Rules Development Implementation Working Group (RDIWG)

Meeting No. 5: Meeting Notes

Location: Level 3, Governor Stirling Tower, 197 St Georges Terrace, Perth

Date: Tuesday, 2 November 2010

Time: 9.00am – 2.00pm

- Previous meeting's minutes
- Balancing Provision Options
- Balancing Price Formation
- MEP Program Summary
- Check against Action Points
- Workshop wrap up and general business

Independent Market Operator

Rules Development Implementation Working Group

Minutes

Meeting No.	4
Location:	IMO Board Room Level 3, Governor Stirling Building, 197 St Georges Terrace, Perth
Date:	Monday 11 October 2010
Time:	Commencing at 9.05 am to 2.10 pm

Attendees	
Allan Dawson	IMO (Chair)
John Rhodes	Market Customer
Corey Dykstra	Market Customer
Steve Gould	Market Customer
Geoff Gaston	Market Customer (proxy for Patrick Peake)
Andrew Everett	Market Generator
Shane Cremin	Market Generator
Andrew Sutherland	Market Generator
Phil Kelloway	System Management
Chris Brown	ERA
Paul Hynch	Office of Energy
Jenny Laidlaw	Minutes
Jim Truesdale	Presenter
Greg Thorpe	Presenter
Troy Forward	Observer
Douglas Birnie	Observer
William Street	Observer
Kieran Lee	Observer
Jacinda Papps	Observer
Apologies	
Patrick Peake	Market Customer

Item	Subject	Action
1.	**WELCOME AND APOLOGIES / ATTENDANCE** The Chair opened the 4th meeting of the Rules Development Implementation Working Group (RDIWG) at 9.05 am. An apology was received from: • Patrick Peake – Market Customer.	

Item	Subject	Action
2.	**MINUTES OF PREVIOUS MEETING** The minutes of RDIWG Meeting No. 3, held on 30 September 2010, were circulated prior to the meeting. The following amendments were agreed: *Page 2: Section 1: Welcome and Apologies/Attendance* • "Andrew Everett – Market ~~Customer~~Generator" *Page 4: Section 3: Realignment of Scheduling Day Timelines* • "~~*Action Point: The IMO to consider whether Verve Energy should also be providing Resource Plans to the IMO.*~~" *Page 4: Section 4: Presentation on Balancing Price Formation* • "In relation to formation of the balancing price, it was … Following discussion of these issues, and also the respective roles of DDAP/UDAP and the compliance regime in relation to Resource Plan adherence, the RDIWG: o asked if analysis could be undertaken to assess the extent to which MCAP and clean price differences were due to inclusion of IPP offers in the MCAP price curve versus potential inconsistencies between the calculation of the Relevant Quantity and quantities included in STEM offers; o agreed that inconsistency between quantities included in Relevant Quantity calculation and the MCAP price curve should be addressed; o agreed in principle that~~, conditional upon achieving competition in the provision of the balancing services,~~ the balancing price curve should only include balancing resources (i.e. clean pricing); and o agreed in principle that DDAP/ UDAP should be removed, or set to lower levels, better reflecting impacts on balancing requirements. The RDIWG discussed whether the introduction of clean pricing should be conditional upon achieving competition in the provision of balancing services and whether the removal or reduction of DDAP/UDAP could be progressed earlier. The RDIWG acknowledged the IMO's recommendation that these changes should not be pursued in isolation." Subject to the agreed amendments, the RDIWG endorsed the minutes as a true and accurate record of the meeting. *Action Point: The IMO to amend the minutes of Meeting No. 3 to reflect the points raised by the RDIWG and publish on the website as final.*	**IMO**
3.	**ACTIONS ARISING**	

