as the pace of decarbonisation of the Pilbara power system becomes clearer. This will include regular updates and discussions with the Pilbara Advisory Committee on the progress and direction of the implementation plan.

2.2 Dependencies

Figure 1 shows dependencies between activities, with proposal numbers from the February consultation paper shown in parentheses.

Figure 1: Activity dependencies



There are two main groups of dependent activities.

One relates to changes to the ISO's governance, will necessitate changes to the way ISO budgets are prepared and its fees are recovered.

The other relates to the set of arrangements required to manage large volumes of renewable energy on the power system. A more sophisticated balancing mechanism needs to be developed on a clear understanding of individual capacity requirements; individual capacity requirements rely on a reasonable capacity forecast; capacity forecasting relies on long term planning; and long term planning relies on information availability.

If this sequence of activities is not completed before significant quantities of variable renewable generation comes online, connected parties will need to build more generation (including firming resources) to serve their own load than they would need if mechanisms for sharing resources were available. These initiatives will require considerable effort over a number of years, so need to start some time ahead of the final step in the plan.

2.3 Reform trigger points

Some of the larger reforms are not needed to manage the current power system. They will only be beneficial once there is a large volume of variable renewable generation connected to the NWIS, serving a significant proportion of demand. 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.

Implementing these changes too early would mean reduced discretion for connected parties to manage their own portfolios, additional cost from a larger and more complex ISO, and greater complexity (and potentially greater costs) for new investors.

Current capacity, trading and balancing arrangements will suffice until the characteristics of the generation fleet change. However, if changes are delayed for too long, self-balancing will become less and less efficient, the risk of unserved energy will increase, parties will have to build more and

more resources in order to remain self-sufficient, and the ISO will have to procure larger quantities of ESS to respond to volatility.

At some point the ISO will need to take a more active role in managing capacity adequacy and power system scheduling and dispatch. The question is when. This section discusses appropriate trigger points.

2.3.1 Increased use of Essential System Services (ESS)

The current NWIS has relatively few network constraints, so the ISO's control desk is generally only required to monitor power system security and reliability, with the ability to give directions in accordance with the Protocol Framework Procedure, constraint directions, directions under ESS contract and emergency directions. Direction powers are generally exercised infrequently.

As new transmission infrastructure is commissioned, variable generation increases, and new supply and demand connects to the NWIS, network constraints will become more frequent, and the ISO will need to intervene more often to remedy potential system risks.

At present, Balancing Nominees have an obligation to balance and the contracted ESS provider becomes the balancing provider for small, short-term imbalances, by virtue of the service provided responding to changes in frequency.

EPWA considers that ESS costs are a useful metric to help determine when to implement new arrangements. Annual ESS costs in 2024 were around $6.5m. Past implementations of market design changes in the SWIS cost in the $10-$15 million range. If costs to implement a new approach to capacity adequacy and a new balancing arrangements for the Pilbara are similar, then a doubling of annual ESS costs would likely be sufficient to justify implementation.

Thus, ESS increase in volumes or costs could be used as a trigger for when change is needed.

2.3.2 Balancing and trading

The 2024 modelling showed that shared use of the Pilbara energy infrastructure resources will provide significant cost savings as the volatility of the generation fleet increases. Clear benefits of system resources sharing were identified once several hundred MW of renewable generation capacity is connected to the system, and makes up around 20% of all energy consumed in the NWIS. Benefits come both from reduced capital requirements, more efficient scheduling of connected resources and reduced ESS requirements.

The current best estimate is that the NWIS will see a large growth of renewable generation when new transmission is connected in around 2031, though an increase in the rate of load growth above the historical average could see large volumes of variable renewable generation connecting ahead of new transmission commissioning.

This level of variable renewable penetration will almost certainly be reached by 2035, and could be reached as soon as 2030. Mechanisms to allow sharing of system resources must be in place by the early 2030s, and the design communicated well ahead of that time so that generation and transmission developers can understand the future market arrangements as they make investment decisions.

EPWA proposes that a new balancing mechanism be implemented to align with the forecast timing of:

- Variable renewable generation supplying 20% of all energy on the NWIS; or
- 750 MW of variable renewable generation capacity being connected to the NWIS; or
- ESS costs doubling from 2024 values.

This will require regular power system forecasting, and for work to start on design well ahead of the forecast commencement date.

2.3.3 Supply adequacy

Currently, there is enough spare capacity connected to the NWIS, so the ISO has suspended the application of generation adequacy requirements in Chapter 6 of the PNR. These arrangements revolve around self-certification. Self-certification is relatively simple for a fleet of predominantly thermal generation, but more complex for variable generation and storage.

The current arrangements also suit a model in which parties are balancing their own portfolios. With greater quantities of non-vertically integrated demand, more sharing of system resources between connected parties and a greater proportion of variable supply, this needs to change.

To enable activities to be completed in time to support more sophisticated balancing arrangements, EPWA proposes to start capacity forecasting either 5 years before the projected commencement of a new balancing mechanism (as discussed in section 2.3.2), or when variable renewable generation is supplying 10% of energy on the NWIS, whichever is later. This would ensure that capacity forecasting is not begun until there is material increase of variable renewable generation, but that there is sufficient time to implement other required initiatives before more sophisticated balancing arrangements need to be in place.

Once capacity forecasting is in place, the next steps will be to implement individual capacity requirements and certification for capacity providers. This could be linked to another generation level milestone, but it would be simpler to provide certainty by linking it to elapsed time from capacity forecasting. EPWA is proposing that these activities be implemented two years after capacity forecasting begins, which should allow time for them to bed in before embarking on the implementation of new balancing arrangements.

To support the new balancing arrangements, backup capacity procurement will be needed. This should be implemented when there is growing uncertainty around available supply, and that uncertainty is not managed by default within each portfolio. EPWA proposes that backup capacity procurement be implemented either two years ahead of projected commencement of new balancing arrangements, or when 10% of load is served by non-vertically integrated parties, whichever is later. Until both criteria are met, a central procurement mechanism would be unnecessary.

2.3.4 Contingency Reserve Lower ESS

In the current power system, the quantity of load rejected in any credible contingency is small enough that it could be compensated for by automatic droop response from connected thermal generation, and there is no need for a paid Contingency Reserve Lower service. This could change if:

- More large loads connect to the system;
- Thermal generation retires; and/or
- Large energy storage resources connect.

At that time, a Contingency Reserve Lower service will be needed to manage risk of load rejection.

2.3.5 Demand side participation

At present, demand on the NWIS is relatively inflexible. Demand is driven by industrial processes, there is limited scope to adjust demand to available generation, and any shift needs significant advance notice. Therefore, there is currently limited benefit from designing demand side participation into core market processes.

EPWA proposes that demand side participation be implemented when the NWIS reaches 100 MW of flexible load. This quantity could provide a meaningful contribution as interruptible load for Contingency Reserve Raise services or participate in the new balancing arrangements.

2.3.6 Alternative implementation triggers

EPWA has identified the quantity and proportion of renewable generation and its impact on ESS costs as the major change driving the need for more fundamental design changes to resource adequacy, and energy scheduling and dispatch arrangements, but other potential triggers could also be monitored to identify when these changes are required, including:

- year-to-year increase in renewable generation;
- new participants;
- new transmission connections; and
- retirement of thermal generation.

Year-to-year increase in renewable generation

Instead of monitoring the proportion of total renewable generation, further reforms could instead be triggered by a significant change in the connection rate of variable renewable generation. A significant volume of renewable generation is expected to connect to the NWIS when new transmission infrastructure is commissioned. If this metric was used as a trigger condition, change would be triggered by that rather than a steady rate of renewable generation connections to the existing connected networks.

