Annual Wholesale Electricity Market Review

Submission to the Economic Regulation Authority

18 July 2008

1 Introduction

Western Power welcomes the opportunity to contribute to the review of the Wholesale Electricity Market (**WEM**) in Western Australia's electricity industry.

In recognition that Western Power's system management role is ring-fenced from the rest of the organisation, this submission addresses relevant points from a network management perspective. Responses relating to system management functions will be lodged with the Authority separately.

This submission is structured in response to points raised by the Economic Regulatory Authority (**Authority**) in its discussion paper.

Western Power is open to discuss any issues the Authority may wish to raise, either upon receipt of this submission or at a later date.

2 Discussion points

The following responds to points raised in the Authority's discussion paper.

2.1 The Authority invites comment on the impact of fuel supply and fuel prices on the market. In particular:

- **to what extent, and in what way, do current issues in regard to fuel supply or fuel prices impact on long-term investment decisions in the market; and**
- **to what extent, and in what way, do current issues in regard to fuel supply or fuel prices impact on the day-to-day operation of the market, and outcomes in the market.**

This year, Western Australia has experienced a couple of events severely impacting its supply of natural gas, which is a major fuel source for electricity generation and industry. These events highlighted Western Australia's vulnerability in terms of fuel source dependency, and had severe consequential impacts on the State's energy intensive economy, industry, and on the community.

Network Management is of the view that a Western Australian energy policy is required to maximise the State's ability to effectively manage:

- Security of fuel supply;
- Market signals around the adequacy of fuel diversity; and
- Effects of escalating global fuel pricing trends to ensure market and network security.

In the context of fuel supply and fuel prices, Network Management also suggests consideration should be given to the following issues:

1. During times of fuel restrictions the requirement to run generation based on fuel availability becomes an additional factor increasing the requirement for network capacity that would not exist otherwise. Other factors include scheduled plant outages, network limitations and system faults. Operating in this manner will have a tendency to increase network costs, as it increases requirements to enable unconstrained operation of the network, beyond levels experienced by other markets such as the National Electricity Market.
2. Currently, coal has a price advantage over gas, which is likely to provide a net benefit for the connection of coal-fired generation over gas-fired generation. It is unclear whether this position is consistent with the energy policy objectives for Western Australia, trend of future generation sources, and likely impacts of environmental restrictions and carbon taxes.

2.2 The Authority invites comment on the impact of fuel constraints on the market. In particular:

- **to what extent, and in what way, do fuel constraints impact on the day-to-day operation of the market, and outcomes in the market;**
- **to what extent, and in what way, does the design of the market exacerbate problems caused by significant fuel constraints; and**
- **do current issues in regard to gas supply interruptions deter participation in the STEM.**

Network Management has no comment to provide at this time.

2.3 The Authority invites comment on the application process for network access offers. In particular:

- **at what stage during the process of planning a new facility do applicants approach Western Power, and to what extent do applicants make applications for network access in advance of the timing of the reserve capacity cycle due to the perception that the application process may take some time;**
- **to what extent has the timing of the application process affected participation in the reserve capacity mechanism for particular facilities;**
- **to what extent is the application process, including the timing of the application process, transparent; and**
- **if there is an issue with the application process, does the issue relate to the timing of the process, the transparency of the process, or both.**

Network Management considers that the two-year lead-time for the Reserve Capacity Process may not be adequate to ensure timely network connections. Currently, there is significant risk that the two-year capacity auction window run by the Independent Market Operator (**IMO**) will restrict Network Management's ability to build the infrastructure to allow unconstrained generation connection. The network currently does not have spare capacity for any significant generation. The planning of the network responds to the additional generation requirements once the project becomes firm. This often does not provide sufficient time for completion of the connection.

The timing of submissions for connection applications received by Network Management varies from a few months to a few years before the reserve capacity cycle. In the case of small generators, even with a few months notice, Network Management could possibly process applications in time for the reserve capacity cycle. However, in the case of large generators, 12 to 18 months notice would be the minimum required to process an application depending on the extent of approvals required. Construction of works to connect large generators can take two to three years, or longer, depending on the scope (timeframes can be significantly longer if major transmission line work is required).