Item	Subject	Action
	The actions arising are either complete or on the meeting agenda. The following exceptions were noted: **Item 3:** Mr Phil Kelloway proposed to give a presentation to the RDIWG later in the meeting, subject to agreement by Verve Energy to the use of its historical data. **Item 8:** The IMO is arranging to meet with the Bureau of Meteorology (BOM) to discuss options for the provision of weather forecasts. It was noted that the action point should refer to forecasts prior to 12.15 pm rather than 1:00 pm. **Item 9:** Ms Jenny Laidlaw advised that she had met with Mr Mark Cooper from DBP to discuss the nomination timelines for the DBNGP. It was noted that while the 4.00 pm nomination deadline is not a contractual obligation on participants, nominations are required by this time to assist DBP in its planning. At this stage the DBP timelines do not appear represent a critical barrier to changes to the Scheduling Day timeline. **Item 11:** Outstanding. **Item 13:** Underway. **Item 15:** Underway. It was noted that an initial presentation on the issue was on the meeting agenda. **Item 17:** Underway. There was some discussion about the preliminary analysis of load forecast accuracy provided by Alinta and distributed to RDIWG members prior to the meeting. It was suggested that the analysis should: • consider the extent to which the accuracy of the load forecasts was improved by using the later BOM forecast, rather than only considering the accuracy of the current forecasts; and • focus on the potential improvements to Synergy's load forecasts, as it has most of the weather sensitive loads. **Item 18:** Mr Kelloway advised that System Management receive wind forecasts for each location from the BOM at 2.00 am and 2.00 pm each day. The forecasts include half hourly values (probably interpolated from 4 hourly values) for wind speed and direction at 10 and 75 metres, in addition to temperature and pressure. It was agreed that the IMO should include options for wind forecast provision in its proposed discussions with the BOM, and that the relevant action point (8) for the IMO should be updated accordingly. **Item 19:** Outstanding. **Item 20:** Ms Laidlaw reported that the opening of the STEM submission window could be brought forward without difficulty. Submissions would need to be validated once the relevant outage and Ancillary Services details became available, using similar rules to those used in the conversion of standing STEM submissions. While the opening of the Resource Plan Submission window could also be	

Item	Subject	Action
	brought forward, this does not appear to provide any practical benefit to the market as most participants will require STEM Auction results to prepare a valid Resource Plan. **Items 21 and 22:** Outstanding. **Item 23:** Underway. Alinta has started submitting gross bilateral submissions. Griffin Energy is still submitting net submissions. The IMO will follow up with Mr Peter Ryan regarding the provision of gross bilateral submissions by Griffin Energy. **Item 24:** Underway. **Item 25:** Mr Jim Truesdale advised that further analysis was being undertaken and the results would be included in a discussion paper presented at the 2 November 2010 meeting. There was some discussion around the following points: • the impact of small Intermittent Generators, not participating in the STEM but submitting Resource Plans, on MCAP formation; • whether Resource Plans should be submitted for small Intermittent Generators; • early notification to System Management of changes to large block loads, for example when a large load will be out for maintenance; • delays in the notification of Forced Outages, and their potential impact on the provision of Balancing forecasts; • whether the notification of outages should be considered in the solution space. **Item 26:** Mr Chin Koay had advised the IMO by email that he did not recall the discussion in the last meeting on Resource Plans focusing on the benefit of Verve Energy providing Resource Plans to the IMO, or the raising of this action point. RDIWG members noted that some discussion had taken place on the question but were unsure about the action point. The action point has been removed.	
4.	**OVERNIGHT DISPATCH ISSUES** Mr Kelloway gave a presentation covering a series of Trading Days from October 2009 that demonstrated the current overnight dispatch issues. A copy of the presentation is available on the IMO website. The following points were discussed. • The presentation included two generators being off-line at Muja overnight. While it was quite common for one generator to be off-line at Muja during October, it is unusual for two to be off-line at the same time. If only one Muja generator had been off-line then it may have been necessary to decommit a generator. • The requirement for Muja units to operate on oil support at low generation levels makes this an expensive balancing option	