New participants

Existing connected parties are used to supplying their own load and balancing with their own generation. This could continue into the future, with parties building sufficient generation to meet their own needs, even though less expenditure would be required overall if some of the infrastructure was shared.

New participants have the potential to change this balance, giving rise to the need for an enhanced capacity adequacy mechanism, and balancing and trading arrangements. If the number of new participants was used as a trigger for reform activity, these activities would not be commenced until new participants with a clear need had connected to the system.

EPWA considers that triggering reforms based on new participant entry is not practical, as a lack of these reforms would present a barrier to entry of new non-vertically integrated parties. These reforms would need to be in place to give prospective entrants confidence that they can manage their risk in a market with large volumes of variable generation.

New transmission connections

New transmission infrastructure will increase the total generation and load connected to the NWIS. Significant new transmission is planned in the Pilbara, with a particular goal of accessing new renewable generation opportunities. There are also several existing networks which could decide to interconnect with the NWIS, providing the parties connected to these existing networks opportunity to optimise the operation of their loads and their excess generation.

If transmission interconnection does not happen, there will be less opportunity for new participants to join the NWIS, and the current load following arrangements may remain, regardless of the proportion of variable renewables on the system. This would require existing and new parties to continue to overbuild renewable and firming generation, with suitable diversity to meet their own needs, rather than sharing energy and services across portfolios and reducing the overall system cost.

Retirement of thermal generation

Large volumes of variable generation require sufficient fast responding firm dispatchable resources to manage supply volatility. If most connected parties are prepared to keep their thermal generation available to respond to this, reserve margins would remain high, and it may not be

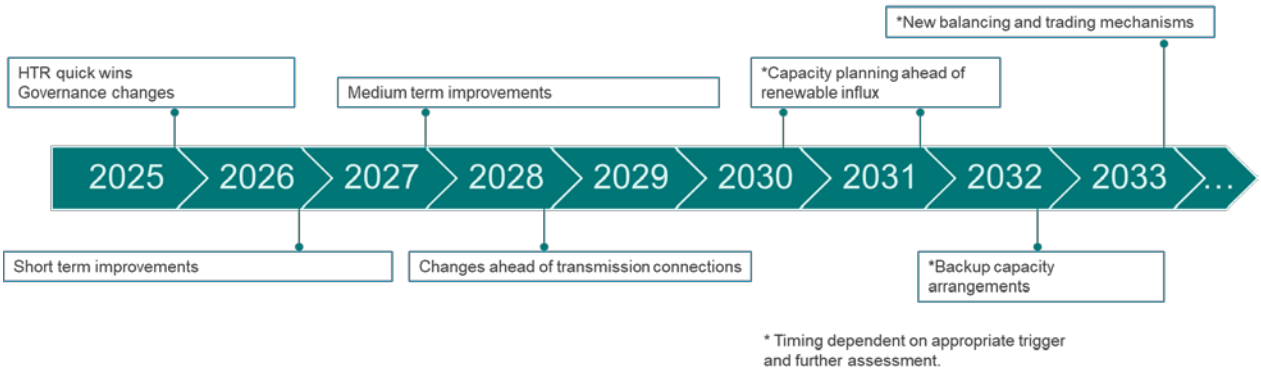
necessary to spend time and effort on centrally managing resource adequacy. Reforms could then be timed to coincide with cumulative retirements of thermal capacity reaching a certain level.

2.4 High level phasing

Figure 2 shows a high-level overview of the implementation plan:

- Immediate changes are focused on ISO governance and fees, and amendments to the HTR identified by the HTR working group.
- Work in 2026 and 2027 will deliver incremental improvements to existing arrangements.
- 2028 introduces new processes required in advance of major transmission infrastructure expected in the early 2030s.
- 2030 sees new capacity adequacy arrangements introduced, in readiness for high volumes of variable renewable generators connecting in the coming years.
- Once renewable generation connection applications would increase renewable generation to reach the triggers identified in section 2.3.2, implementation of new balancing and trading mechanisms is commenced to allow more effective resource sharing, and better real-time management of the system by the ISO.

Figure 2: High level phasing



For a more detailed view, see Chapter 4.

2.5 Ongoing review and monitoring

This proposed implementation plan is based on current expectations for the Pilbara development and reaches nearly a decade into the future. Including triggers for some of the later initiatives allows flexibility to changing circumstances, and EPWA acknowledges that many circumstances may change over the planning horizon. Some activities may take more or less time than anticipated, and new requirements may emerge.

It would, therefore, be prudent to set expectations for ongoing monitoring of progress against the implementation plan, with opportunities for discussion and adjustment as time goes on.

EPWA will continually review the planned activities and their timeframes and will update the PAC on progress at each of its meetings. This will allow interested parties to review and discuss the overall plan regularly, without creating significant additional overhead.

3. Implementation activities by proposal

This chapter discusses each of the proposals from the previous consultation paper, their dependencies any implementation triggers, and the actions required to implement the proposal. Proposed timings for rule changes relate to when the rule change will be ready. In practice, changes are likely to be grouped, for the purpose of their consultation and commencement.

3.1 ISO board

Under this proposal:

- The ISO will have a 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.

3.1.1 Dependencies and triggers

Changes to ISO governance means that changes will be needed to the approach to setting the ISO budget, and ISO fees and their recovery.

3.1.2 Actions

ID	Action	Owner	Start date	End date
1	Finalise proposed ISO governance, including board composition, nomination & appointment process.	EPWA		Q4 2025
2	Introduce majority independent ISO board	EPWA		Q4 2025

3.2 HTR standards

Under this proposal:

- The HTR will set a default standard for "automatic" compliance. If a prospective connection meets this standard, it meets the technical requirements to connect to the NWIS.
- Covered 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 in consultation with stakeholders.
- Connection will not be allowed for equipment that falls short of the minimum standard, but there will be a negotiation process for equipment that falls between the default and minimum standards.

3.2.1 Dependencies and triggers

None.

3.2.2 Actions

ID	Action	Owner	Start date	End date
3	Rule changes to implement the PAC HTR working group recommendations to complete default standard.	EPWA		Q4 2025
9	Network Services Providers (NSPs) to retire their technical standards, to ensure that the HTR is the common set of technical standards for access and connection in the NWIS.	NSPs		Q1 2026
25	Rule changes to provide for establishment of HTR minimum standard.	EPWA		Q3 2026
46	Develop minimum HTR standard for connection to the NWIS	EPWA	Q4 2026	Q3 2027
51	Rule changes to implement minimum connection standard in the HTR.	EPWA		Q4 2027

3.3 ESS framework

Under this proposal:

- 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”.
- Power system security will be managed by defined ESS requirements rather than by a minimum synchronous generation requirement.
- 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.
- 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.
- When there is credible risk of load loss that cannot be addressed by available droop response, a new Contingency Reserve Lower service will be introduced to manage unplanned loss of load.

3.3.1 Dependencies and triggers

A Contingency Reserve Lower service is not currently required, as there is sufficient droop response to cover any foreseeable loss of load. In future, if load contingencies increase or large

electric storage resources connect, the potential load loss could exceed available droop response. In this situation, a Contingency Reserve Lower service will be required.

3.3.2 Actions

ID	Action	Owner	Start date	End date
5	Rule changes to rename existing services	EPWA		Q1 2026
14	Develop new ESS procurement procedure, to include dynamic and locational ESS requirements.	ISO		Q2 2026
26	Develop and consult on an ESS accreditation framework procedure	ISO		Q3 2026
35	Conduct power system studies to assess RoCoF ride through capability of existing equipment	ISO		Q4 2026
59	Rule changes to introduce Contingency Reserve Lower (CRL) service	EPWA		Q4 2028

3.4 ESS cost recovery

Under this proposal:

- ESS costs will be recovered from causers, where practical, on a trading interval basis.
- Regulation costs will be allocated to participants who vary, beyond an applicable tolerance, 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.
- Facilities will be exempt from Contingency Reserve Raise costs if they provide evidence that a facility trip would be automatically offset by load curtailment on the same site.
- Contingency Reserve Lower costs will be allocated to large loads based on their demand in each interval, according to the runway method.