Extended connection applications processing times are principally due to incomplete information, protracted negotiation of contracts, and the large number of applications being processed at any one time.

Considerations for the processing of applications include:

- Compliance with legislative and regulatory requirements (e.g. regulatory tests);
- External approval processes (e.g. environmental);
- Complexity of the application; and
- Impact of the application on other applicants and vice versa.

Network Management's access queue currently includes 4,500 MW wanting to connect before the end of 2012. There is insufficient load growth in the South West Interconnected System (**SWIS**) to justify this level of additional generation connection. Timeframes required to build necessary network infrastructure and complete required studies would not allow potential generators to bid in the IMO capacity auction. Network Management views this as an issue, as units at the end of the queue could potentially provide a better market outcome, but would be unable to proceed.

Network Management is of the view that the queuing policy leads to equal treatment of all technologies, regardless of their level of contribution/benefit to the electricity supply. This may lead to inefficient use of the network.

Network Management also suggests that additional peak-lopping generation could be used to avoid or delay network reinforcement in specific areas. However, this type of generation would also have to compete in the access queue.

2.4 The Authority invites comment on whether the risk that a network connection will not be delivered on time impacts on investment incentives, including incentives to invest in new facilities on particular parts of the network.

Network Management suggests that one way of dealing with network connection delivery risk is the use of liquidated damages. However, there are concerns around the risk it imposes on the business in certain instances. Further work would be required to ensure that the use of liquidated damages does not simply result in a transfer of risk from network connection delivery to Network Management.

For instance, if Network Management was to factor in an allowance in the customer's capital contribution to cover liquidated damages, then any over-recovery of revenue from the customer would be taken off Network Management's allowable revenue (given that Network Management's allowable revenue is fixed) resulting in a tariff decrease to other customers. Conversely, any under-recovery would be made up under the revenue cap resulting in other users picking up the shortfall via network tariffs. Network Management's huge works program over the next few years exacerbates the difficulty in providing guaranteed connection dates.

Network Management suggests that it does not make commercial sense to take on such risk, including the potential to jeopardise other projects and customer supply (existing and growth), without commensurate compensation.

Network Management has embarked on a balanced portfolio approach to delivery options of major capital to manage the connection risk.

2.5 The Authority invites comment on the determination of connection charges by Western Power, and the impact that these connection charges have on the effectiveness of the WEM. In particular:

- **to what extent do connection charges influence long-term investment decisions;**
- **do connection charges provide appropriate locational investment signals; and**
- **is there sufficient transparency and predictability in the calculation of connection charges for participants to respond to the signals in making investment decisions.**

Network Management assumes *connection charge* refers to the capital contribution determined by Network Management in relation to new network connections.

Capital contributions are determined in accordance with the approved Capital Contribution Policy and can relate to the cost of both network connection assets and shared network assets.

These charges can be significant and will clearly form part of the feasibility and bankability assessments of any generation project, which will have a direct impact on long-term investment decisions for new generation.

Whilst current connection charges provide locational signals, other considerations (e.g. fuel source and environmental approvals) may provide alternate and conflicting signals.

This variability results in extremely time-intensive processes to determine the extent of required network enhancements for the connection of new generation, and the associated scope of works for customer connections.

2.6 The Authority invites comment on whether network planning processes are sufficiently responsive to developments in the WEM and whether network planning decisions are sufficiently transparent to participants.

Network Management strongly suggests there is a need to consider network planning processes, beyond the short-term scope of developments in the WEM, as part of longer term State development plans to ensure the network is viable, stable and reliable, and caters for Western Australia's long term growth requirements.

Network Management is of the view that this can only occur if Government and industry collaborate to take a holistic State development view, ensuring long term infrastructure plans for Western Australia are considered in a collaborative effort to produce the best possible outcome. This will require a high-level approach across Government.

