The Balancing and Load Following Ancillary Services Markets

Frequently asked Questions
On 1 July 2012 new Market Rules came into effect in WA’s Wholesale Electricity Market (WEM) that introduced competition to the Balancing and Load Following Ancillary Services (LFAS) markets. The following FAQs are designed to provide explanation relating to the background and initial impacts of the new markets and the market design changes.

What are Balancing and Load Following Ancillary Services and what do they do?

In the WEM, Balancing and Load Following Ancillary Services (LFAS) manage the differences between:

- scheduled output (generators’ net contract positions established the previous day via bilateral trades and short term energy market or STEM);
- actual generator output (including variable non-scheduled generation); and
- actual demand (which can vary due to weather and other factors).

Balancing is the quantity of electricity needed for System Management (the system operator) to match supply (generation) with demand (load) in real-time through dispatch of plant. Load Following Ancillary Service is the instantaneous following of system load, including picking up load ramp between scheduling steps and maintaining the frequency of electricity within the required tolerance ~50Hz.

Why was there a need to have new Balancing and LFAS Markets designed and implemented?

The concepts of the provision of Balancing and LFAS have always existed in the Market Rules. The significant change that occurred on 1 July was the removal of Verve Energy’s monopoly position as the sole provider of those services in the WEM, allowing Independent Power Producers (IPPs) to compete with Verve Energy to provide them.

The original wholesale market which commenced operation in 2006 opened up competition via a day-ahead energy market but left the State generator, Verve Energy, as the sole provider of balancing and load following services. This kept the complexity and costs of the initial design low however it also meant there was not a “level playing field” - the State generator continued to have different rights and responsibilities compared with other generators. This is unlike other wholesale market designs where all such functions are open to competition and all players face obligations to “keep the lights on”.

Prior to 1 July 2012, balancing prices were based on the STEM offers of all participants (although IPP facilities did not provide Balancing). Current market circumstances were not taken into account and provided no forward price.

LFAS prices were based on a proportion of the (old) balancing prices (MCAP) with the proportion set annually by the Economic Regulation Authority (ERA).

What were the main reasons for change?

Changing system and demand dynamics had started to place pressure on some aspects of the hybrid WEM design because:

- the short term energy market (STEM) was a “one shot” process that occurred a day ahead;
• there were limited IPP opportunities to participate in energy and ancillary services after STEM;
• the associated prices were not cost-reflective and there were clear pricing distortions for Balancing and deviations from contract positions (MCAP/DDAP/UDAP);
• the costs are likely to have been higher than they might otherwise be; and
• these price distortions were starting to impact on short and long-term incentives and decision making.

How did the changes come about?

In 2009 the State Government commissioned the Verve Energy Report which identified a number of shortcomings in the market design that needed to be addressed, including the need to introduce competition to the provision of Balancing and LFAS services. Following this report, in 2010 the electricity industry, led by the Independent Market Operator (IMO), initiated a working group comprising market participant representatives to consider and deliver on the required market design changes.

The IMO established a Market Evolution Program (MEP) to oversee implementation of the design changes. See also http://www.imowa.com.au/mep-overview

Following substantial industry and market consultation on the design changes to the WEM Market Rules, including input from the ERA and approval by the IMO Board and the Minister for Energy, the new Market Rules brought the final market design changes into effect on 1 July 2012.

What were the changes to the Market designed to do?

The changes to the Market around Balancing and LFAS were designed to make the provision of these services competitive, more efficient and cost-reflective by providing the opportunity for IPPs to compete in their provision but still retain Verve Energy as the default provider.

What are the main elements of the new design?

The new design:

• introduces competition to Balancing and LFAS markets;
• allows Verve to shift plant to stand-alone status (rather than within its portfolio);
• enables competition and cleaner pricing in balancing and load following but not in a way that requires major reform and change to systems and procedures;
• improves the “playing field”;
• provides better incentives for the investment in balancing-capable generation capacity;
• pushes the current hybrid market design as far as possible;
• provides regular market forecasts;
• creates the ability for generators to revise/optimise submissions;
• delivers marginal prices to reflect submissions and actual supply requirements; and
• allows for constrained on/off compensation where dispatch is inconsistent with price.
Has there been any cost/benefit analysis and if so, what were the outcomes?

At the beginning of the MEP, Sapere Research Group was engaged to undertake a cost benefit analysis (CBA) to assess the costs and benefits that would flow to the Market from the proposed new Balancing Market. Sapere’s cost/benefit analysis showed net benefits in the range $8.9 million to $24.8 million in today’s dollar from:

- IPPs being able to bid into balancing;
- further IPP generation from more timely information;
- further IPP generation from early returns from outages;
- savings from reductions in “turning down” base generation; and
- further qualitative competition and investment signalling benefits were also identified.

What are the benefits of the new Markets and what are they delivering to the WEM?

Although competitive balancing has only been operating for a short time, the IMO commissioned Sapere again to look at whether the benefits identified in the CBA were starting to materialise. Sapere has estimated that the benefits already delivered in the WEM in the first four months of operation are in the order of $5.1 million and has suggested that the benefits that would accrue once the two remaining benefits are able to be assessed (lower cost balancing capacity and early return from outages) will be approximately $15.3 million in the first full year of operation. In essence, early signs of the market are indicating that it is delivering some of the identified benefits. These trends are consistent with the long-term trends of increasing STEM and balancing traded quantities and reducing average prices.