Item	Subject	Action
	for the market. However, as a mix of fuels is used System Management does not have the option to instead issue Dispatch Instructions to IPP generators. No Dispatch Instructions were issued on the night of 13/14 October 2009. • There was discussion about the stage of the STEM/balancing cycle at which the problem first became apparent, and why the problem was not remedied through the STEM. Some members suggested that the risk of uneconomic dispatch was a key issue. • On investigation it was found that, for the nights in question, the STEM price was around $15, indicating that the problem had not been predicted in the STEM. • It was noted that both NewGen and Griffin Energy Facilities were in a position to provide balancing assistance on the nights in question. • The costs and reliability implications of decommitting steam plant were discussed. • The value of balancing price forecasts was discussed. RDIWG members agreed that the solution to the problem involved bringing the units that can efficiently reduce their generation overnight into the balancing market.	
5	**BALANCING PROVISION OPTIONS** Mr Jim Truesdale gave a presentation on options for increasing participation in balancing support. A copy of the presentation is available on the IMO website. There was discussion around the following points: • the need for facility based submissions to achieve efficient balancing outcomes, by providing the necessary connection of facility, price and quantity; • the reasons why the market was originally implemented using Portfolio based submissions; • the ability of Verve Energy to provide facility based submissions; • the ability of Verve Energy to provide increment/decrement bids by facility relative to its Net Contract Position (NCP); • the ability of IPPs to provide facility based submissions; • the trend towards IPPs providing de facto facility based submissions through the registration of distinct Market Participants for individual facilities; • how load following arrangements would work under the various balancing options; • comparison of various contractual vs physical solutions; • the issue of impractical outcomes arising from the STEM and whether a more complicated STEM is warranted; and	

Item	Subject	Action
	• the need for balancing forecast prices and how they could be provided. It was agreed that the IMO should develop skeletal options on Balancing provision options for presentation to RDIWG members at the next meeting. RDIWG members are also to also provide details of their own ideas/suggestions to the IMO. *Action Point: The IMO to develop skeletal options to support increased participation in balancing, for presentation to the RDIWG at the 2 November 2010 meeting.* *Action Point: RDIWG members to email the IMO details of their suggested options to support increased participation in balancing.* *Action Point: The IMO to investigate with Verve Energy its ability to provide Facility based submissions and Facility based increment and decrement bids (relative to Net Contract Position) for balancing.*	**IMO** **All** **IMO**
6	**CAPACITY COST REFUNDS** Mr Greg Thorpe provided a presentation on Capacity Cost Refunds. A copy of the presentation is available on the IMO website. The presentation covered: • the role of the Reserve Capacity Mechanism and its success to date in meeting its objectives; • an overview of the operation of the Capacity Cost Refund arrangements, and the incentives provided to Market Participants; • the current fixed schedule of refund weightings, and the impact of not reflecting short term variations in reserve; and • the potential to implement a more dynamic schedule of refund weightings more sensitive to actual levels of reserve, and an assessment of the possible impacts of such a change. It was stressed that a guiding principle in the review and consideration of any consequential change to the Capacity Cost Refund arrangements has been that the benefits of the existing arrangements should not be compromised. The following points were noted/discussed: • how the potential changes would mainly impact high refund/low refund situations where the system risk does not match the current refund level; • whether there should be changes to the minimum and maximum refund levels; • whether the refund level for a Trading Interval would be determined ex ante, ex post or by some combination of both; • the extent to which Capacity Cost Refunds affect Market Participant decisions relating to maintenance planning;	

