

Meeting Agenda

Meeting Title:	Evolution of Pilbara Network Rules Working Group
Workstream	Workstream 1 (PNR Workstream)
Date:	15 April 2024
Time:	9:30am – 11:30am
Location:	Online, via TEAMS

Item	Item	Responsibility	Type	Duration
1	Welcome and Agenda	Chair	Noting	2 min
2	Meeting Apologies and Attendance	Chair	Noting	2 min
3	Competition Law Statement	Chair	Noting	1 min
4	Modelling approach - recap	RBP	Discussion	20 min
5	Sectoral drivers	RBP	Discussion	30 min
6	Integration options	RBP	Discussion	20 min
7	Reliability standard	RBP	Discussion	35 min
8	Next steps	Chair	Noting	10 min
	Next meeting: 23 May (PNR workstream)			

Competition and Consumer Law Obligations

Members of the PAC's Evolution of the Pilbara Network Rules Working Group (**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 EPNRWG 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.



Government of Western Australia
Energy Policy WA

Evolution of the Pilbara Network Rules Working Group Meeting 2024_04_15

15 April 2024

Working together for a
brighter energy future.

Meeting Protocols

- Please place your microphone on mute, unless you are asking a question or making a comment
- Please keep questions relevant to the agenda item being discussed
- If there is not a break in discussion and you would like to say something, you can 'raise your hand' by typing 'question' or 'comment' in the meeting chat
- Questions and comments can also be emailed to EPWA - Energy Markets energymarkets@dmirs.wa.gov.au after the meeting
- The meeting will be recorded and minutes will be taken
- Please state your name and organisation when you ask a question
- If you are having connection/bandwidth issues, you may want to disable the incoming and/or outgoing video

Competition Law Statement

Working group members must take care to avoid anti-competitive conduct.

Where working group members are or are likely to be in competition with one another, members must not discuss information that is not otherwise in the public domain about commercially sensitive matters, including:

- a. rates or prices (including any discounts or rebates) for goods or services produced by the members;
- b. confidential details regarding a customer or supplier;
- c. business strategies for competitive activities including, without limitation, approaches to bilateral contracting or bidding in energy or ESS markets;
- d. prices paid or offered by members to acquire goods or services; and
- e. confidential details regarding of a supplier of goods or services, including any circumstances in which a member has refused to or would refuse to acquire goods or services.

Agenda

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Meeting objectives

1. Confirm modelling approach
2. Agree high-level scenario assumptions
3. Agree reliability standard to apply to modelling

4. Modelling approach – recap

Modelling approach

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

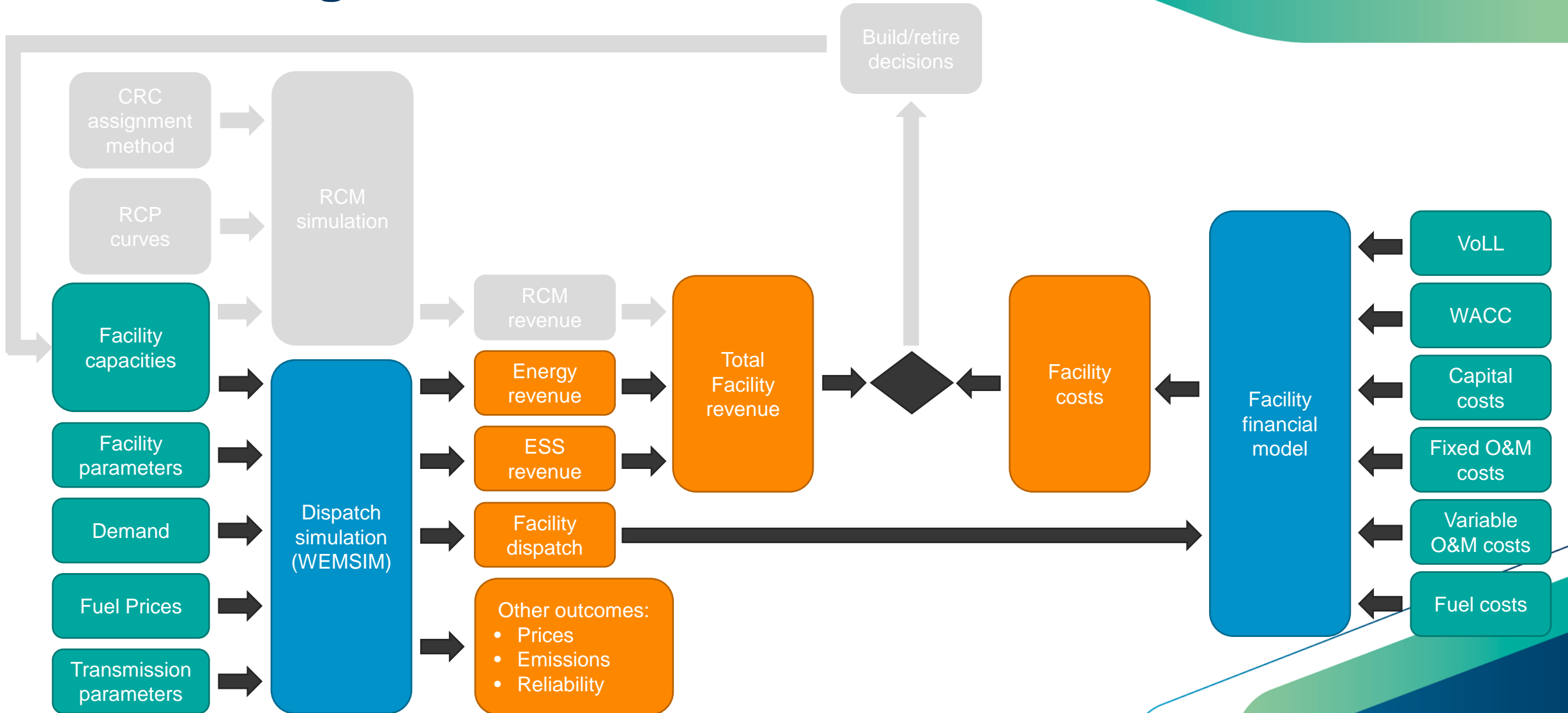
Key items to explore:

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

Key assumptions:

1. Demand is taken as a given. Generation will be built to service demand and avoid unserved energy.
2. Unconstrained transmission investment – generation location is less important than its quantity.
3. Startup/shutdown costs included in the dispatch optimization.

Modelling market outcomes



Dimensions for scenario definitions

We propose to define scenarios in two dimensions:

- Sectoral drivers: Different levels of demand growth and/or renewable penetration
- Integration options: Different extents of operational integration or coordination

We need to limit to a maximum of 3x3 or 2x4.

All scenarios will assume:

- increased renewable penetration over time, to 100% renewable by 2050
- power system security and reliability requirements are met.

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

5. Sectoral drivers

Sectoral drivers

Sectoral drivers relates to the underlying situation in the Pilbara.

For example, scenarios could include:

- High demand growth, high renewable penetration
- Low demand growth, low renewable penetration

Sectoral drivers can include variations in potential input data, such as:

- Fuel price
- Carbon cost
- Specific interconnection options

2023 Modelling Scenarios

Five scenarios were developed to provide a range of complementary perspectives of the evolution of the NWIS.

These scenarios are helpful in reflecting the range of possible futures in the Pilbara and provide a structured way of making strategic choices in an uncertain environment.

Two different types of scenarios were explored:

Control Scenarios: Bottom-up assessment of identified plans.

Decarbonised Futures: More stringent emissions limits drive increased demand and faster renewable penetration

Control Scenarios

Current Trajectories (CT) – current industry-announced plans to decarbonise the Pilbara:

- electrification of iron ore mine haulage
- decarbonisation of onsite electricity at LNG plants
- growth and decarbonisation of the lithium mining sector
- plus a modestly sized hydrogen export industry

Current Trajectories + loads (CT+) – additional demand associated with the establishment of new energy intensive industries:

- New industrial demand associated with the land allocations at the Maitland, Boodarie and Ashburton Strategic Industrial Areas (SIAs)
- deployment of substantial carbon capture and storage (CCS) facilities for reservoir emissions in the LNG sector and industrial emissions in the chemical sector.

Current Trajectories with Barriers – potential implications of existing barriers to the deployment of green energy infrastructure:

- Issues accessing land
- Domestic labour
- Global supply chains
- The commercialisation of green technology

These barriers were implemented in the form of a two-year delay in the electrification of mine haulage, build limits at nodes, cost escalations and an extension of time required to deploy new projects.

Decarbonised Futures

WA Step Change – Pilbara decarbonisation objective aligned with the IPCC outcome of limiting warming to ~1.8°C via a ‘carbon budget’. Steeper emissions reduction to net zero.

Key assumption: electrification of gas compression and liquefaction process in existing LNG plants.

