

## Meeting Agenda

<b>Meeting Title:</b>	Pilbara Advisory Committee ( <b>PAC</b> )
<b>Date:</b>	Thursday 18 April 2024
<b>Time:</b>	9:30 AM – 11:00 AM
<b>Location:</b>	Online, via TEAMS.

Item	Item	Responsibility	Type	Duration
1	Welcome and Agenda	Chair	Noting	2 min
2	Meeting Apologies/Attendance	Chair	Noting	1 min
3	Competition Law Statement	Chair	Noting	1 min
4	Minutes			
	(a) Minutes of Meeting 2024_02_29	Chair	Noting – already approved	1 min
5	Action Items	Chair	Noting	2 min
6	Evolution of the Pilbara Networks Rules Project (EPNR) Working Group Update (a) Planned approach to EPNRWG (b) Modelling approach and next steps	WG Chair	Discussion	50 mins
7	Harmonised Technical Rules Issues and Gaps List	WG Chair	Discussion	30 mins
8	General Business	Chair	Discussion	3 min
	Next meeting: 9:30 AM, 20 June 2024			

Please note, this meeting will be recorded.

## Competition and Consumer Law Obligations

Members of the Pilbara Advisory Committee (**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.

## Minutes

<b>Meeting Title:</b>	Pilbara Advisory Committee (PAC)
<b>Date:</b>	29 February 2024
<b>Time:</b>	9:30 AM – 11:00 AM
<b>Location:</b>	Online, via TEAMS

Attendees	Class	Comment
Sally McMahon	Chair	
James Campbell- Everden	Independent System Operator (ISO)	
Anthony Ravi	Registered Network Service Provider (NSP)	
Sandy Morgan	Registered NSP	
Rebecca White	Excluded NSP Representative	
Neil Midolo	Excluded NSP	
Gabby Pracilio	Contestable Customer	
Rory Burn	Discretionary Rule Participant	
Bethwyn Cowcher	Discretionary Rule Participant	
Kristian Myhre	Discretionary Rule Participant	
Noel Ryan	Observer appointed by the Minister	
Frances Hobday	ERA (Observer)	

Also in Attendance	From	Comment
Dora Guzeleva	PAC Secretariat	Observer
Isadora Salviano	PAC Secretariat	Observer
Tom Coates	PAC Secretariat	Observer

Apologies	From	Comment
Analena Gilhome	Small-Use Consumer	
Sandra McInnes	Contestable Customer	
Momcilo Andric	Registered NSP	No apologies received
Anne Taylor	Excluded NSP Representative	No apologies received

Item	Subject	Action
1	<p><b>Welcome</b></p> <p>The Chair opened the meeting with an Acknowledgement of Country.</p> <p>The Chair disclosed to members her roles as Commissioner on the Australian Energy Market Commission (AEMC), Independent Chair of the Market Advisory Committee, Independent Chair of the Gas Advisory Board and part-time Counselor at the National Competition Council.</p> <p>The Chair noted that the views or advice provided by the PAC to the Coordinator do not necessarily represent the views of the independent Chair.</p> <p>The Chair advised that the PAC meeting was being recorded for the purposes of developing the minutes.</p>	
2	<p><b>Meeting Apologies/Attendance</b></p> <p>The Chair noted the attendance and apologies as listed above.</p> <p>The Chair welcomed new members appointed following the 2024 Biennial PAC Composition Review.</p>	
3	<p><b>Competition Law Statement</b></p> <p>The Chair noted the Competition Law Statement and reminded members of their obligations and encouraged them to bring any Competition Law issues to her attention as they may arise.</p>	
4	<p><b>Minutes</b></p> <p><b>(a) Minutes of Meeting 2023_09_21</b></p> <p>The PAC noted the minutes of the 21 September 2023 PAC meeting. The PAC had approved those minutes previously.</p>	
5	<p><b>Action Items</b></p> <p>The closed action items were taken as read.</p>	
6	<p><b>Evolution of the Pilbara Networks Rules (EPNR) Project</b></p> <p>The Chair opened the discussion on the agenda item regarding the PAC's consideration to form a working group to support the EPNR Project and the draft terms of reference for the working group.</p> <p>Ms Guzeleva introduced the EPNR Project and outlined that its purpose is for stakeholders and government to consider how the current PNR may need to evolve to enable the decarbonisation of the NWIS and the Pilbara, while ensuring the policy trilemma in the State Electricity Objective (security and reliability, cost to consumers and environmental impact) is met.</p> <p>Ms Guzeleva invited members to ask questions or provide feedback on the project scope (noting that the scope has been approved by the Coordinator). The following was discussed:</p>	

Item	Subject	Action
	<ul style="list-style-type: none"> <li>Ms Morgan questioned if outcomes of the EPNR, in regard to its cost-effectiveness objective, will be linked to the work of the Pilbara Networks Access Code (PNAC).</li> </ul> <p>Ms Guzeleva explained that the EPNR and the work on the PNAC are expected to be progressed independently, but both will be guided by the overarching State Electricity Objective and will be discussed internally for alignment.</p> <ul style="list-style-type: none"> <li>Ms Morgan noted that the EPNR Working Group includes a Harmonised Technical Rules (HTR) workstream. Ms Morgan questioned if the EPNR and the PNAC work related to the HTR will be aligned.</li> </ul> <p>Ms Guzeleva acknowledged that the EPNR and the PNAC work should be aligned to avoid duplicated technical requirements. Ms Guzeleva explained that EPWA considered bringing the PNR and PNAC reviews together but did not select the option on the basis that the PAC is a statutory group established under the PNR, to address PNR matters.</p> <p>Ms Guzeleva introduced the draft terms of reference circulated to members and provided an overview of the working group's two distinct workstreams:</p> <ul style="list-style-type: none"> <li>EPNR Project Delivery ('Workstream 1'), which will include scenario development and modelling to inform a detailed review and assessment of the PNR; and</li> <li>Evolution and Development of the HTR ('Workstream 2'), which will focus specifically on identifying issues and gaps in the HTR.</li> </ul> <p>Ms Guzeleva noted that members of the proposed EPNRWG can choose to participate in one workstream or both. Ms Guzeleva advised that the HTR Workstream 2 will be technical and members should have the relevant technical knowledge.</p> <p>Ms Guzeleva advised members that EPWA has engaged Robinson Bowmarker Paul (RBP) to provide consultancy services to support the scenario modeling and analysis of the PNR.</p> <p>The Chair identified two threshold questions for the PAC to consider. Firstly, whether to approve the establishment of a working group and, if yes, secondly to review the draft terms of reference provided.</p> <ul style="list-style-type: none"> <li>The PAC members supported the establishment of the Working Group and the Chair invited members to discuss and provide feedback on the draft terms of reference.</li> <li>Ms Cowcher noted that EPWA has previously modeled different scenarios and trajectories for the Pilbara Industry Roundtable. Ms Cowcher questioned: <ul style="list-style-type: none"> <li>whether those scenarios would be used in the EPNR modelling; and</li> </ul> </li> </ul>	

Item	Subject	Action
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- how can the EPNR working group be able to effectively progress the development of the HTR in a timely matter, and not be held up by the modelling work.