The new markets are delivering:

- Clean prices:
  - All generation must be offered into the Balancing Market and is used to determine dispatch and price.
- Cost reflective prices:
  - IPPs compete on their actual costs.
  - Opportunity for others to provide ancillary service.
  - Downward price pressure.
- A more ‘fit for purpose’ IT system with an extended life.
- Increased transparency and information:
  - Load forecasts.
  - Available capacity (which take into account outages).
  - Plants commissioning.
  - Non-scheduled (wind) generation forecasts.
- Price-based dispatch of BMO.
- Based on real-time market conditions.
- Enhanced automation of information exchange between System Management, the IMO and Market Participants.
What results have been seen so far?

Balancing

Long-term average balancing traded quantities per interval have continued to increase since Market start in 2006, while average price per MWh has continued to decline over the same period. This data suggest confidence in market-based mechanisms for energy trading and that price discovery in WA continues to grow. This lends weight to the industry’s ongoing efforts to further increase competition in the WEM in WA.

<table>
<thead>
<tr>
<th>Balancing Quantity (average MWh traded per interval across month)</th>
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<tbody>
<tr>
<td><img src="image1" alt="Graph showing Balancing Quantity" /></td>
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<table>
<thead>
<tr>
<th>Balancing Price (average price/MWh per interval across month)</th>
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<tbody>
<tr>
<td><img src="image2" alt="Graph showing Balancing Price" /></td>
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Load Following Ancillary Services

The new markets are already proving to be a much fairer and more equitable system as for the first time. Participants are now able to be fully functional in the Market. To date one new entrant has
commenced operating in the LFAS market from the 27 February 2013 as it has completed technical upgrades to their generators to provide load following services.

**How have costs been impacted since the introduction of the new Markets?**

Initially monthly LFAS costs have been higher than pre-July 2012, with LFAS costs (capacity and market) of $6.8M. Monthly Load Following Ancillary Services (LFAS) costs (capacity and market) have continued to trend downwards since July 2012 to $4.9M in January 2013 ($6.8M in July, $7.6M in August, $7.7M in September, $4.4M in October, $4.8M in November, $5.1M in December and $4.9M in January).

Average LFAS prices in October reduced by 44% (up) and 51% (down) compared with September. Observed average LFAS final prices have fallen since October compared with prior months, which appears to coincide with the Verve Energy High Efficiency Gas Turbines (HEGTs) coming online and delivering LFAS. Average LFAS up prices have continued to trend slightly down to January, while average LFAS down prices have trended slightly upwards over the same period.

<table>
<thead>
<tr>
<th>Month</th>
<th>LFAS Up ($/MW)</th>
<th>LFAS Down ($/MW)</th>
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<tbody>
<tr>
<td>Jul-12</td>
<td>28.43</td>
<td>35.02</td>
</tr>
<tr>
<td>Aug-12</td>
<td>30.72</td>
<td>36.95</td>
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<tr>
<td>Sep-12</td>
<td>29.62</td>
<td>39.50</td>
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<td>Oct-12</td>
<td>16.60</td>
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<tr>
<td>Nov-12</td>
<td>15.67</td>
<td>22.68</td>
</tr>
<tr>
<td>Dec-12</td>
<td>15.74</td>
<td>23.33</td>
</tr>
<tr>
<td>Jan-13</td>
<td>14.10</td>
<td>23.33</td>
</tr>
<tr>
<td>Feb-13</td>
<td>10.64</td>
<td>16.64</td>
</tr>
<tr>
<td>Mar-13</td>
<td>9.35</td>
<td>17.44</td>
</tr>
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</table>

**Average LFAS Up and Down Prices**

*Note: The above prices are the variable component and do not include the capacity cost of LFAS as that methodology has not changed with the introduction of competition in LFAS*
What are the likely causes of the higher costs in July to September 2012?

- Winter plant outages reducing capacity available for Load Following.
- The commissioning of the Verve HEGTs was delayed to 22 September 2012.
- Lower system load levels generally make it more expensive to provide LFAS Down capacity as generation would be near to min-generation for some facilities.
- The change in pricing from proportion of MCAP to bid prices.
- The previously administered prices were not cost-reflective (set to low) with other components of the market absorbing this cost. The current prices maybe more reflective of the true cost of providing these services.
- Introduction on 1 July of carbon pricing mechanism affecting SRMC.
- Minimal competition in LFAS market from the 27 – Feb 2013 has shown the downward pressure this has on LFAS prices. Early stages of the market no competition was present as such there was no downward pressure on prices.

How are Load Following charges calculated and passed on?

The quantity of LFAS required in each half-hour Trading Interval is set by System Management (currently around 72MW LFAS up and down per Trading Interval). The price for each type of LFAS service in each Trading Interval is based on offers from eligible LFAS providers.

Load Following costs are calculated and charged on a monthly basis two months in arrears as part of Non-STEM settlement. The LFAS charges are allocated to retailers and non scheduled generators based on each retailer’s monthly aggregate demand as a proportion of that month’s total system load.

What does the IMO expect to happen in future?

Vigorous competition is already occurring in the Balancing market with IPPs securing a share of the Balancing market. It is the IMOs expectation that as competition grows, the balancing prices will continue to trend downwards.

While the arrival of the Verves HEGTs has led to lower average LFAS prices and costs. The market prices have shown that even with a single new entrant into the market LFAS prices dropped further in February 2013. It is anticipated that as competition increases, prices may fall further. One driving component of LFAS prices is the amount of LFAS required each interval, LFAS prices dropped significantly when the requirement dropped from 80 MW to 72MW of LFAS required in each interval. A more detailed review may lead to the quantity required to be reduced further, and therefore the associated costs would also decrease.

If your question has not been answered in the above FAQs, please email operations@imowa.com.au with your question and we will provide you with a response.