Such an approach should allow for issues related to fuel, environment, electricity and energy infrastructure to be considered with a view to determine suitable locations for future generation plant and industry. This would benefit industry by providing more reliable locational signals for future development and have a direct positive impact on economic growth in Western Australia.

As a result, Network Management could plan network development more accurately to cater for arising requirements. This would increase Network Management's ability to provide new generators with a greater degree of certainty around the capacity of the network to cater for their output upon project completion.

From a network planning perspective, Network Management suggests that, in addition to the large number of applications currently being processed, the uncertainty around which applications will proceed makes it increasingly difficult to plan for adequate network reinforcements.

Major projects often require a commitment to proceed (e.g. corridor selection and environmental approvals) ahead of customer commitment. Network Management suggests this presents the risk of premature investment commitments, or delays in other required works, if a different generation scenario eventuates.

Network Management further suggests that part of the responsiveness and transparency issue relates to confidentiality requirements from new network applicants. Increased transparency around the planning process to proponents would require the provision of more data on proposed generators from customers.

The planning process is also impacted by the queuing policy. Network Management currently has in excess of 4,500 MW generation connection proposals by 2012, which cannot all be expected to proceed due to insufficient load.

This level of excess plant proposals significantly increases the number of planning scenarios to be considered which in conjunction with confidentiality requirements leads to a complex environment.

2.7 The Authority invites comment on the extent to which the reserve capacity mechanism, along with other elements of the WEM, provides appropriate incentives for investment in a mix of new generation plant. The Authority is interested in specific factors that might have deterred potential new investment in the market.

Network Management has no comment to provide at this time.

2.8 The Authority invites comment on the appropriateness of the mechanism for determining the reserve capacity price. In particular:

- **does the reserve capacity price provide appropriate investment signals;**
- **would investment signals be improved by a shift to a reserve capacity price that is determined using a mechanism more closely reflecting market outcomes; and**
- **what, if any, barriers currently exist that would impede a shift to a reserve capacity price that is determined by the market.**

Network Management suggests that the potential for significant diversity in network reinforcement costs for connection at various points on the network makes it difficult to determine the level of network costs to be factored into the reserve capacity price. This could result in some projects being overcompensated, or undercompensated.

Additionally, a high reserve capacity price could result in excess generation capacity being installed, thus placing unrealistic time requirements on Network Management for the provision of network reinforcements. There is also a danger that Network Management may not have reinforced (or sufficiently reinforced) the network in the right location(s).

From an intermittent generation perspective, as peak loads on the SWIS typically coincide with extreme weather conditions, Network Management suggests that these generators will not contribute to meeting the peak, although they would have been granted significant capacity credits to do so through the Reserve Capacity Market.

This will have significant implications for network management as transmission capacity is constrained in virtually all of the areas that are amenable to wind generation and capacity upgrades will be required if the projects are to proceed. Generally, the costs of these will be prohibitive for individual projects, as under the Electricity Network Access Code, the cost of capacity upgrades must be recovered from the projects that cause them unless the upgrades are required to meet general load growth or to comply with safety or reliability requirements.

While this situation applies to all forms of new generating capacity, it will be more problematic for renewable projects, and particularly wind farms as these are more often located in areas of lower network capacity and have additional requirements to ensure system stability. This seems to indicate that the reserve capacity price does not provide appropriate investment signals.

In the longer term, Network Management suggests that a move from unconstrained to constrained access would assist in limiting overinvestment in the network. Although, this might be easier to implement in a heavily interconnected network and would require changes in market design, it would allow for the market to organically resolve issues associated with network constraint and minimise the potentially unsound network development driven by an unconstrained environment.

2.9 The Authority invites comment on the extent to which the methodology for calculating reserve capacity refund payments promotes the market objectives, particularly in regard to reliability of supply. In particular:

- **to what extent do participants respond to signals provided by the structure of reserve capacity refund payments; and**
- **if reserve capacity refunds reflected their impact on the market, how would this be expected to affect compliance or incentives to participate in the reserve capacity mechanism.**

Network Management has no comment to provide at this time.