Ms Guzeleva acknowledged the earlier modelling work undertaken in the Roundtable process and confirmed that EPWA intends to refresh that model in due course.

Ms Guzeleva indicated that the EPNR modelling will not repeat or refresh the previous modelling but will leverage the input assumptions and scenarios from that established model as a starting point.

Ms Guzeleva noted that, while that the roundtable modelling focused on the evolution of the generation, storage and transmission network requirements to accommodate the penetration of renewable generation, it was not a dispatch model. The modelling in the EPNR project will focus on providing insights relevant to an assessment of the PNR, such as whether the obligation to load follow and other existing mechanisms would remain fit for purpose at various levels of renewable energy penetration.

Ms Guzeleva confirmed that the project is structured to deliver the two workstreams in parallel, and that the HTR work will not be delayed by the modelling exercise. Ms Guzeleva noted that the HTR workstream will rely heavily on the industry to inform the HTR work program and provide technical expertise.

- Ms White sought clarification on the scope of the project and queried whether there has been a decision that the PNR will evolve.

Ms Guzeleva clarified that EPWA is not saying that anything needs to be done to evolve the existing market, at this stage.

Ms Guzeleva noted that there are clear gaps around the participation of renewables and the context of the project is to look into whether the current mechanisms efficiently support the Pilbara decarbonisation trajectory. For that reason, the first course of action is to develop scenario modelling to assess if the rules are fit for purpose.

- Ms White sought clarification whether stakeholders should expect as an outcome of this project that the existing market framework will remain the same or if it will evolve to a more robust market, such as the WEM.

Ms Guzeleva clarified that the modelling exercise will provide insights into how the existing PNR arrangements perform at various levels of renewable energy penetration and inform a review of the PNR and an assessment of its performance against the State Electricity Objective.

- Ms Morgan questioned whether a consultant will be engaged or if the HTR workstream is relying only on industry contributions.

Item	Subject	Action
	<p>Ms Guzeleva clarified that the EPNR project consultant will provide support to the HTR workstream. However, industry members of the HTR workstream will be expected to identify HTR issues and gaps, and provide technical input to develop options to resolve these.</p> <ul style="list-style-type: none"> <li>Ms Morgan acknowledged that industry will have the technical expertise for this, but queried whether stakeholders may have diverging views that may slow the process.</li> </ul> <p>Ms Guzeleva recognised that stakeholders may not agree and consensus may not be achieved in the working group meetings. It will be EPWA's role, supported by the consultant, to collate these views and convey them to the PAC.</p> <ul style="list-style-type: none"> <li>Mr Burn questioned whether the PAC will have a chance to review the demand assumptions to be used in the modelling before it is incorporated into the model.</li> </ul> <p>Ms Guzeleva agreed that the demand assumptions are a key component of the scenarios development and agreed that demand assumptions used previously should be updated where new information is available.</p> <p>Ms Guzeleva observed that for this modelling, while demand assumptions will be important for the scenarios development, given the focus of this is on PNR insights, rather than transmission and generation build, an indicative level of renewable energy penetration will be more important to the assessment.</p> <ul style="list-style-type: none"> <li>Ms Morgan questioned how critical land issues will be integrated into the modelling and in the market analysis. Ms Morgan expressed her concern that land issues are a barrier for renewables, and queried the relevance of the modelling if land issues prevent development.</li> </ul> <p>Ms Guzeleva acknowledged Ms Morgan's concern and responded that the modelling will need to adopt assumptions around land access for renewables and transmission, but land use and social licence issues are out-of-scope for this project, which is focused on the PNR.</p> <p>Ms Guzeleva noted that those issues, and others from last year's Roundtable, are a focus of other EPWA workstreams.</p> <p>The Chair summarised Ms Morgan's feedback that the modelling assumptions should be realistic based on land use planning and other things in the region, as opposed to trying to resolve those land use issues.</p> <ul style="list-style-type: none"> <li>Ms Morgan agreed.</li> </ul> <p>The Chair summarised the discussion, including the questions on modelling, which will be addressed by the working group, and the role of EPWA to manage potentially differing views in the working group.</p>	

Item	Subject	Action
	<p>The Chair asked members whether the discussion required changes to the draft terms of reference.</p> <ul style="list-style-type: none"> <li>Ms Morgan questioned if the terms of reference should address how subject matter experts, the consultant and the Government will make decisions, particularly when there is no consensus, given the short timeframe for completing the review.</li> <li>Ms Cowcher agreed with Ms Morgan and commented that the role of the independent consultant as a mediator enabling SMEs to present their independent views, including dissenting views, and support the government objectives, should be clarified.</li> </ul> <p>Ms Guzeleva acknowledged that members of the working group will have a unique interest in the HTR but noted that all interested parties should aim at the same goal, that is to foster a secure and reliable system at the most efficient cost and facilitating decarbonisation in the Pilbara.</p> <p>Ms Guzeleva explained that EPWA, as the working group's Chair, will make sure that discussions are carried in a timely manner, supported by evidence and without deviating from the objectives. Ms Guzeleva explained that in the event there are insurmountable difficulties or conflicts that cannot be resolved in the working group, the Chair will escalate this to the PAC for resolution.</p> <ul style="list-style-type: none"> <li>Ms Morgan suggested that the terms of reference should specify that when papers are presented to the PAC, all different views should be clearly described, providing they are aligned with the objectives.</li> </ul> <p>Ms Guzeleva agreed that the terms of reference could be amended to reflect that the working group is not a decision-making body, and that consensus is desirable but not required. Minutes and reports to the PAC will capture consensus and differing views as appropriate.</p> <p>The Chair noted that, while the working group is not required to reach consensus, it is important to not overlook the responsibility of working group members to work constructively in considering and seeking to understand diverse views and to establish consensus where possible.</p> <p>The Chair asked Ms Guzeleva to outline the nominations process and timeframes for the working group.</p> <p>Ms Guzeleva explained that EPWA will release a call for nomination on the Coordinator's website and invited PAC members to provide nominations by email to the Energy Markets mailbox, by 8 March 2024.</p> <p><b>Action: EPWA to amend the EPNR Working Group's terms of reference to reflect the PAC discussion.</b></p>	