3.4.1 Dependencies and triggers

Contingency Reserve Lower cost recovery will need to be implemented at the same time as that service is introduced (action 59).

3.4.2 Actions

ID	Action	Owner	Start date	End date
6	Rule change to implement runway method for Contingency Reserve Raise (CRR) service cost recovery	EPWA		Q1 2026
12	Detailed design for Regulation services cost recovery	EPWA	Q4 2025	Q2 2026
24	Rule changes to implement new Regulation services cost recovery method	EPWA		Q3 2026
60	Rule changes to implement CRL cost recovery	EPWA		Q4 2028

3.5 Metering

Under this proposal:

- 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.

3.5.1 Dependencies and triggers

Additional meter data may be needed for the new ISO fee calculations (action 21).

3.5.2 Actions

ID	Action	Owner	Start date	End date
7	Rule changes to move meter data content and timing into PNR	EPWA		Q1 2026
21	Rule changes to require additional meter data if needed for ISO fees	EPWA		Q2 2026

3.6 Storage participation

Under this proposal:

- Controllers of storage works above 5 MW must register their facilities, if they are connecting to the NWIS.
- A new defined term “Energy Producing System” will be added to encompass generation and storage facilities.
- As 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.

3.6.1 Dependencies and triggers

None.

3.6.2 Actions

ID	Action	Owner	Start date	End date
8	Rule changes to introduce “Energy Producing System” to PNR, so that storage is adequately covered.	EPWA		Q1 2026
28	Development of technical standards for storage	ISO	Q1 2026	Q3 2026
34	Rule change to introduce technical standards for storage into HTR	EPWA		Q4 2026

3.7 Long term planning

Under this proposal:

- The ISO will have effective information-gathering powers for all projects 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 above plans.
- Input and output data for the system plans will be published for transparency with commercial sensitivity respected.
- In years when 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. From 2030, the Generation Statement of Opportunities will be required annually.

3.7.1 Dependencies and triggers

Implementing new long term planning arrangements will require changes to the information management framework in the PNR (action 22), to allow the ISO and the Coordinator to collect additional information, to ensure the information can be used for its intended purpose, and to ensure relevant information can be published by the ISO and the Coordinator.

Long term planning is required to enable effective capacity forecasting (action 55).

3.7.2 Actions

ID	Action	Owner	Start	End
10	Rule changes to require ISO to publish the annual Pilbara System Plan (PSP) and the Coordinator to publish an integrated System Plan for the NWIS (akin to Whole of System Plan for the South West Interconnected System)	EPWA		Q2 2026
36	Develop and consult on ISO PSP procedure	ISO	Q3 2026	Q4 2026
40	Prepare and publish first PSP	ISO		Q2 2027
56	Coordinator prepares and publishes integrated System Plan for the NWIS	Coordinator		Q4 2027

3.8 ISO functions

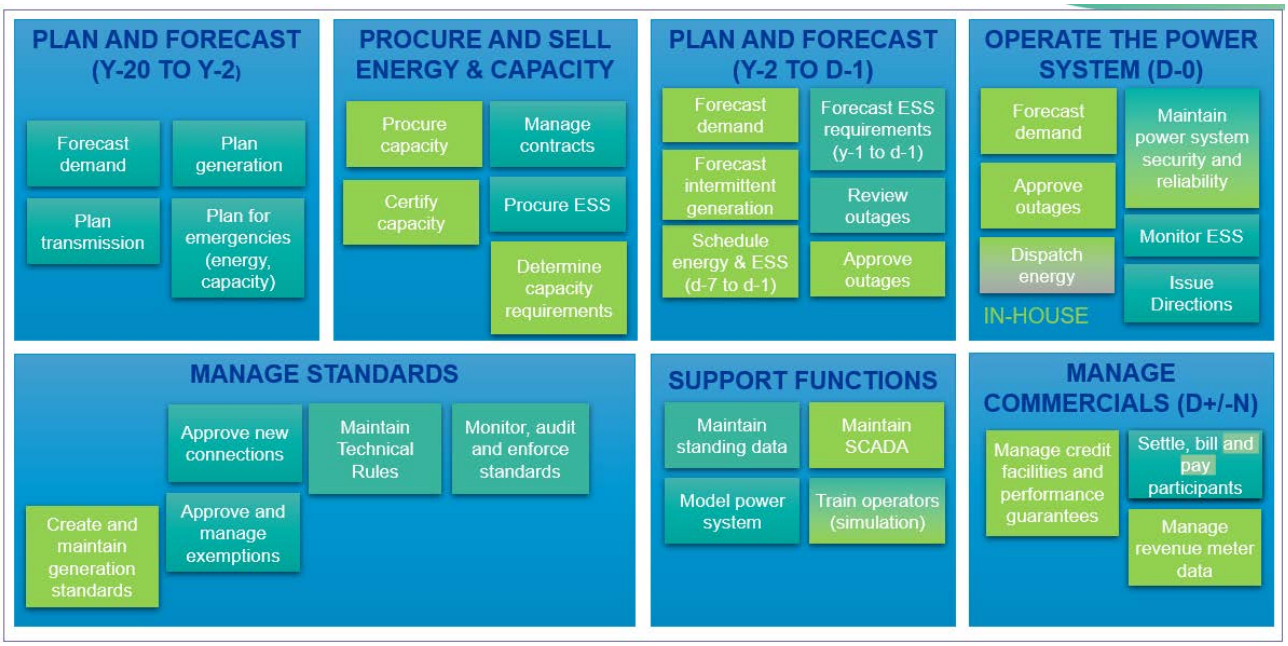
Under this proposal:

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

Figure 3 shows ISO functions today, and Figure 4 shows ISO functions if all proposed reforms are implemented.

Figure 3: ISO functions today

Figure 4: ISO functions 2033



3.8.1 Actions

ID	Action	Owner	Start date	End date
11	Develop project plan to bring control desk in-house	ISO	Q4 2025	Q2 2026
54	ISO takes over control desk operations	ISO		Q4 2027

3.9 Network reliability planning standard

Under this proposal:

- 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 can be used instead.
- The standard will not apply to self-contained networks, as long as associated outages do not affect the rest of the power system.
- 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 level of service arrangements with existing connected parties, if this is not already the case.

3.9.1 Dependencies and triggers

None.

3.9.2 Actions

ID	Action	Owner	Start	End
13	Develop and publish guidance for the network planning reliability standard	EPWA/ISO	Q4 2025	Q2 2026
23	Rule changes to implement network planning reliability standard	EPWA		Q3 2026

3.10 Outage planning and timing

Under these proposals:

- The ISO will manage a centralised outage coordination process.
- 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 plans must be submitted as soon as practicable, and for regular maintenance - no later than a year in advance.
- 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.
- 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 in consultation with connected parties, and must approve an outage plan unless doing so would have a material impact on PSSR.
- The ISO must assess outage plans, and approve or reject them within two weeks of receipt.
- If the ISO rejects a proposed outage plan, it must assist the proposer to re-submit an acceptable outage plan.
- ISO decisions (including decisions to include equipment on the outage planning list) can be disputed.
- The ISO can only withdraw approval for a previously approved outage plan if there is a risk to PSSR, 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. The cost of compensation will be recovered from ISO fee payers.

3.10.1 Dependencies and triggers

None.