2.10 The Authority invites comment on the effect of moving the STEM closer to real-time or of introducing multiple gate closures. In particular:

- **would this encourage greater participation in the STEM or improve outcomes in the STEM, including through improved price signals;**
- **would the benefits to participants outweigh the costs to participants; and**
- **what, if any, barriers are there to such a change and what do these barriers suggest for the timing of such a change.**

Network Management has no comment to provide at this time.

2.11 The Authority invites comment on the extent to which Verve Energy's exposure to forecasting errors in the balancing market impacts on the effectiveness of the market.

The Authority invites comment on barriers to the introduction of competitive balancing, and what these barriers suggest for the shift to more competitive balancing arrangements.

Network Management has no comment to provide at this time.

2.12 The Authority invites comment on the delivery of ancillary services, particularly in regard to the competitive delivery of ancillary services.

Network Management has no comment to provide at this time.

2.13 The Authority invites comment on the impact that wind energy will have on the effectiveness of the WEM. In particular:

- **to what extent, if any, will additional wind energy impose costs on the market, and will these costs be borne by the wind energy facilities or by other participants; and**
- **do the existing arrangements for network connection charges provide signals to wind energy facilities that reflect the impact of these facilities on the market.**

Variable and undispatchable sources of energy, such as wind, can have significant impacts on the management of an interconnected system and create additional costs and potential risks to the security and stability of supply. These costs should be identified, appropriately attributed to causers and users and efficiently recovered, with implications for the market rules, technical codes and funding arrangements.

Network Management suggests that the main impacts will be as follows:

- **Generator dispatch:** Except during times of peak demand, intermittent unscheduled generators can only be dispatched by displacing other plant. This can be a particular problem overnight when cogeneration units and baseload plant normally supply the load. As this plant is designed for continuous operation above certain levels of output, reducing production to accommodate intermittent generation will generally increase total generating costs in the short and long term and will result in lower efficiency of production.
- **Frequency control:** In order to maintain system frequency within the prescribed limits, aggregate generation and load must be kept in balance in real time. Consequently, instantaneous changes in highly variable sources of generation, such as wind, must be balanced as they occur. This is generally achieved by maintaining additional gas turbines in reserve to provide sufficient fast response capability to accommodate the positive and negative changes in wind generator production. Given the spasmodic operational requirements of the load following plant, it runs at very low efficiency and hence high cost, compared to more regular use. Based on data from the wind farms in the SWIS, Network Management estimates that for 200 MW of wind capacity, around 50 MW of gas turbine capacity would be required for load following purposes.
- **Other operational requirements:** Intermittent generation will also have specific requirements in order to maintain voltage control and fault recovery capabilities and to acquire and transmit the operational data needed to efficiently run the turbines and integrate them in the power system. These costs are typically borne by the project developers, but must be included in determining the overall financial impacts.
- **Network management and investment:** Locations for new plant are usually based on the availability of fuel sources, and in the case of renewable generation, these are typically in areas that have either constrained transmission capacity or are electrically “weak” (i.e. have limited ability to withstand additional power flows without producing large voltage variations or power quality disturbances). Virtually all of the areas where projects have been proposed will require significant capacity upgrades.

Given the potential magnitude of these impacts, it is vital that they are assessed through detailed system modelling. Based on the results of this, the market rules and regulatory arrangements should also be reviewed to ensure that they are consistent with and will support increased renewable penetration.

Network Management suggests that some savings could be made by assuming that intermittent generators and scheduled generators are not simultaneously operating at full output. However, this would involve the development and management of network constraints.

Running a constrained network would require Network Management to consider constraint management, which would require a market mechanism to determine which generator runs if both intermittent and scheduled generators were available.