Item	Subject	Action
	<b>Action: EPWA to circulate email seeking nominations to the EPNR Working Group.</b>	<b>EPWA</b>
7	<p><b>Concept Paper – Essential System Services (ESS) Cost Allocation</b></p> <p>The Chair noted that the PAC was asked to note the issues identified with the cost allocation of ESS, and the ISO’s proposed plan to consult and address these issues.</p> <p>Mr Campbell-Everden provided a summary of the ESS Cost Allocation Concept Paper, including the ISO’s intention to facilitate stakeholder workshops.</p> <ul style="list-style-type: none"> <li>Mr Burn indicated support for this work being done as urgently as possible and asked if there will be a call for nomination for the ISO workshops and, if so, when.</li> </ul> <p>Mr Campbell-Everden explained that the ISO will put a call for nomination forward, which will be circulated broadly by email to ISO stakeholders and published on the ISO website.</p> <ul style="list-style-type: none"> <li>Ms White expressed support for the ISO providing the PAC with early notice of the ISO work program that may result in rule changes, which the PAC will subsequently consider, and noted that this could help bring all stakeholders to a common understanding of how the PNR is evolving.</li> <li>Ms White asked if there will be a consultant involved in this work and, if so, does the ISO already have a consultant assigned.</li> </ul> <p>Mr Campbell-Everden confirmed that a consultant will be engaged but that who they are, and the scope of their engagement has not been determined.</p> <p>Mr Campbell-Everden noted that the ISO has no intention to engage a consultant to draft rules and indicated that rule drafting will need to be discussed further with EPWA.</p> <ul style="list-style-type: none"> <li>Ms White queried if, in developing the ESS cost allocation in the NWIS, the ISO would consider the recent cost allocation work completed for the WEM.</li> </ul> <p>Mr Campbell-Everden noted that the ISO will consider lessons learned in other jurisdictions. Mr Campbell-Everden indicated that the ISO has not formed a view on how relevant the work developed in the WEM is, given that the Pilbara Networks Rules are different from the WEM Rules.</p> <p>Ms Guzeleva noted that the level of complexity in the cost allocation provisions for the WEM may not be needed in the PNR in its current state. However, Ms Guzeleva considered that the WEM cost allocation review will be relevant and can help guide the PNR work.</p> <p>The Chair thanked Mr Campbell-Everden and echoed the sentiment that it is beneficial for the PAC’s collective understanding to receive these updates from the ISO and invited the ISO to continue to use the PAC in this manner.</p>	

Item	Subject	Action
8	<p data-bbox="300 277 552 309"><b>General Business</b></p> <p data-bbox="300 329 1131 394">The Chair noted that the next meeting will be held at 9:30am on Thursday, 18 April 2024.</p> <p data-bbox="300 414 1190 510">The Chair asked participants whether they would like to raise any additional issues or general business. The following comments were made:</p> <ul data-bbox="300 530 1171 981" style="list-style-type: none"> <li data-bbox="300 530 1171 627">• Mr Myhre reflected that, as the reform work progresses, it will be important to consider the unique differences of the Pilbara Networks, relative to other electricity markets.</li> <li data-bbox="300 649 1171 745">• Mr Ravi supported this sentiment, and the importance of the reform proposals reflecting an understanding of why the system was developed in the manner it has.</li> <li data-bbox="300 768 1171 833">• Mr Midolo expressed his interest in getting more clarity on how ESS costs are allocated.</li> <li data-bbox="300 855 1171 981">• Ms Pracilio expressed her interest in the PAC receiving updates around broader policy and regulatory developments in relation to the decarbonisation of the Pilbara, which are important for the PAC context.</li> </ul> <p data-bbox="300 1003 1203 1068">The Chair encouraged participants to add items to the agenda for the next meeting.</p> <p data-bbox="300 1088 692 1117">The Chair closed the meeting.</p>	

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**The meeting closed at 10:57am.**



## Agenda Item 5: PAC Action Items

### Pilbara Advisory Committee (PAC) Meeting 2024\_04\_18

Shaded	Shaded action items are actions that have been completed since the last PAC meeting. Updates from last PAC meeting provided for information in <b>RED</b> .			
Unshaded	Unshaded action items are still being progressed.			
Missing	Action items missing in sequence have been completed from previous meetings and subsequently removed from log.			
Item	Action	Responsibility	Meeting Arising	Status
1/2024	EPWA to amend the Term of Reference to reflect changes proposed by PAC members	EPWA	2024_02_29	<b>Closed</b> EPWA updated the Term of Reference in accordance with the changes proposed by PAC members. Updated Term of Reference was provided to PAC members for noting with the papers for the PAC meeting of 18 April 2024.
2/2024	EPWA to circulate email seeking nominations to the EPNR Working Group	EPWA	2024_02_29	<b>Closed</b> EPWA sent email to PAC members on 29 February 2024 requesting nomination to be provided via email by COB 8 March 2024.



Government of Western Australia  
Energy Policy WA

# Pilbara Advisory Committee

## EPNR Working Group update

18 April 2024

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

# Project workplan – approach

Seek working group input early in each stage, and discuss most items at least twice. Topics:

- Modelling scenarios – setting the scenarios, initial results, final results
- Identifying and prioritising PNR development initiatives – initial list, final list
- Scope and design of each initiative. Discuss design options at one meeting, then present and discuss a preferred option at another meeting
- Implementation plan – likely one meeting only

Final policy package:

- Public consultation paper (all stakeholders invited to provide submissions)
- Submissions inform final policy decisions in a public information paper (with implementation plan)

PAC:

- Updates from Working Group, identifying areas of consensus and contention
- Draft consultation paper
- Draft implementation plan

# 1. Modelling approach

# Purpose of EPNR modelling

The main purpose of the EPNR modelling is to explore the impact of different levels of operational coordination/integration in a number of possible futures.