3.10.2 Actions

ID	Action	Owner	Start date	End date
15	Develop and consult on outage coordination process, including risk framework	ISO	Q4 2025	Q2 2026
16	Develop criteria for outage equipment list	ISO	Q4 2025	Q2 2026
17	Develop procedure to help participants identify outage impacts	ISO	Q4 2025	Q2 2026
33	Rule change to introduce outage coordination by ISO	EPWA		Q4 2026

3.11 ISO fees

Under this proposal:

- If an ISO cost is clearly attributable to an individual participant (initially connection activities and registration processing), it will be recovered via charges to the individual participant.
- All other ISO costs will be recovered from all connected participants based on gross injection and withdrawal volumes into and from the NWIS.
- ISO fees for any given fee payer will be capped at 33.3% of the total ISO fees.
- Registration and metering provisions will be revised to ensure that all parties injecting to or withdrawing from the NWIS can be allocated a portion of fees.

3.11.1 Dependencies and triggers

ISO fee recovery arrangements need to change once the ISO governance changes have been implemented (action 2).

3.11.2 Actions

ID	Action	Owner	Start date	End date
18	Detailed design of ISO fees calculations	EPWA	Q4 2025	Q2 2026
20	Rule changes to implement new ISO fees arrangements	EPWA		Q2 2026

3.12 Information

Under this proposal:

- 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).

- Information providers can request that information provided to the ISO be treated as confidential, and provide supporting reasons. The ISO must determine whether the information meets the 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.

3.12.1 Dependencies and triggers

Changes to the information management framework are required to support the planning processes (action 22).

3.12.2 Actions

ID	Action	Owner	Start date	End date
19	Detailed design of information management	EPWA	Q1 2026	Q2 2026
22	Rule changes to implement new information management framework	EPWA		Q2 2026

3.13 Compliance enforcement

Under this proposal:

- The ISO will be able to issue formal warnings and requests for non-compliant parties to return to compliant operation.
- The ISO will be required to refer non-compliance to the ERA for investigation.
- The ERA will commence proactive compliance monitoring.
- The ERA will be able to levy monetary penalties (civil penalties) for non-compliance, with civil penalty provisions prescribed in the Pilbara Networks Regulations.
- Disconnection will remain as a sanction of last resort.

3.13.1 Dependencies and triggers

None.

3.13.2 Actions

ID	Action	Owner	Start date	End date
27	Detailed design for new compliance monitoring and enforcement mechanisms	EPWA	Q1 2026	Q3 2026
31	Rule change to introduce enhanced compliance monitoring and enforcement mechanisms	EPWA		Q4 2026

3.14 Manual load shedding

Under this proposal:

- Participants must use best endeavours to manage their portfolios to balance their consumption and supply.
- The ISO must endeavour 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.
- In preparing the priority list, the ISO must:
  - Ensure that essential (e.g. medically dependent) customers are given priority over other users. This may also require priority for feeders servicing residential consumers, more generally.
  - If practical, ensure that consumption relating to contracted energy volumes and contracted capacity volumes is disconnected later than other consumption.
  - 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.
  - Consult with NSPs and other connected parties to ensure the priority list is practical.

3.14.1 Dependencies and triggers

A structured approach to manual load shedding is required before more sophisticated balancing arrangements can be implemented.

3.14.2 Actions

ID	Action	Owner	Start date	End date
29	Rule change to require ISO to develop manual load shedding priority list	EPWA		Q4 2026
53	Develop and consult on manual load shedding priority list	ISO		Q4 2027
57	Rule changes to require ISO to implement manual load shedding list	EPWA		Q1 2028

3.15 ISO budget

Under this proposal:

- 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.
- ISO's capitalised expenditure will be amortised over time, so that market reform costs are met by new entrants as well as existing connected parties.

3.15.1 Dependencies and triggers

The ISO budget arrangements need to change once the ISO governance changes have been implemented.

3.15.2 Actions

ID	Action	Owner	Start date	End date
30	Rule changes to amend ISO budget arrangements	EPWA		Q4 2026

3.16 NSP to NSP connections

Under this proposal:

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

3.16.1 Dependencies and triggers

None.

3.16.2 Actions

ID	Action	Owner	Start date	End date
37	Detailed design for NSP to NSP interconnections	EPWA	Q2 2026	Q4 2026
38	Rule changes to provide head of power for ISO to manage NSP to NSP interconnections.	EPWA		Q1 2027
42	Develop and consult on procedure for NSP to NSP interconnections.	ISO	Q3 2026	Q2 2027

3.17 Treatment of foundation transmission customers in case of network or supply constraints

Under this proposal:

- The 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.
- Under the current balancing and dispatch arrangements, network constraints resulting in generation curtailment will be resolved by giving priority to generation owned by foundation customers.
- When more sophisticated balancing arrangements are introduced, all generators will be subject to constrained dispatch. Foundation customers of transmission infrastructure will be settled without imbalance penalties if their dedicated generation is constrained after trading positions are finalised.

3.17.1 Dependencies and triggers

Currently, with connected parties required to balance their own portfolios, there is limited potential for the ISO to adjust dispatch in order to meet demand for individual parties. Such treatment can only be implemented with a more sophisticated balancing mechanism (action 77).

3.17.2 Actions

ID	Action	Owner	Start date	End date
39	Detailed design of treatment of foundation transmission customers in case of network constraints	EPWA	Q3 2026	Q2 2027
41	Rule change to implement treatment of foundation transmission customers in case of network constraints.	EPWA		Q2 2027

3.18 System strength

Under this proposal:

- The HTR will provide guidance on the setting of the minimum and maximum fault levels in regions of 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.

3.18.1 Dependencies and triggers

None.

3.18.2 Actions

ID	Action	Owner	Start date	End date
44	Develop fault level requirements for the NWIS	ISO/NSPs	Q1 2027	Q3 2027
48	Rule changes to amend HTRs to specify fault level requirements	ISO		Q4 2027

3.19 Self-contained networks

Under this proposal:

- 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 and at the same site.
- Network operators who use their network equipment solely to service their own co-located 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 relevant equipment within the network), as long as their injection to the NWIS is generally less than 10MW.
- 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 modelling studies, standing data, and real-time data for individual pieces of equipment which could affect PSSR, even if their facilities are subject to Connection Point Compliance.

3.19.1 Dependencies and triggers

None.

3.19.2 Actions

ID	Action	Owner	Start date	End date
4	Rule changes to remove requirement for parties seeking connection to be non-compliant with HTR in order to gain status as a Connection Point Compliance (CPC) facility.	EPWA		Q4 2025
45	Detailed design for new self-contained network arrangements	EPWA	Q3 2026	Q3 2027
49	Rule changes to implement new self-contained network arrangements	EPWA		Q4 2027

3.20 HTR negotiation framework

Under this proposal:

- NSPs must negotiate with connection applicants and consult with the ISO on requested departures from the default standard. 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 they are responsible for.
- NSPs and connection applicants can escalate disputes to the ISO and, if 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).

3.20.1 Dependencies and triggers

A minimum standard cannot reasonably be put in place until the default standard has been operational for some time (action 3).

3.20.2 Actions

ID	Action	Owner	Start date	End date
47	Detailed design for HTR negotiation framework	EPWA	Q1 2027	Q3 2027
52	Rule changes to introduce HTR negotiation framework	EPWA		Q4 2027

3.21 Demand side participation

Under this proposal:

- When flexible loads emerge in the NWIS, balancing and ESS provisions will be revisited to ensure that flexible load can take advantage of providing services to the market.
- Participants with 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 generation or storage capacity.
- When the trading mechanism is introduced, owners of flexible loads can bid to purchase additional energy or sell withdrawal reductions, and then manage their load to match their position.

