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8 February 2019

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Dear Sara

**Report to the Minister for Energy on the Effectiveness of the Wholesale Electricity Market
2017/18 – Western Power Submission**

Western Power welcomes the opportunity to respond to the Economic Regulation Authority's report to the Minister for Energy on the effectiveness of the Wholesale Electricity Market 2017/2018.

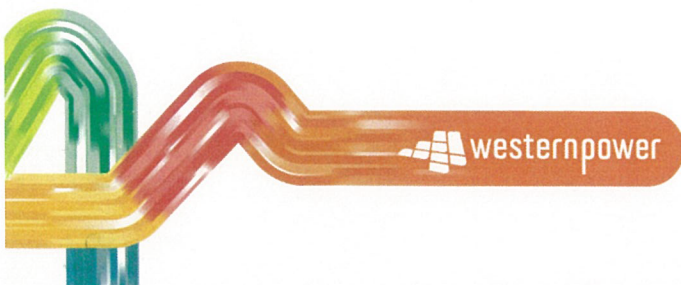
Please see **attached** Western Power's submission.

Should you have any queries, please contact Rudi James on [REDACTED].

Yours sincerely

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Attachment: Submission to the ERA

Report to the Minister for Energy on the Effectiveness
of the Wholesale Electricity Market 2017/18

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1. Introduction

Western Power welcomes the opportunity to respond to the Economic Regulation Authority's (ERA) report to the Minister for Energy on the effectiveness of the Wholesale Electricity Market (WEM) 2017/2018 (Report).

As a Network Operator in the WEM, Western Power plays an important role in the operation of the transmission and distribution systems that form part of the South West Interconnected System (SWIS) and the connection of new generation to the network. Western Power's network is powered by a wide range of traditional and renewable energy resources and provides customers with a safe, reliable and efficient electricity supply. To date, the development of the Western Power network has been managed prudently to minimise the required construction of new lines, terminals, substations and circuits in order to reduce capital costs.

Western Power continues to work closely with the Public Utilities Office (PUO), Australian Energy Market Operator (AEMO) and other key stakeholders on the electricity sector reform program which aims to progress regulatory reforms. As identified in the discussion paper, the extensive market reform program which is underway provides for an opportunity to examine and assess the existing framework and address any shortcomings in the market mechanisms. Western Power raises a number of matters in this submission which it considers to be shortcomings in the WEM.

Western Power agrees with section 3.6 of the Report and the ERA's suggestion that the future environment will be challenging for the private sector if demand forecasts and timely signalling of existing capacity does not improve, and if there is an absence of proper guidance regarding battery storage in the WEM. Western Power is also of the view that policies should be implemented to encourage consumers with rooftop PVs to change their demand patterns to lower electricity costs in the WEM.

Western Power's submission has been categorised into four main themes:

- the investment environment in the WEM;
- the retirement of generation;
- demand forecasts; and
- the modular network.

The submission addresses several questions raised by the ERA in the Report, as well as other related matters that Western Power considers relevant.

2. Investment environment in the WEM

Western Power considered questions 11, 13 and 14 in the Report for the response below.

- *Question 11: Do market participants consider the investment environment in the WEM is challenging? If so, why?*
- *Question 13: What is the likelihood that the State Government will need to invest to replace generation assets?*
- *Question 14: What could organisations such as the ERA, AEMO, Western Power and the State Government reasonably do to improve the investment environment?*

Western Power is of the view that the established reserve capacity mechanism and balancing market in the WEM are incentives for investors in the WEM. However, investors may encounter a number of issues that can potentially discourage them from investing in the WEM.

Challenges in the WEM investment environment

The challenges that investors may encounter include network accessibility and availability of useful information. These challenges are discussed below.

- **Network accessibility**

Network constraints are often present when large generators wish to connect in the same area. To address the network constraints, investors may need to wait for network augmentation to occur and/or contribute to the cost of network augmentation as part of the network connection process. An alternate to network augmentation under an unconstrained market would be to introduce a constrained market in the WEM, this is discussed further below.