The focus is on the commercial aspects of the sector – energy exchange and settlement. The goal is not to identify specific transmission or generation projects, it is to assess the size of the system-wide benefit pool. Specifically:

How much new build/curtailment/emissions/unserved energy could be avoided by sharing generation resource/ESS/transmission infrastructure to deliver energy to currently multiple separate or lightly integrated power systems?

If the potential is large, then mechanisms to enable greater sharing should be progressed.

Power system security and reliability requirements are met in all scenarios.

# Comparison to previous modelling

The 2023 modelling:

- focused on potential capacity expansion, network security and reliability
- identified future demand profiles, generation mix, generation location, and transmission expansion options to enable a decarbonised Pilbara electricity sector
- did not focus on commercial structure, market design, or operational feasibility.

This 2024 modelling:

- focuses on commercial, market design, and operational considerations
- applies a detailed dispatch model down to hourly resolution
- uses scenario assumptions developed in 2023 to assess economic implications of different levels of integration.



# Modelling approach

Modelling will use RBP's fundamental dispatch tool (see appendix).

Key items to explore:

- Overall cost to serve
- Different levels of demand growth/renewable penetration
- Different extents of operational integration/coordination
- Potential savings/costs for vertically integrated entities

Key assumptions:

1. Demand growth is taken as a given. Generation will be built to service entity demand and avoid unserved energy.
2. Unconstrained transmission investment – generation location is less important than its quantity.
3. Reuse input data from 2023 modelling where possible, especially demand and generation forecasts.

# Working group discussion

The working group:

- Asked about public material from the 2023 modelling. EPWA referred participants to the 2023 PAC meeting papers.
- Noted that the previous work had placeholders for long duration storage. EPWA confirmed that EPNR modelling would include storage of various durations.
- Wanted to confirm that the EPNR modelling would assess operational profiles – for example CCGTs moving to 2 shift or even more frequent cycling. EPWA confirmed that modelling would include startup/shutdown costs in the dispatch optimisation.
- Noted that participants may judge there to be non-financial benefits from retaining control over their own operations vs participating in a regime with potential liability, but that quantifying this benefit would be difficult. EPWA will consider this further.
- Noted that the reliability standard is a key assumption, may not be the same across all Pilbara networks, and will need to be clearly articulated for the modelling scenarios.

*Does the PAC have any other comments on the modelling approach?*

## 2. Scenarios

# Scenarios

Scenarios will be defined on two dimensions:

- Sectoral drivers: different levels of demand growth and/or renewable penetration
- Market options: different levels of operational integration or coordination

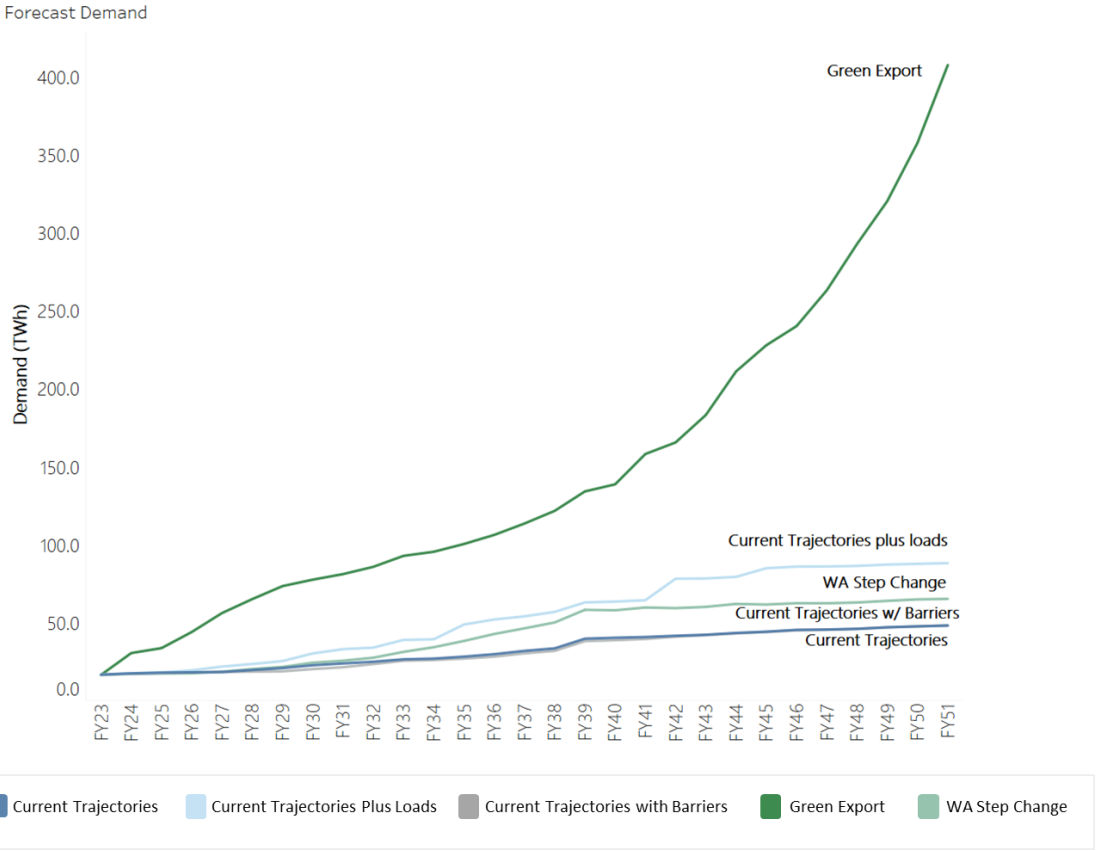
All scenarios will assume:

- increased renewable penetration over time
- power system security and reliability requirements are met.