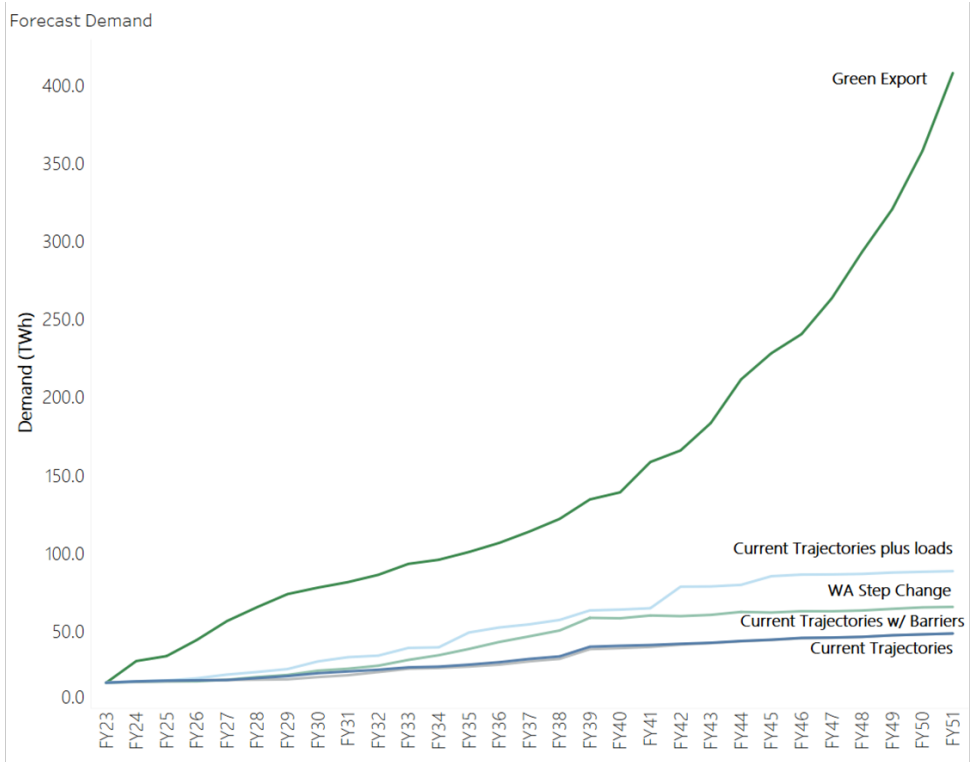
Green Exports – Carbon budget consistent with the IPCC outcome of limiting warming to 1.5°C. Rapid demand growth driven by demand for hydrogen exports, domestic use of hydrogen and green iron production.

Key assumptions:

- accelerated electrification,
- large-scale green hydrogen industry,
- increased domestic and export opportunities,
- stronger economic and population growth.

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

6. Integration options

Integration options

Integration options relate to the level of coordination in operational arrangements.

Proposed scenarios:

- Existing arrangements continue:
 - Individual network owners continue to self-balance and serve their own load
 - Limited energy sharing across vertically integrated players.
- Increased coordination, for example, through a centralised energy balancing service.
- Full integration in centralised dispatch with system wide balancing and essential system services

Modelling approach

We use an optimisation model. It will optimise across the entire power system unless constrained to do otherwise. This approximates full centralised dispatch.

Self-dispatch and self-balancing can be modelled by including additional constraints forcing load to be met in each relevant part of the overall system.

Intermediate levels can be approximated by restricting the facilities which can adjust output.

7. Reliability standard

PNR definitions

A4.13 It is a function of each NSP ... to:

- (a) Maintain and improve Security and Reliability in its Network; and
- (b) ... participate in and contribute to the achievement of the System Security Objective in the Power System.

Reliability: Means a measure of a Power System's ability to deliver electricity to all points of consumption and receive electricity from all points of supply within accepted standards and in the amount desired.

153 (1) The ISO must ... determine the ... Generation Adequacy Margin ... by which each Exit User's Total Allocation from Generators must exceed its chosen Demand Cap.

156(1) An Exit User must calculate its forecast "Peak Demand", which is to be an estimate, calculated in good faith in accordance with GEIP and the Generation Adequacy Procedure, of the Exit User's credibly possible maximum aggregate energy withdrawals in MW across all of its Exit Points at times of Power System Peak Demand.

A5 2.5(a) In NSP must develop, maintain and from time to time review, and may from time to time amend, planning criteria for its network

PNRs assume firm generation. Reliability criteria not explicitly defined.

[ADEWAP](#), [Horizon](#) network planning criteria: Transmission network is mostly n-1, but some elements n-0.

Proposal

Peak Demand: 50% Probability of Exceedance (POE)? 10% POE?

Level of redundancy: n/n-1/n-2...