- **Availability of useful information**

Demand forecasts play an integral part in the investment decision-making process however, demand has become more difficult to forecast due to the impact of new technologies. The issue is discussed further in Section 4 of this submission: Demand Forecast.

Western Power's Annual Planning Report highlights the emerging network capacity and major assets issues, and the potential solutions to those issues. However, there is no consolidated central source of information available to investors that holistically considers network investment information and generation forecast information for the SWIS. Therefore, investors may not be able to consider the current and future network constraints issues alongside the current and future generation shortfalls.

Western Power is also of the view that there are limited incentives for investors to locate loads or generators in unconstrained areas. The lack of incentives may lead to potential investors not considering investing in the WEM.

Improvements to the WEM investment environment

Western Power is of the view that the WEM investment environment would be enhanced if correct and early market signals are made available, fully constrained access is introduced, an Integrated System Plan (ISP) is published, and appropriate amendments are made to the Technical Rules.

- **Correct and early market signals**

Correct and early market signals may promote the investment in new and efficient generation in the WEM. Through this market mechanism, market participants with ageing and inefficient generation may retire their plant due to competition with new and efficient generation. The market signals can take the following forms:

- **Data:** The publication of market data showing plant utilisation, services provided by each generator and the earnings of each generator (as is the case in other electricity markets) would allow investors to carry out their own analysis when making investment decisions.
- **Incentives:** Investors should be incentivised to connect new generation in locations that fully utilise the current network and are close to high demand areas. This could reduce the upfront costs associated with network augmentation and the long-term network constraint costs that will be covered by tariffs. It may also reduce the level of congestion present in the high demand areas of the network.

- **Fully constrained access in the WEM**

The introduction of a fully constrained access market may lower one of the barriers to entry into the WEM. Under the fully constrained access arrangement, customers would be able to connect to the network faster and at a lower cost. In the current unconstrained access market, new generators are required to not impact the firm access rights of existing generators. This may result in lengthy delays for connection and/or upfront contributions to relieve network constraints, even where the constraints would only bind occasionally for a few hours during the year. Western Power is also of the view that, in some cases, augmentation of the network may not be the best option due to the uncertainty of demand.

Western Power's recent experience with the Generator Interim Access (GIA) solution has enabled Western Power to offer network connections for up to 900MW of new renewable energy projects. This temporary measure for a partially constrained network access regime has enabled connections to the network that would not have otherwise been viable under the current unconstrained network access arrangement.

- **Publication of an Integrated System Plan**

The publication of an integrated grid plan was a recommendation given in the Finkel report for the National Electricity Market (NEM)¹, with AEMO publishing the inaugural ISP for the NEM in July 2018. The PUO is currently looking into the publication of an ISP for the WEM. Western Power is in support of this as an ISP would provide Western Power, AEMO and investors with better visibility of the long-term power system plan and assist with their long-term investment decisions.

- **Amendments to the Technical Rules**

The Technical Rules consist of the standards, procedures and planning criteria governing the technical standards for access to the Western Power network and interconnected third party networks as well as the performance, operation and planning of the network. When first drafted, the Technical Rules were reviewed to eliminate overlap with the WEM Rules, provide clarity of obligations, and be internally consistent and legally correct². The Technical Rules were also written in a period where System Management was a segregated business unit of Western Power. Since the publication of the Technical

¹ Independent Review into the Future Security of the National Electricity Market: Blueprint for the Future, Commonwealth of Australia, recommendation 5.1.

² Decision and Explanatory Memorandum on the Draft Technical Rules for Western Power's South West Interconnected Network – Western Power Submission.

Rules, significant changes have occurred, including the transfer of System Management functions from Western Power to AEMO and the introduction of new technologies in the SWIS.

The Technical Rules provide for the reliability and stability of the transmission and distribution network covered under the Access Code and their intended audience consists of all loads, generators, ancillary service providers, system operator and network service providers.