		Level of Operational Coordination		
		A	B	C
Demand and renewable penetration growth	1	1A	1B	1C
	2	2A	2B	2C
	3	3A	3B	3C

# Key assumptions – sectoral drivers

Proposal: use the CT and CT+ scenarios as basis for demand and renewable penetration scenarios



## Renewable penetration:

- ?% by 2030 (previous modelling 40-60%)
- 80% by 2040
- 95% by 2050

## New build mix:

- 80-100% solar (0-20% wind) until 2030
- Mostly wind in the 2030s
- Mostly solar in the 2040s
- 50-70 GWh of storage by 2050

# Working group discussion

The working group:

- Agreed with the use of the CT and CT+ demand scenarios as the main sectoral driver scenarios.
- Considered that an aggressive renewable rollout was feasible, and that build scenario could assume 40% renewable by the early 2030s.
- Discussed the potential future need for a “minimum synchronous generation” requirement. EPWA noted that the modelling will assume the existing PNR tools are in place, and that potential new requirements will be considered in the next phase of the work.
- Agreed to model two levels of integration – status quo (self balancing) and full integration (system-wide dispatch).

*Does the PAC have any other comments on the high level scenario assumptions?*

# 3. Reliability Standard

# Reliability Standard

The PNR and HTR do not define a quantitative reliability standard. There is provision for the ISO to define “Peak Demand” and require exit users to demonstrate they have enough generation to cover it, but this is not currently deployed.

Published network planning criteria are mostly n-1, but some parts of networks are n-0.

For modelling purposes, it would be simplest to have the same standard across all connected networks, though this may not be the final state.

**Proposal:** Build sufficient generation and storage to avoid unserved energy in 10% Probability of Exceedance (POE10) peak events, while also meeting n-1 generation standard (spinning reserve covers the largest contingency)

The working group agreed that the proposed standard roughly reflects the existing generation planning approach, and could be used for modelling. A longer term reliability standard could be informed by work elsewhere, and EPWA will circulate the latest NEM reliability panel material when it becomes available.

The group also noted that the largest contingency could be a weather event affecting multiple renewable generators.

*Does the PAC have any other comments on the reliability standard?*



# Next steps

- Base model building is underway
- Scenario development and execution planned for May
- Modelling outputs will be discussed with the EPNR Working Group (workstream 1) on 23 May and 10 June
  - The EPNRWG will have an opportunity to refine scenario assumptions at the 23 May meeting.

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Western Australia.*

# Appendix. Introduction to the Modelling Tool

# Overview

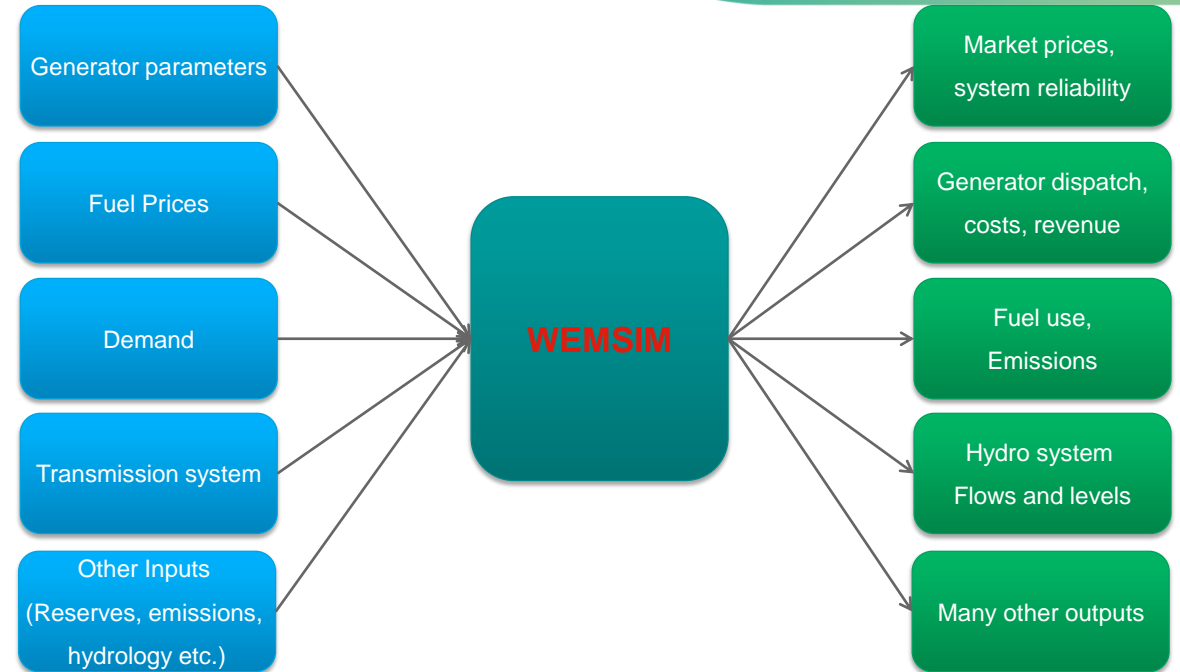
Wholesale Electricity Market Simulation (WEMSIM) is a linear programming modelling tool used to simulate cost- and bid-based electricity markets



- Flexible in its level of aggregation:
  - Time steps
  - Time horizons
  - Plant operational details
  - Transmission details
- Has been used to simulate power market outcomes in Australasia, Asia, Middle East, Europe and Central America
- Projects have included pool pricing analysis, revenue estimation and asset valuation, transmission constraint analysis, fuel contract structure comparison, market sensitivity, storage resource management, and policy analysis

# The Dispatch Simulation Model

- **WEMSIM (Wholesale Electricity Market Simulation):**
  - Simulates the dispatch of thermal, renewable, and storage resources in a multi-regional transmission framework
  - is an analytical dispatch planning and analysis tool with an optimization engine based on linear and mixed integer programming
  - Simultaneously optimizes generation dispatch, reserve provision (and, in MIP mode, unit commitment)