Network Management suggests that the increased penetration of wind generation will also require an increase in the level of spinning reserve to cater for the intermittent nature of wind. Increased wind penetration will also tend to force off conventional generation overnight, which will increase the cost of generation as conventional generators would require a restart on the next day to cover system load.

2.14 The Authority invites comment on the incentives for DSM to participate in the market. In particular:

- **what, if any, barriers exist that would prevent the participation of DSM that could otherwise provide capacity at a price competitive with new generation; and**
- **would an alternative structure for payments for DSM, or an alternative treatment of DSM within the market, encourage the participation of DSM in a way that promotes the market objectives.**

Network Management suggests that a barrier preventing the participation of Demand Side Management (**DSM**) is the requirement for it to be appropriately valued with respect to network augmentations. Whereas this currently occurs on a case-by-case basis, the participation of DSM would require an overarching methodology allowing for a valuation that could be compared with other network and non-network solutions.

In terms of MW, Network Management is of the view that DSM capacity should be less or equal in value to generation given that the direct substitute of load reduction is additional generation capacity. Load reduction capacity achieved through DSM is generally less reliable than generation capacity because it depends on the ability of loads to reduce their demands.

As the risk of load reduction capacity being unavailable is greater than the risk of generation capacity being available, there could be a justification to value DSM capacity below generation capacity.

Network Management is of the view that DSM capacity should be appropriately valued and account for reliability and other risk factors.

2.15 The Authority invites comment on the rule change process and procedures, the consultation process for rule change proposals and the time taken to have a rule change proposal considered and finalised.

Network Management has no comment to provide at this time.

2.16 The Authority invites comment on whether System Management remaining within Western Power impacts on the effectiveness of the market and, if so, in what way.

Power system security and satisfaction of market objectives are key System Management objectives. Network Management is of the view that the ring-fenced position of System Management greatly enhances its ability to maintain power system security, without detracting from its ability to satisfy market objectives.

System security requires constant cooperation between Network Management and System Management systems/functions. The current location of System Management directly contributes to the effectiveness and quality of these interactions. These interactions will become increasingly important as capacity and fuel constraints become tighter and is emphasised in emergency situations.

Network Management is of the view that System Management has more incentive to operate the system efficiently as an integrated and ring-fenced entity within Western Power, and suggests that resulting benefits would include:

- Integrated accountability for Network Management;
- Integrated maintenance planning (thus minimising costs);
- Overall performance incentive;
- Best position to understand and manage system limitations; and
- Clear accountabilities for system reliability (accountability for planning decisions and responsibility for system failures).

There are a number of financial (systems and processes) and supporting function (Corporate Affairs and Human Resources) benefits resulting from this arrangement. Operating costs of System Management would rise sharply if the function was to be fully separated from Network Management.

In addition, Network Management attests that the current situation provides significant synergies in areas like network outage scheduling, data management and information sharing.

2.17 The Authority invites comments on measures to improve price transparency in the market.

Network Management and supporting Government agencies are currently undertaking a range of work to provide greater transparency and streamline processes, including a focus on increased price certainty with respect to network connection costs.

Network Management is currently not in a position to provide further details.

2.18 The Authority invites comments on what, if any, impact retail market arrangements have on the WEM, and what implications this has for the effectiveness of the WEM.

Network Management has no comment to provide at this time.

2.19 The Authority invites comment on the effect that the Ministerial Directions to Verve Energy and Synergy and the Vesting Contract have on outcomes in the market.

Network Management has no comment to provide at this time.

2.20 The Authority invites comment on the processes for planning the development of the market over the longer term. In particular:

- **to what extent do existing arrangements provide scope for, and transparency in regard to, the development of the market; and**
- **what aspects, if any, of the development of the market should be addressed in a more systematic manner, and in what forum.**

Network Management suggests that existing arrangements do not appear to provide much scope for market development, as the current market is unable to support efficient investment in new generation and the transmission network.

Network Management also suggests that any market design review would require reconsideration of current contractual arrangements.

Network Management is supportive of efforts to review and improve current arrangements and is of the view that broad stakeholder consultation would be required.