3.21.1 Dependencies and triggers

Special arrangements for flexible load are not required while there is limited flexible load connected to the NWIS. Demand side participation should be enabled when there is at least 100 MW of flexible load connected. Demand side participation requires accurate and timely meter data, which means action 7 needs to be implemented ahead of additional demand side participation.

3.21.2 Actions

ID	Action	Owner	Start date	End date
43	Detailed design for provision of Contingency Reserve Raise by loads.	EPWA	Q1 2027	Q2 2027
50	Rule changes to allow flexible loads to provide Contingency Reserve Raise	EPWA		Q4 2027
74	Detailed design of loads participation in capacity certification, balancing, and trading arrangements.	EPWA	Q3 2030	Q1 2031
75	Rule changes to enable flexible load inclusion in capacity certification, balancing, and trading arrangements.	EPWA		Q2 2031

3.22 Capacity forecasting

Under this proposal:

- The ISO will forecast capacity requirements for the NWIS, based on the capacity needed to avoid a prescribed level of 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.

3.22.1 Dependencies and triggers

Capacity forecasting is not needed until variable renewable generation increases to a certain level. Capacity forecasting will build on long term planning (action 56).

Capacity forecasting needs to be in place before capacity requirements (action 69) and capacity certification (action 72) commence.

In order for it to be in place in time for the capacity adequacy processes, EPWA proposes a trigger of either 5 years before the projected commencement of a new balancing mechanism (as

discussed in section 2.3.2), or when variable renewable generation is supplying 10% of energy on the NWIS, whichever is later.

3.22.2 Actions

ID	Action	Owner	Start date	End date
55	Detailed design of capacity forecasting process	EPWA	Q2 2027	Q4 2027
58	Rule changes to require ISO to produce capacity forecasts	EPWA		Q2 2028
61	Produce first capacity forecast	ISO		Q4 2028

3.23 Individual capacity requirements

Under this proposal:

- The ISO will set the method for participants to calculate their required contribution to the system capacity requirement, which will include a margin for ESS.
- Participants will be required to have sufficient capacity to meet their individual capacity requirement.
- Participants can nominate part of their demand as non-firm, to be excluded from their firm capacity requirement.
- Participants do not have to account for consumption served by co-located generation.
- The final NWIS capacity target will be the sum of the individual participant requirements.

3.23.1 Dependencies and triggers

Individual capacity requirements can be implemented once capacity forecasting (action 55) is in place.

Individual capacity requirements need to be in place before backup capacity procurement (action 70) can proceed.

Once individual capacity requirements are introduced, additional compliance monitoring will be required (action 80).

3.23.2 Actions

ID	Action	Owner	Start date	End date
62	Detailed design for determining individual capacity requirements	EPWA	Q1 2029	Q4 2029
65	Rule changes to introduce individual capacity requirements	EPWA		Q1 2030
66	Develop, consult on, and publish method for determining individual capacity requirements	ISO		Q2 2030
69	Commence determination of capacity requirements	Connected parties		Q3 2030
71	Review and approve individual capacity requirements	ISO		Q4 2030

3.24 Capacity certification

Under this proposal:

- A participant can self-certify the capacity contribution of its own facilities if:
  - energy from the facility will be used to serve the participant's own consumption, and
  - this supply will not be affected by network constraints.
- consumption served by co-located generation must be included in the participant capacity target, in order for the co-located generation to 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 source for charging.
- All capacity certification methods will be transparent, with as much data as possible provided to participants and publicly so affected parties can check the ISO's assessment.

3.24.1 Dependencies and triggers

Capacity certification can be implemented once capacity forecasting (action 55) is in place.

Capacity certification needs to be in place before backup capacity procurement (action 70) can proceed.

3.24.2 Actions

ID	Action	Owner	Start date	End date
63	Detailed design for capacity certification	EPWA	Q1 2029	Q4 2029
64	Rule changes to introduce capacity certification	EPWA		Q1 2030
67	Develop, consult on, and publish capacity certification procedure	ISO	Q1 2030	Q2 2030
72	Certify capacity	Capacity providers, ISO	Q3 2030	Q4 2030

3.25 Backup capacity procurement

Under this proposal:

- If there is a shortfall of capacity (i.e. some participants do not present evidence of sufficient capacity to meet their individual capacity 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 a published procedure.
- The costs of capacity procured by the ISO will be allocated to the participants with individual certified capacity shortfalls. Self-sufficient participants will not bear any costs of backup capacity procurement.

3.25.1 Dependencies and triggers

Backup capacity procurement is not needed until variable renewable generation increases to a certain level, and a material portion of load is not served by its own generation. As discussed in section 2.3, EPWA proposes a trigger of either one year ahead of projected commencement of new balancing arrangements, or when 10% of energy is served by non-vertically integrated parties, whichever is later.

Backup capacity procurement can be implemented once capacity requirements (action 69) and capacity certification (action 64) are in place.

3.25.2 Actions

ID	Action	Owner	Start date	End date
70	Detailed design of backup capacity procurement	EPWA	Q1 2030	Q3 2030
73	Rule changes to require ISO to procure backup capacity in certain circumstances	EPWA		Q1 2031
76	First potential capacity procurement	ISO		Q2 2032

3.26 Balancing and trading

Under this proposal:

- The ISO will continue to balance the system using ESS until variable renewable generation increases to a certain level.
- At some future time, yet to be determined, the ISO will manage a more dynamic balancing arrangement, in which some facilities can receive balancing instructions.
- A central trading mechanism may be introduced at the same time, if needed.

3.26.1 Dependencies and triggers

More sophisticated balancing arrangements are not needed until variable renewable penetration increases. As discussed in section 2.3, EPWA proposes that arrangements are commenced when:

- Variable renewable generation supply 20% of all energy on the NWIS; and either
- At least 750 MW of variable renewable generation capacity is connected to the NWIS; or
- ESS costs double from 2025 values.

Both the balancing and the trading mechanisms would need individual capacity requirements and capacity certification to be in place, as successful proponents in the backup capacity procurement mechanism would have balancing responsibilities.

If new balancing arrangements are introduced, transmission foundation customers will have priority rights for the use of network capacity they have funded (action 79).

If a new balancing mechanism is introduced, additional compliance monitoring will be required (action 80).

3.26.2 Actions

ID	Action	Owner	Start date	End date
77	Detailed design of balancing mechanism	EPWA	Q1 2030	Q3 2032
78	Detailed design for trading mechanism	EPWA	Q1 2030	Q3 2032
79	Rule changes to introduce balancing mechanism	EPWA		2033

81	Rule changes to introduce trading mechanism	EPWA		2033

3.27 Compliance monitoring

Under this proposal:

- The ISO will monitor participant compliance with the PNR, including the HTR.
- Initial focus areas for ISO monitoring will be outages (planned and unplanned), portfolio balancing, dispatch compliance and ESS performance.
- The ISO will publish quarterly compliance reports on the activities it monitors.
- The ISO will report suspected no-compliances to the ERA.
- The ERA will monitor market behaviour, with additional focus required from the start of the balancing market.

3.27.1 Dependencies and triggers

When capacity requirements (action 65) and a more sophisticated balancing approach (action 79) are introduced, they will drive a need for additional compliance monitoring.