Generation adequacy margin: Ancillary services? One outage? Multiple outages? Historical outage rates?

Tolerance for unserved energy: 0.002%? 0.0002%?

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% POE peak events, while also meeting n-1 generation standard (for spinning reserve)

8. Next steps

Next steps

9 May – HTR workstream meeting

23 May – PNR workstream meeting: discuss initial scenario outputs

10 Jun – PNR workstream meeting: discuss final scenario outputs

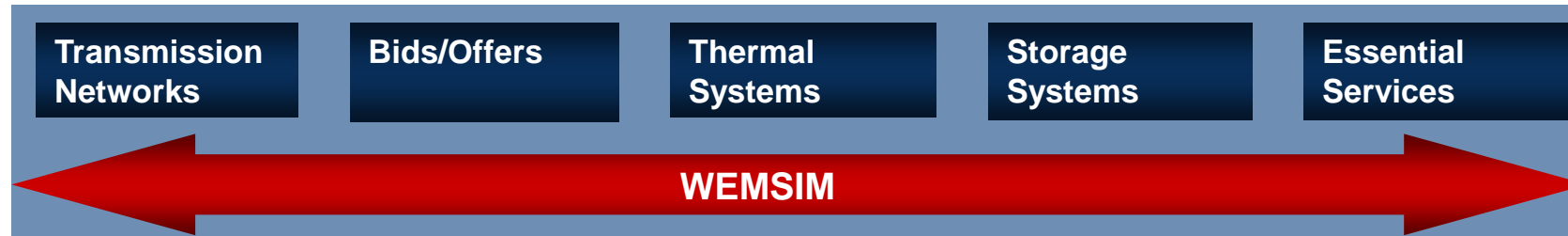
Questions or feedback can be emailed to energymarkets@dmirs.wa.gov.au

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Appendix. Introduction to the Modelling Tool

Overview

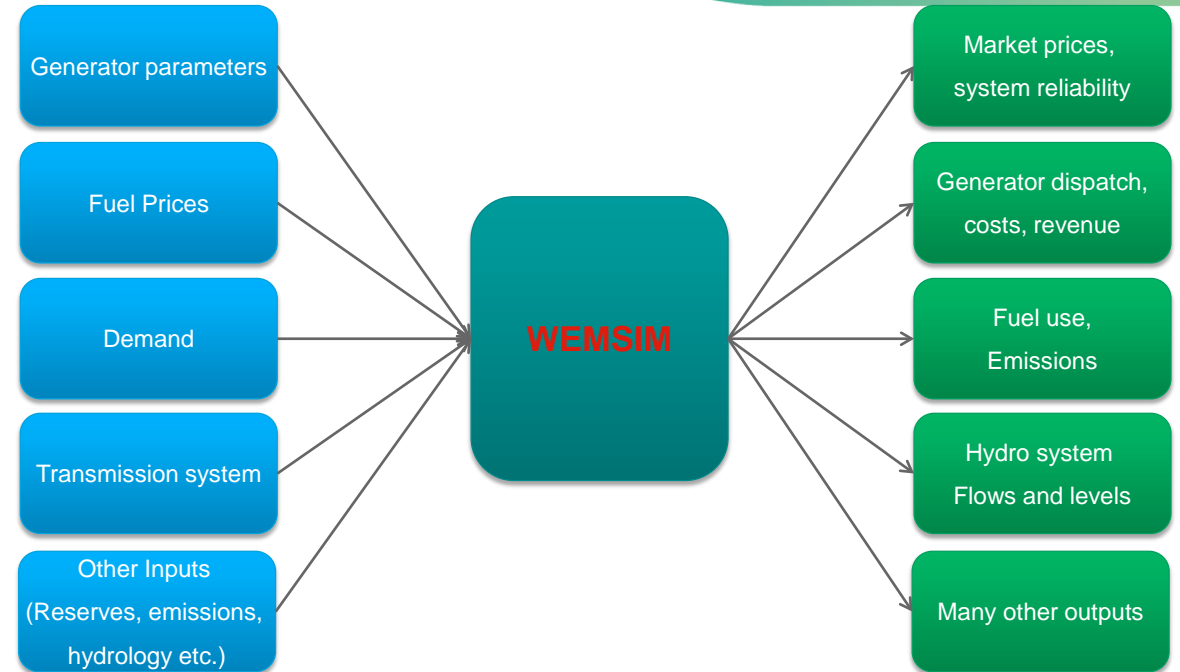
Wholesale Electricity Market Simulation (WEMSIM) is a linear programming modelling tool used to simulate cost- and bid-based electricity markets



- 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 optimises 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-optimisation
- 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