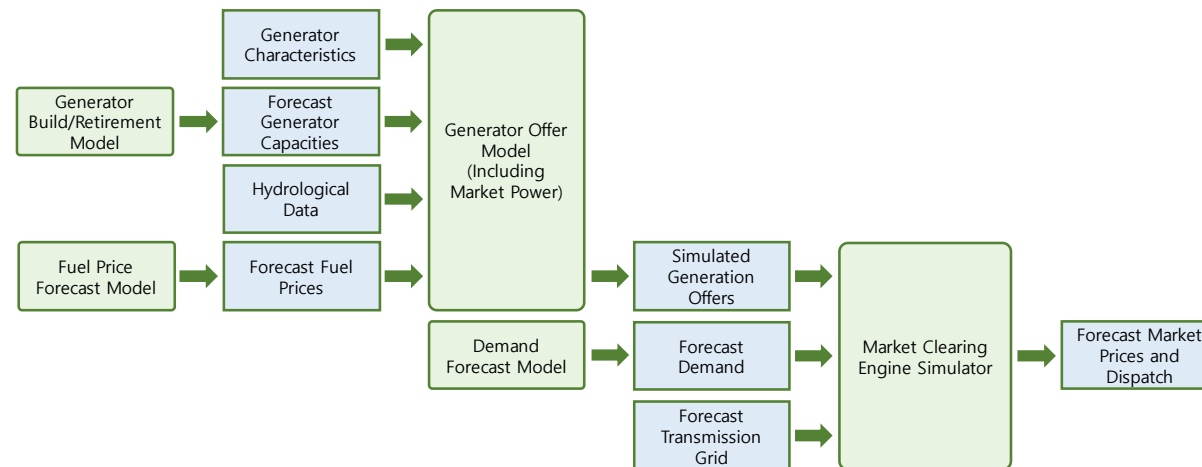
# Rich Outputs

Outputs available include: period-by-period energy and ESS prices, dispatch, fuel use, emissions, revenue, capacity factors, unserved energy, storage volumes, network flows, and transmission constraints

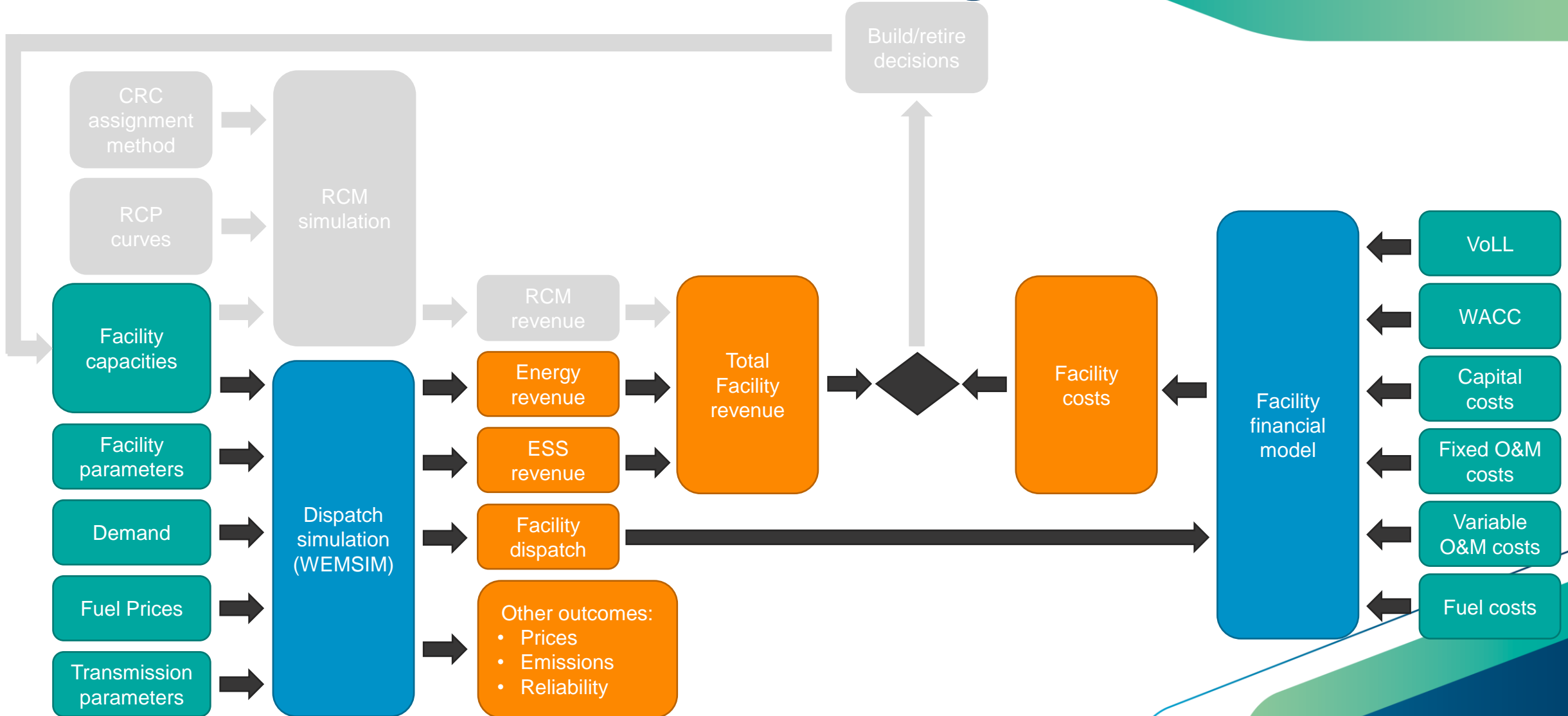


# Supporting Modules

- The Market Clearing Engine Simulator is the core of the platform, performing security constrained economic dispatch with ESS co-optimization
- The Demand Forecast Model transforms a given demand shape and long-term peak and energy forecasts into realistic demand data that captures both long-term trends and short-term volatility
- The Generator Build/Retirement Model can take manual entries where known or expected, and supplement with economic build/retirement decisions
- The Generator Offer Model can provide for offers based on cost, market power (Bertrand gaming), water values/stored energy values for hydro/storage systems, or derived from historic data



# Modules used for EPNR modelling







# Agenda Item 7: Harmonised Technical Rules (HTR) Issues and Gaps List

Pilbara Advisory Committee (PAC) Meeting 2024\_04\_18

## 1. Purpose

The purpose of this agenda item is to:

- provide the PAC with the initial HTR Issues and Gaps List ('HTR List', Attachment 1); and
- receive feedback on the HTR List.

## 2. Recommendation

That the PAC:

- (1) discusses the HTR List compiled from EPNR Working Group contributions; and
- (2) provides feedback to facilitate finalisation of the HTR List and guide the development of a forward workplan for Workstream 2 (HTR) of the EPNR Working Group.

## 3. Process

- Following the first EPNR Working Group meeting on 28 March 2024, members were invited to provide written submission to Energy Policy WA identifying existing issues and gaps in the HTR by 4 April 2024 (See Attachment 1).
  - The finalised HTR List will be utilised to identify, prioritise and organise and HTR issues and gaps into a forward workplan for EPNR Working Group (Workstream 2).
  - Energy Policy WA expects to facilitate four dedicated meetings for the EPNR Working Group (9 May, 11 July, 12 September and 14 November).