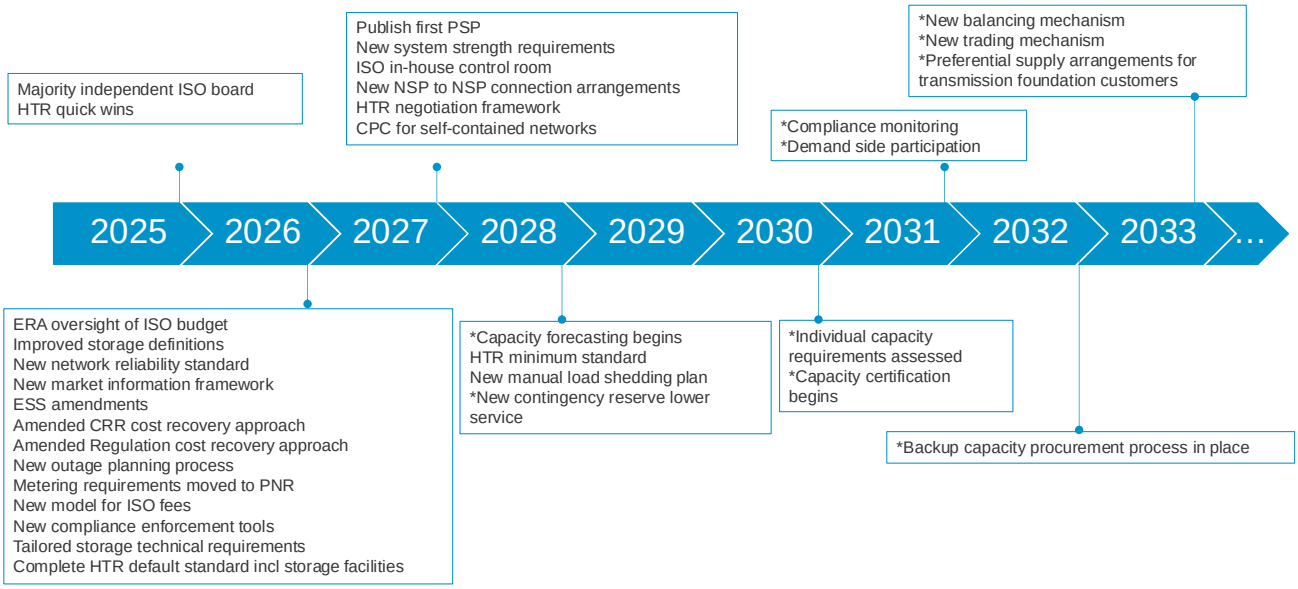
3.27.2 Actions

ID	Action	Owner	Start date	End date
32	Start monitoring ESS providers performance	ISO		Q4 2026
68	Develop and implement monitoring for compliance with individual capacity requirements	ISO		Q3 2030
80	Develop and implement monitoring of dispatch compliance	ISO		2033

4. Implementation activities by year

This chapter presents implementation activity for each year of the plan, as summarised in Figure 5.

Figure 5: Implementation timeline



4.1 2025

Changes in 2025 focus on ISO governance and completing the HTR default standard. Some design activities commence, to be completed in 2026. Figure 6 shows the current functions of the ISO.

Figure 6: ISO functions as at December 2025

Table 2: EPNR implementation activity in 2025

ID	Action	Owner	Estimated start date	Estimated end date
1	Finalise proposed ISO governance, including board composition, nomination & appointment process.	EPWA		Q4 2025
2	Introduce majority independent ISO board	EPWA		Q4 2025
3	Rule changes to implement the PAC HTR working group recommendations to complete default standard.	EPWA		Q4 2025
4	Rule changes to remove requirement for parties seeking connection to be non-compliant with HTR in order to gain status as a Connection Point Compliance (CPC) facility.	EPWA		Q4 2025

4.2 2026

2026 includes design activity and commencement for a range of initiatives. The ISO will pick up outage coordination functions, and start monitoring compliance of ESS providers as shown in Figure 7.

Figure 7: ISO functions as at December 2026

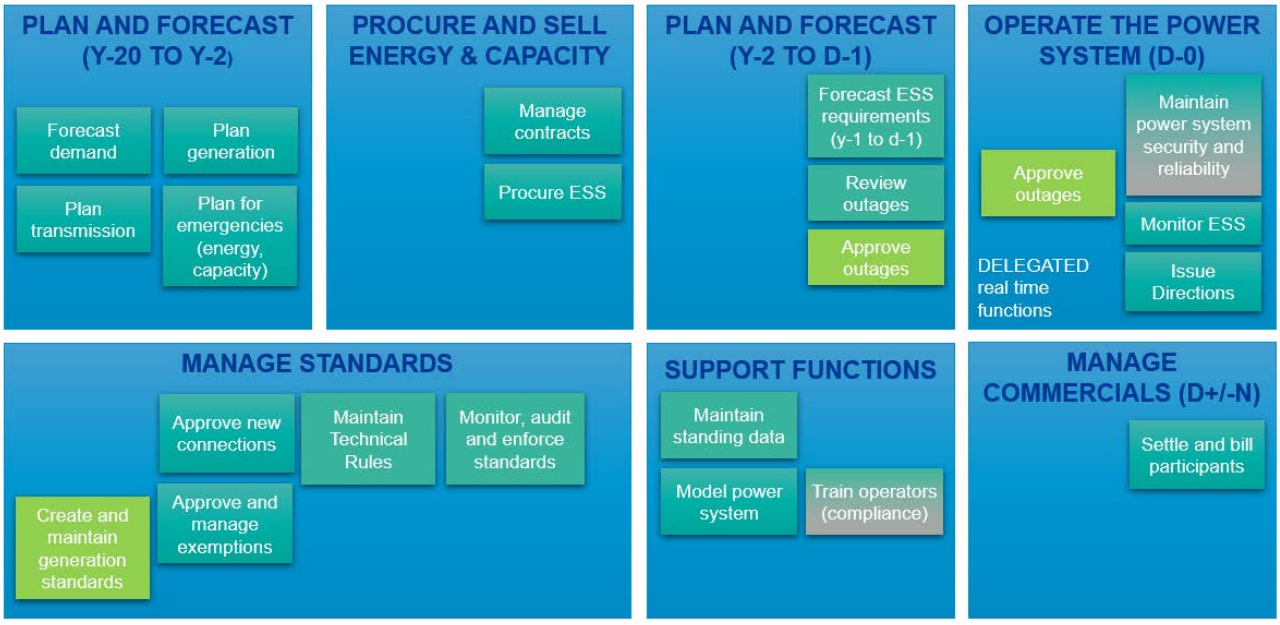


Table 3: EPNR implementation activities in 2026

ID	Action	Owner	Estimated start date	Estimated end date
5	Rule changes to rename existing services	EPWA		Q1 2026
6	Rule change to implement runway method for Contingency Reserve Raise (CRR) services cost recovery	EPWA		Q1 2026
7	Rule changes to move meter data content and timing into PNR	EPWA		Q1 2026
8	Rule changes to introduce “Energy Producing System” to PNR, so that storage is adequately covered.	EPWA		Q1 2026
9	Network Services Providers (NSPs) to retire their technical standards, to ensure that the HTR is the common set of technical standards for access and connection in the NWIS.	NSPs		Q1 2026
10	Rule changes to require ISO to publish the annual Pilbara System Plan (PSP) and the Coordinator to publish an integrated System Plan for the NWIS (akin to Whole of System Plan for the South West Interconnected System)	EPWA		Q2 2026
11	Develop project plan to bring control desk in-house	ISO	Q4 2025	Q2 2026
12	Detailed design for Regulation services cost recovery	EPWA	Q4 2025	Q2 2026
13	Develop and publish interpretation guidance for the network planning standard	EPWA/ISO	Q4 2025	Q2 2026
14	Develop new ESS procurement procedure, to include dynamic and locational ESS requirements.	ISO		Q2 2026
15	Develop and consult on outage coordination process, including risk framework	ISO	Q4 2025	Q2 2026
16	Develop criteria for outage equipment list	ISO	Q4 2025	Q2 2026
17	Develop procedure to help participants identify outage impacts	ISO	Q4 2025	Q2 2026
18	Detailed design of ISO fees calculations	EPWA	Q4 2025	Q2 2026
19	Detailed design of information management	EPWA	Q1 2026	Q2 2026
20	Rule changes to implement new ISO fees arrangements	EPWA		Q2 2026
21	Rule changes to require additional meter data if needed for ISO fees	EPWA		Q2 2026
22	Rule changes to implement new information management framework	EPWA		Q2 2026