Western Power is of the view that there is an opportunity and need for the Technical Rules and its framework to be reviewed. The review can take into consideration improvement opportunities that would support investment in the WEM as well as provide clarity, consistency, legal correctness and removal of duplication with other legislative instruments such as Electricity Industry (Network Quality and Reliability of Supply) Code 2005.

3. Retirement of Generation

Western Power considered questions 8 and 9 in the Report for the response below.

- *Question 8: Should market participants signal intended or probable plant retirements at least three years in advance, as has been suggested in the National Electricity Market; or, should the market operator undertake its own analysis of the probable plant exit dates?*
- *Question 9: If not advanced notice of plant retirements, what other mechanisms could be used to signal investment opportunities and improve the operation of the capacity mechanism?*

Western Power is of the view that advanced notice of plant retirements in the WEM is necessary to signal investment opportunities to the market. The signal of investment opportunities can be provided through advanced notice by market participants and also through market signals, as discussed in Section 2: Investment environment in the WEM.

In Western Power's experience, a lead time of more than three years is often required to design and build new generation, conduct the necessary network studies, carry out any network augmentation and complete connection works. At times, a minimum of three years is required to implement the necessary network augmentation to the network. For example, Western Power may need to construct new distribution or transmission lines, which would require scoping, planning and delivery of works and scheduling of network outages. The amount of advanced notice required to be provided by market participants would vary for every situation. However, in general, advanced notice period of at least five years would be beneficial.

The location and type of new generation replacing retired generation are important factors when considering the safety and reliability of the network. At times, Western Power has found that network augmentation is required when retired generation is not being replaced by new generation that is providing similar services at the same location.

4. Demand Forecasts

Western Power considered question 7 in the Report for the response below.

- *Question 7: To what extent do market participants rely on, or derive benefit from, the electricity statements of opportunity in planning and investment decisions?*

Western Power has found the Electricity Statements of Opportunity (ESOO) report issued by AEMO to be useful as it has allowed the business to compare its demand forecasts and reconcile any material differences between the forecasts. Western Power sees further benefit if AEMO were to issue more supporting documentation, like that provided in the NEM, for its WEM forecasts.

Western Power forecasts both demand and annual peak demand every year to assist with the network planning processes. Each year Western Power provides a new 10-year demand forecast to ensure that changes in trends are identified in a timely manner, risks in year-to-year load variations are assessed carefully and efficient network expansion plans are developed.

Demand forecasting is a costly and timely process that may produce inaccurate results. For example, the accuracy of a 10-year demand forecast is dependent on the accuracy of demand drivers, such as population growth, economic growth and building efficiency improvements. Small errors made with respect to key demand drivers are likely to accumulate to large errors over a period of 10 years. Western Power is of the view that more effort should be made to improve the accuracy of the demand drivers and overall quality of demand forecasts. Western Power has undertaken significant investment in building an econometric-based forecasting model to highlight demand drivers based on the impact of rooftop PVs.

Through the publication of long-term demand forecasts, market participants and investors in the WEM would be able to reap the following benefits:

- Identification of fundamental demand drivers and the likely impact of their variability on the demand for electricity.
- Identification of the source of demand volatility and estimation of the magnitude of short-term and long-term demand volatility.
- Analysis of consumer habits through their use and sourcing of energy.
- Estimation of the sensitivity of electricity demand to the variability in the demand drivers.

The current volatility in demand, largely due to the increasing number of rooftop PVs, requires the introduction of policies and tariff reforms that dampen demand volatility over time. The following methods may encourage demand stability:

- The implementation of policies that will raise consumer awareness of demand variability and provide financial incentives (use electricity tariffs) to motivate consumers to change their demand patterns for the benefit of the WEM.
- The allocation of an increased share of WEM costs of peak time demand to consumers, such as the inclusion of a season peak demand component to the electricity tariff.
- The widespread adoption of energy storage systems in the SWIS.

5. Modular Network

Western Power considered question 10 in the Report for the response below.