## 4. Next Steps

- Following PAC input, Energy Policy WA will finalise the HTR List and commence drafting a forward work plan.
- Energy Policy WA will circulate the draft workplan to the PAC out-of-session for comments and endorsement by COB 19 April 2024, and request feedback by COB 27 April 2019.
  - These timeframes will allow for the forward plan to be circulated to the EPNRWG Work Stream 2 members by COB 2 May 2024, in advance of the 9 May 2024 meeting.

## 5. Attachments

- (1) Agenda Item 7 - Attachment 1 – HTR Issues and Gaps List



## HTR LIST

Pilbara Advisory Committee (PAC) Meeting 2024\_04\_18

#	Rule	Description	Issue	Submitter
1	-	Black Start	Consider requirements adequacy of black start requirements/arrangements.	Horizon Power
2	-	Connection Point Compliance	Connection Point Compliance parameters and definition (including negotiated vs ideal rules - with particular consideration for brownfield plant vs greenfield).  Consider if any updates required to facilitate or improved the treatment of Connection Point Compliance measures.	Horizon Power, Rio
3	-	Rules Alignment	Align with SWIS / other network operators.	Rio
4	-	Standard references	Overall review of referenced standards, noting that some standards have more recent versions than those referenced.	Horizon Power
5	1.5	Definitions	Definition of contingency events versus credible contingency events and how this may flow on to pre-contingent events. The definition of credible contingency events currently doesn't align with the AEMC definition which relates credible to things like weather conditions and present threats.	Rio
6	1.5	Definitions	Better clarity required for definitions of distribution feeder / interconnector / tie (undefined but included in HTR Table 2.10).	ISO, Rio
7	1.5	Definitions	HTR 2.3.2e Describes 'essential system services' to be put last for load shedding Rio however this is different to the defined essential system services ESS as defined in PNR.  Similarly throughout the HTR "ancillary service" is used instead of "essential service" Rio the PNR and HTR should be aligned with this terminology to avoid confusion.	ISO
8	1.8.1(b)	Interconnection points	NSP to NSP connection arrangements in the HTR and accountabilities. Right now the Rules only reference NSP to Applicant, which results in confusion when it is NSP to NSP connections via tie lines.	Rio
9	2.2	Power system performance standards	Consider requirements to update voltage and frequency standards in accordance with proposed legislative changes to voltage and frequency requirements.	Horizon Power
10	2.2.1	Power system performance standards	Wholistic review of power system ride through requirements, and performance and restoration for major disturbances, including review of the target frequency recovery times under Section 2.2.1 25 minutes at 48 Hz may have adverse impacts on system security.	Horizon Power

11	2.2.1	Power system performance standards	Frequency variations - do we need to lower the single contingency event limit due to increasing penetration of renewables / less system inertia e.g. NT has 47 Hz.	ISO
12	2.2.1b	Power system performance standards	Is accumulated synchronous time error still required? Has been removed from NEM.	ISO
13	2.3.7, 2.3.8	Power transfer limits	Resolve responsibilities for determination of power transfer limits.	Horizon Power
14	2.6.2, Definitions	Protection	Definition of "back-up protection systems" for tie lines. Does this mean main & backup, or does this mean duplicate main protection.	Rio
15	2.6.4	Maximum total fault clearance times	Update Critical Fault clearing times at Dampier and Cape Lambert 33kV to reflect recent system changes and approved derogations.	ISO, Rio, Horizon Power
16	2.6.4	Maximum total fault clearance times	Overall review of visit of maximum fault clearance times (CFCT's) to ensure alignment. Currently there is misalignment between Western Power, Horizon Power and Rio Tinto technical rules.	Rio
17	2.4	ROCOF	ROCOF and include df/dt for under frequency load shedding and/or under frequency islanding. Determine if df/dt is used for islanding only, or can this apply to ufls too?	Rio
18	3	System strength	Consider requirements for NSPs to specify NWIS power system strength requirements and complete necessary assessments as renewable penetrations increases to ensure power system security.	BHP, ISO, Rio
19	3.2.1(f)	Cost of upgrades	Equipment ratings and the cost of consumed ratings - how are costs managed when upgrades are necessary, does the last project pay?	Rio
20	3.2.3	Disturbance Monitoring	Consider requirements regarding disturbance monitoring and synchrophasors.	Horizon Power
21	3.2.6 (b)	Protection	Requirements on NSPs to enact special protection schemes to manage network congestion/instability as required to enhance system security. However, this shouldn't be the sole option to manage security issues – network augmentation and re-dispatch are other methods by which this can be achieved.  Generators and loads to possess compliant control systems to facilitate operation of required network special protection schemes to be specified in connection agreements.	BHP
22	3.3	Generation ride through	Requirements for generation to ride through multiple consecutive power system disturbances including minimum number of disturbances rode through within a specific period.	BHP
23	3.3	Inverter generating units	Consider wholistic review of the treatment of Battery Energy Storage Systems and inverter based generating units, including clarity on which sections of the rules apply for these generating units.	Horizon Power, ISO
24	3.3	Inverter generating units	Reference to grid forming and grid following inverter technology may be helpful, with specific regard to the differences in the technical performance between the differing technologies. A definition here may be helpful as there doesn't appear to be a clear definition on what is grid forming, grid following, or what has virtual synchronous generator performance.	Rio