23	Rule changes to implement network planning reliability standard	EPWA		Q3 2026
24	Rule changes to implement new Regulation services cost recovery method	EPWA		Q3 2026
25	Rule changes to provide for establishment of HTR minimum standard.	EPWA		Q3 2026
26	Develop and consult on an ESS accreditation framework procedure	ISO		Q3 2026
27	Detailed design for new compliance monitoring and enforcement mechanisms	EPWA	Q1 2026	Q3 2026
28	Development of technical standards for storage	ISO	Q1 2026	Q3 2026
29	Rule change to require ISO to develop manual load shedding priority list	EPWA		Q4 2026
30	Rule changes to amend ISO budget arrangements	EPWA		Q4 2026
31	Rule change to introduce enhanced compliance monitoring and enforcement mechanisms	EPWA		Q4 2026
32	Start monitoring ESS providers performance	ISO		Q4 2026
33	Rule change to introduce ISO outage coordination by ISO	EPWA		Q4 2026
34	Rule change to introduce technical standards for storage into HTR	EPWA		Q4 2026
35	Conduct power system studies to assess RoCoF ride through capability of existing equipment	ISO		Q4 2026
36	Develop and consult on ISO PSP procedure	ISO	Q3 2026	Q4 2026
37	Detailed design for NSP to NSP interconnections	EPWA	Q2 2026	Q4 2026

4.3 2027

In 2027, a number of activities, that are not subject to trigger conditions, are completed. The ISO takes over control desk functions, as shown in Figure 8.

Figure 8: ISO functions as at December 2027

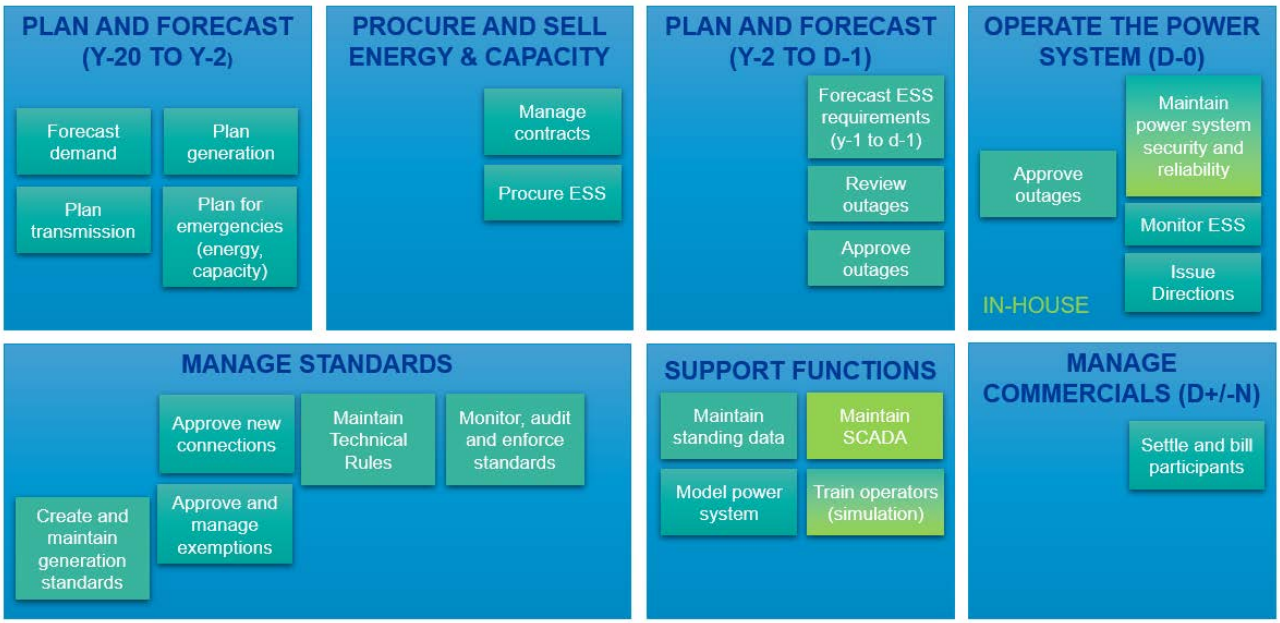


Table 4: EPNR implementation activities in 2027

ID	Action	Owner	Estimated start date	Estimated end date
38	Rule changes to provide head of power for ISO to manage NSP to NSP interconnections.	EPWA		Q1 2027
39	Detailed design of treatment of foundation transmission customers in case of network constraints	EPWA	Q3 2026	Q2 2027
40	Prepare and publish first PSP	ISO		Q2 2027
41	Rule change to implement treatment of foundation transmission customers in case of network or supply constraints	EPWA		Q2 2027
42	Develop and consult on procedure for NSP to NSP interconnections.	ISO	Q3 2026	Q2 2027
43	Detailed design for provision of Contingency Reserve Raise by loads.	EPWA	Q1 2027	Q2 2027
44	Develop fault level requirements for the NWIS	ISO/NSPs	Q1 2027	Q3 2027
45	Detailed design for new self-contained network arrangements	EPWA	Q3 2026	Q3 2027
46	Develop minimum HTR standard for connection to the NWIS	EPWA	Q4 2026	Q3 2027
47	Detailed design for HTR negotiation framework	EPWA	Q1 2027	Q3 2027

48	Rule changes to amend HTRs to specify fault level requirements	ISO		Q4 2027
49	Rule changes to implement new self-contained network arrangements	EPWA		Q4 2027
50	Rule changes to allow flexible loads to provide Contingency Reserve Raise	EPWA		Q4 2027
51	Rule changes to implement minimum connection standard in the HTR.	EPWA		Q4 2027
52	Rule changes to introduce HTR negotiation framework	EPWA		Q4 2027
53	Develop and consult on manual load shedding priority list	ISO		Q4 2027
54	ISO takes over control desk operations	ISO		Q4 2027
55	Detailed design of capacity forecasting process	EPWA	Q2 2027	Q4 2027
56	Coordinator prepares and publishes integrated System Plan for the NWIS	Coordinator		Q4 2027

4.4 2028-30

From 2028 onwards, timing of activities depends on changes in the power system. If the trigger conditions occur, additional reform activities will be initiated. If the characteristics of the supply fleet do not change, i.e. triggers are not met, these changes will be implemented later accordingly. If the former, the ISO takes responsibility for capacity related functions as shown in Figure 9.