- *Question 10: To what extent do policy uncertainty and behind-the-meter changes in generation and storage influence decisions to develop projects in the WEM?*

Western Power agrees with the ERA's observations in the Report that over-generation from rooftop PVs could, in some areas, impair network security and that network planning is essential to ensuring the integration of new technologies to the current network. Western Power is of the view that the future network will be more modular as behind-the-meter generation continues to increase.

Western Power supports the modular network and is currently evolving its single interconnected network to a modular network. The modular network is comprised of rooftop PVs, batteries, advanced meters, microgrids and stand-alone power systems used in conjunction with poles and wires. When fully transitioned, the modular network will increase consumer choice in how they manage and use their energy, improve end-user power supply reliability, keep network costs down and respond to customer demand for renewable energy choices. In the future, consumers will be able to sell or share their excess energy generated through rooftop PVs or other technologies, own a piece of a community battery and have more control of their electricity use through smart devices.

Western Power is of the view that the transition of the single interconnected network into a modular network would require the following:

- **Removal of the current legislative limitations**

While Western Power has undergone successful trials with new technologies (microgrids, stand-alone power systems and other new technology pilot projects such as community batteries), current legislative limitations have prevented Western Power from deploying these new technologies on a large scale and fully diversifying its single interconnected network. However, under current legislation, the SWIS is defined as a physically interconnected network that does not include non-interconnected microgrids and other equipment. As Western Power's statutory function is limited to the SWIS, Western Power is unable to implement new technological solutions as these solutions are not interconnected. Should these legislative limitations be removed, Western Power will be able to fully evolve its network to a modular network which would allow the associated benefits to be realised by customers.

Western Power is of the view that consideration should be given to align the legislative changes in the WEM with the NEM reforms that has been proposed by Australian Energy Market Commission, most recently relating to stand-alone power systems.

- **Data**

Western Power agrees with the recommendation from the Finkel report that a data collection framework needs to be developed to provide real-time data for all distributed energy resources (DERs).³ As the network continues to evolve, there is an increasing need for access to more timely and detailed energy data to allow more efficient utilisation of existing and new technologies. Western Power's Advanced Metering Infrastructure (AMI) program seeks to achieve this. The AMI program takes advantage of the smart technology that is in line with other energy networks across the world and combines advanced meters with new technologies to deliver benefits across the electricity value chain.

³ Independent Review into the Future Security of the National Electricity Market: Blueprint for the Future, Commonwealth of Australia, recommendation 2.6.

The PUO is also considering on developing a register of DER in the WEM, similar to the DER register that has been established in the NEM.

- **Technological barriers**

Consideration should be given to the technological barriers that arise from the integration of new technology with the existing network. These issues arise as the network was originally designed to facilitate conventional generation. For example, the network was designed to facilitate the delivery of electricity in one direction whereas, new technologies require that the network facilitate the delivery of electricity in both directions.

Voltage control issues are emerging due to the high penetrations of DERs and the displacement of conventional generation. As a result, the current voltage operating range specified in the Electricity Industry Act 2004 needs to be reviewed and set to an appropriate level. Western Power is also seeing emerging issues in the distribution network due to the increasing number of distribution connected generators. There seems to be a need to establish transmission and distribution connection standards. Western Power is also of the view that the current ancillary services requirements, costs and payment structure will need to be reviewed.

On page 16 of the Report the ERA noted that “Western Power’s knowledge of customer consumption patterns and system locations also gives it an advantage over prospective entrants to the market”. Western Power would like to clarify that Western Power provides customer consumption patterns and system locations that it collects to the retailers. Therefore, by sharing this information with the relevant retailers, Western Power is of the view that it does not have advantage over prospective entrants to the market.

As the only Network Operator in the WEM, Western Power is in a unique position to develop examples of customer benefits to maximise the efficiency of current infrastructure. Through trialling new network approaches Western Power has been able to find more innovative energy solutions and identify opportunities to integrate new technologies into the SWIS in preparation of future market reform.