25	3.3	Inverter generating units	Additional requirements for dynamic performance on asynchronous inverter connected generation e.g. damping capability for reactive power and active power control systems for inverter connected generation.	BHP
26	3.3	Inverter generating units	Additional requirements for inverter connected generation response to power system disturbances, such as required magnitude of reactive current injection/absorption to support the power system during and post power system disturbances.	BHP
27	3.3	Inverter generating units	Requirements for storage devices to provide network support services (frequency and voltage support) when operating in load/charging mode to enhance power system security/flexibility. Currently the HTR requires storage devices to act as consumer equipment when withdrawing power from the network.	BHP
28	3.3	Inverter generating units	Consider update to Figure 3.3 noting the four-quadrant capability of inverters.	Horizon Power
29	3.3.3.1	Temperature dependency	Clarify treatment of ambient temperatures in the context of Section 3.3.3.1. Clarify distinction of using 'nameplate' vs 'derated capacity' when determining which set of generator compliance rules should apply.	Horizon Power
30	3.3.3.1 (reactive power capability), various others	Temperature dependency	<p>The temperature dependency is a critical factor in the Pilbara that is not adequately considered in the Pilbara HTR. The higher temperatures in the Pilbara will affect the generator's ability to comply with maximum output requirements (or the maximum output that can be expected).</p> <p>Reactive power related requirements are linked to temperature, whereas historical versions of the rules including the current Pilbara HTR have not linked active power to temperature. This issue should be resolved in the Pilbara HTR to allow the network operator to have a more realistic understanding of what the generation is able to and expected to achieve.</p> <p>In the WEM, wind farms struggle to meet the reactive power capability requirements at 40 degrees (for example A12.2.3.2). However, WEM Rules are more realistic where consideration of temperature is concerned.</p> <p>Of note:</p> <ul style="list-style-type: none"> <li>- Reactive power capability in clause 3.3.3.1 on possible map with locations and ambient temperature.</li> <li>- Active power capability might need to be de-rated for the wind and solar farms above certain temperatures. This may be a gap in the existing Pilbara HTR as we were unable to identify the relevant clause.</li> <li>- Recommend a review of clauses that refer to "ambient temperature" in addition to the above to ensure suitability.</li> </ul>	BP
31	3.3.2, 3.4.3, 3.6.5, / 4.1.3 / 4.2.5 /	New Connections	<p>Definition and use of 'energisation' vs 'commercial operations' is inconsistent throughout the HTR and PNR. Clarity is required about the process and what actions are required from each party at which stage.</p> <p>Inclusion of data to be submitted with connection applications (See Horizon Power Tech Rules Sections 3.3.2, 3.4.3, 3.6.5, and Attachments 3-10).</p>	Horizon Power, ISO

	Attachments PNR 255, 269, 270, 274D, 274H			
32	3.3.3.3(c)	Immunity to voltage excursions	Renewable generation could comply, but the requirement of 460 ms ride through is overly onerous. We suggest this is revisited system wide to test suitability given it is inconsistent with other countries. The interpretation of the wording should be clarified as it is not clear if this a requirement or optional (Western Power historically tested compliance with this an equivalent clause with some flexibility in the interpretation).	BP
33	3.3.3.3(d)	ROCOF	Currently requirement is for up to 4 Hz per second. This requirement has been updated in the WEM Rules.	BP, ISO
34	3.3.3.3(f)	Post-fault reactive power of a power station with non-synchronous generating units	Wholistic review of power system ride through requirements, and performance and restoration for major disturbances, including: - Review Section 3.3.3.3(f) - Absorption of reactive power is helpful under some circumstances and may be required for longer periods. Review clause in context of new operating environment. - Most OEMs struggle to achieve the requirement for any pre-fault absorption of reactive power to be terminated within 200 ms after clearing of the fault. Further, from a system perspective, it would not be optimal if all generators stop absorbing after 200 ms. - The WEM Rules have changed this clause (as did the proposed updated to the WP TR).	Horizon Power
35	3.3.3.3(h)	Continuous uninterrupted operation	It is not prudent for the system if all generators follow this requirement simultaneously. This clause has been changed in the WEM Rules. Further, we note that some wind generators have not been able to meet this requirement.	BP
36	3.3.4	Monitoring and Control Requirements	Inclusion of Monitoring and Control Requirements (See Horizon Power Tech Rules Section 3.3.4).	Horizon Power
37	3.3.4.4(d)	Dead band	This is currently 0.05 Hz. The point at which the dead band is measured is unclear in the current drafting and needs to be updated. The WEM Rules have been revised to be +/-0.025 Hz around 50.0 Hz (refer to A12.6.1.9).	BP
38	3.3.4.4(f)	Rate of response	The identified rate of response is difficult for some OEMs of non-dispatchable generating units to achieve – the current requirement is achieving 90% within 2 seconds and new output to be sustained for no more than 10 seconds.  The minimum requirement of WEM rules (12.6) states asynchronous machines to meet 60% of the freq response in 6 seconds and 90% by 15 seconds.  Related clauses in the WEM Rules to consider are: – A12.6.3.2 which provides more achievable requirements than the current Pilbara HTR. – A provision for negotiating the standard is requested.	BP

39	3.3.9, 3.6.12	Model	Model guidelines and interaction of modelling guidelines with the HTR. How to ensure there are no mismatches in models.	Rio
40	3.4.10.2	Pole slip	Consider requirements for pole slip protection, e.g. where critical fault clearance time (CFCT) issues exist.	Horizon Power
41	4 / Attachment 11	Testing	Inclusion of Testing requirements and test details for connection of Generating Units (See Horizon Power Tech Rules Attachment 11).  Dispatchable and non-dispatchable generator testing and compliance requirements and R2 model validation. What are the non-dispatchable unit testing requirements, and how does this differ to dispatchable units.	ISO, Horizon Power, Rio
42	4	Testing	Requirements for NSP to verify integrity of the UFLS scheme across the NWIS network via periodic tests and publish an annual performance report based test results and actual power system UFLS events, this will provide confidence to all customers of UFLS performance integrity and power system security.	BHP
43	4 / potential new section	Flexibility to negotiate when issues are identified post-testing	The existing Pilbara HTR offers disconnection as the primary means of dealing with non-compliance. There would be benefit for all parties if negotiation mechanisms were provided for that allow for re-testing and rectification of non-compliance without disconnection. This would enable parties to identify the causes of any performance issues and work together to solve them and continue operation where this is within acceptable risk limits given the unique non-compliance or performance issues.  Sections in the Horizon Power TR A11.6 relate to these mechanisms where testing is concerned. Further work at both the Pilbara HTR and the various NSP TRs could be needed to achieve more optimal outcomes.	BP
44	5.4.1	Power System Fault Levels	Review of fault level management on the system: - Consider minimum fault rating requirements for Transmission plant at significant network nodes, and fault level management. - Consider potential requirements for limitations on maximum fault levels on the system and consider providing guidance on the calculation of fault levels. Define credible versus ultimate case.	Horizon Power, Rio
45	PNR 138	Metering	Improve definition of metering obligations for managing EBAS obligations.	Horizon Power
46	PNR Chapter 8	ESS Costs	How ESS costs are to be allocated (noting at the PAC Meeting 29.02.2024, the ISO advised that nominations would be called for a separate working group to be formed on this issue).	Rio