Figure 9: ISO functions with capacity certification (estimated December 2030)

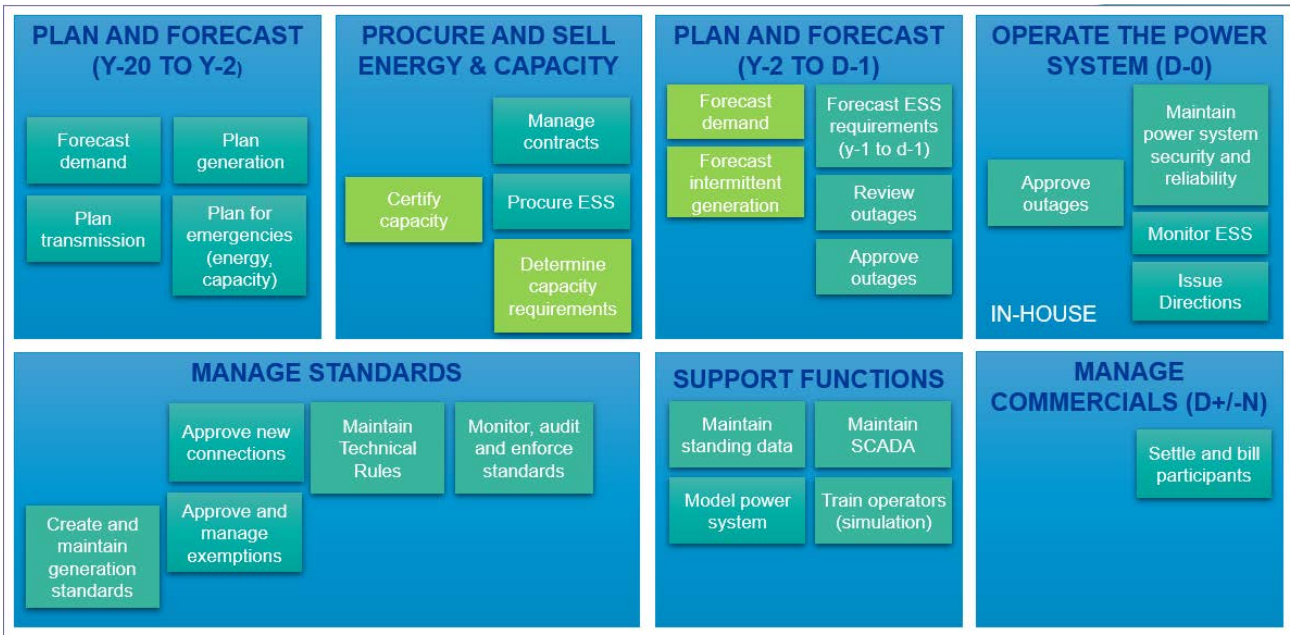


Table 5: Expected EPNR implementation activities 2028-2030

ID	Action	Owner	Estimated start date	Estimated end date
57	Rule changes to require ISO to implement manual load shedding list	EPWA		Q1 2028
58	Rule changes to require ISO to produce capacity forecasts	EPWA		Q2 2028
59	Rule change to introduce Contingency Reserve Lower (CRL) service	EPWA		Q4 2028
60	Rule changes to implement CRL cost recovery	EPWA		Q4 2028
61	Produce first capacity forecast	ISO		Q4 2028
62	Detailed design for determining individual capacity requirements	EPWA	Q1 2029	Q4 2029
63	Detailed design for capacity certification	EPWA	Q1 2029	Q4 2029
64	Rule changes to introduce capacity certification	EPWA		Q1 2030
65	Rule changes to introduce individual capacity requirements	EPWA		Q1 2030
66	Develop, consult on, and publish method for determining individual capacity requirements	ISO		Q2 2030
67	Develop, consult on, and publish capacity certification procedure	ISO	Q1 2030	Q2 2030
68	Develop and implement monitoring for compliance with individual capacity requirements	ISO		Q3 2030
69	Commence determination of capacity requirements	Connected parties		Q3 2030
70	Detailed design of backup capacity procurement	EPWA	Q1 2030	Q3 2030
71	Review and approve individual capacity requirements	ISO		Q4 2030
72	Certify capacity	Capacity providers, ISO	Q3 2030	Q4 2030

4.5 After 2030

Once the renewable generation triggers are met, and the predecessor initiatives have been implemented, the ISO will take on responsibility for backup capacity procurement, a real-time balancing mechanism, and potentially a trading mechanism as shown in Figure 10.

Figure 10: ISO functions with full EPNR implementation

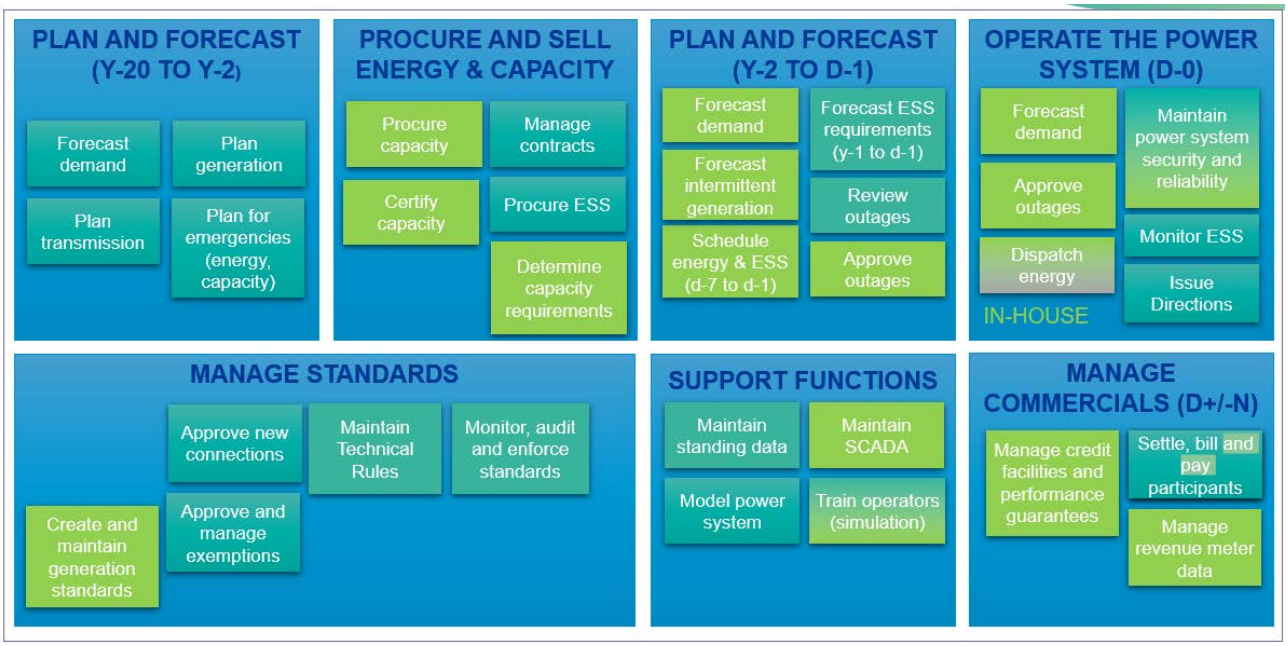


Table 6: Expected EPNR implementation activity post-2030

ID	Action	Owner	Estimated start date	Estimated end date
73	Rule changes to require ISO to procure backup capacity in certain circumstances	EPWA		Q1 2031
74	Detailed design of loads participation in capacity certification, balancing, and trading arrangements.	EPWA	Q3 2030	Q1 2031
75	Rule changes to enable flexible load inclusion in capacity certification, balancing, and trading arrangements.	EPWA		Q2 2031
76	First potential capacity procurement	ISO		Q2 2032
77	Detailed design of balancing mechanism	EPWA	Q1 2030	Q3 2032
78	Detailed design for trading mechanism	EPWA	Q1 2030	Q3 2032
79	Rule changes to introduce balancing mechanism	EPWA		2033
80	Develop and implement monitoring of dispatch compliance	ISO		2033
81	Rule changes to introduce trading mechanism	EPWA		2033

4.6 Consultation questions

1. Do stakeholders agree with the proposed implementation activities? If not, how should the activities be amended, and why?
2. Do stakeholders support the proposed responsibility for implementation activities? If not, how should these responsibilities be amended and why?
3. Do stakeholders support the proposed timing and sequencing of implementation activities? If not, how should the plan be amended and why?
4. Do stakeholders agree with the proposed trigger conditions for introducing new market components? If not, what trigger conditions should be used instead, and why?

When providing feedback, please reference specific action numbers to which the feedback relates.

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