Item	Subject	Action
	• the extent to which the suggested changes might affect Market Participant decisions relating to maintenance planning; • the need for Market Participants to have visibility of expected refund levels to guide their maintenance decisions, and the availability of the relevant information including details of Forced Outages and the reserve position; • the potential impact on investors of the uncertainty of a dynamic refund schedule; • whether the refund paid by a Market Participant for a small downwards deviation should be limited to reflect the actual extent of the deviation; • issues relating to obtaining approval for Planned Outages during the summer months; • whether it was appropriate for baseload generators and peakers to be subjected to the same Capacity arrangements; • how the appropriate refund levels should be determined; • the impact of rising Capacity prices on generator insurance costs; • the original rationale behind the current weightings used for Capacity Cost Refunds; • options to provide estimates of system reserve to Market Participants; and • what should be done with Capacity Cost Refund payments that are not required to fund Supplementary Reserve Capacity requirements. RDIWG members agreed that the IMO should look further at the options for a more dynamic Reserve Capacity Refund mechanism. *Action Point: The IMO to investigate options for a more dynamic Capacity Cost Refund mechanism and present its findings to the RDIWG.* *Action Point: The IMO to investigate the original rationale behind the current weightings used for Capacity Cost Refunds, and present its findings to the RDIWG.* *Action Point: The IMO to investigate options for the application of Capacity Cost Refund payments and present its findings to the RDIWG.*	**IMO** **IMO** **IMO**
7	**GENERAL BUSINESS** There was no general business raised.	
8	**NEXT MEETING** Meeting No. 5 will be held on Tuesday 2 November 2010 (9.00am-2.00pm).	

Item	Subject	Action
9	**CLOSED:** The Chair declared the meeting closed at 2.10 pm.	

Background

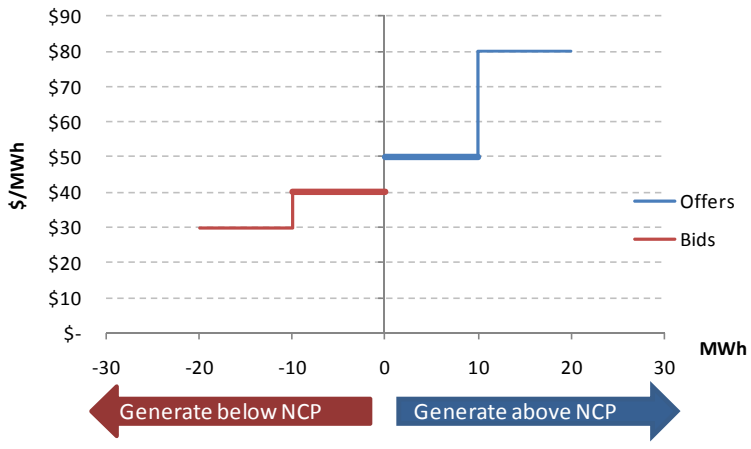
These notes have been prepared to assist members in considering further the ideas discussed at the last MDIWG meeting regarding balancing support options. Two high level approaches were identified, one a *contractual* (pre-dispatch) option; the other a *physical* (dispatch-based) option.

The following notes are necessarily high level. The aim is to provide an opportunity for members to consider the options and provide feedback/ suggestions in advance of discussion at the next MDIWG meeting.

Outline of contractual option

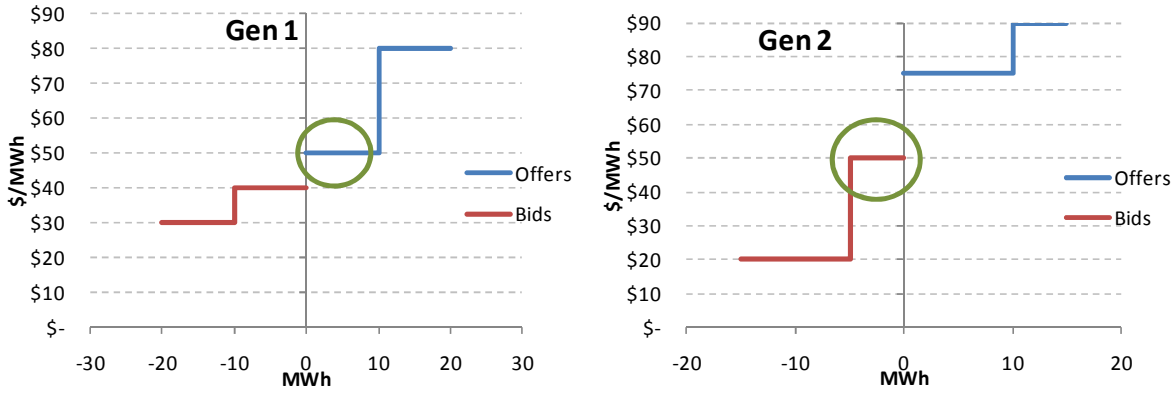
This could operate along the following lines:

- Following the STEM process, participants would have a net contract position (NCP) for each interval of the following trading day (as now)
- IPPs would submit facility resource plans setting out how they will meet their NCP commitment for each interval of the following trading day (as now)
- System Management would prepare an initial Verve dispatch plan (as now)
- A forecast of MCAP for each trading interval to the end of the following trading day would be published (being considered separately)
- Generators would submit offers or bids above/ below their established NCP for any interval(s) of the following trading day.
    - i.e. contractual balancing offers/ bids along the following lines (



- Verve could be required to submit offers and bids for each interval to ensure that options are available to the market
- The IMO would run an auction to clear offers and bids.

- For example, assume the following offers/ bids (with a simplified 2 generator example for 1 trading interval)
- The auction would result in Gen 2 *buying* 5 MWh (the circle indicating its bid to buy up to 10 MWh at $50 per MWh or less) from Gen 1 (which had offered to *sell* up to 10 MWh at $50 per MWh or more as indicated by the circle).
- In effect a balancing swap would be transacted between the two generators.



- The generators would each then submit updated resource plans (reflecting the auction results) to System Management for approval. i.e. the transaction would be contingent on system security criteria being met.
- If approved by System Management:
  - The relevant participant's NCPs would be adjusted reflecting the swap.
  - The generators would dispatch their facilities in accordance with their adjusted resource plans.
- Otherwise (if not approved) the transaction would not occur and the original resource plans would remain.
- The revised NCPs and resource plans would be treated in all respects as NCPs and resource plans. e.g. in relation to balancing payments for deviations from revised plans.
- An issue arises in relation to pricing:
  - Under a voluntary auction regime, there may not be any transactions.
  - Balancing prices would therefore continue to be set from STEM offers and any transactions executed under balancing support auctions would in effect be bilateral swaps (more like pay as bid than marginal pricing).
  - Compulsory participation could be considered as a mechanism for participants to effectively rebid balancing prices once STEM outcomes are known (the auction is different to STEM though as offers and bids are only incremental with respect to NCPs)

    - To limit cost impacts from compelling participation, it would probably be necessary to limit auctions to once or perhaps twice a scheduling day (depending on STEM timing).

- A voluntary regime though would mean participants could elect to participate if worthwhile and enable a more dynamic regime operating closer to real time.

    - For example, a *hit anytime* facility could be operated up to a predefined gate closure ahead of actual dispatch.

    - The closer to real time the cycle can be run, the more it would approximate (real time) balancing

Notwithstanding the last point above, this option is primarily directed at reducing the volume of balancing rather than facilitating participation in real time balancing. Balancing per se would still required.

Outline of dispatch based option

This could operate along the following lines:

- Following the STEM process, participants would have a net contract position (NCP) for each interval of the following trading day (as now)

- IPPs would submit facility resource plans confirming how they will meet their NCPs (as now).

- A forecast of MCAP for each trading interval to the end of the following trading day would be published (being considered separately).

- IPPs would submit incremental offers/ bids along the lines of those for the auction described above but by facility (i.e. indicating prices at which they are prepared to have facilities dispatched above or below resource plans and by how much).

- Herein lies the challenge – how to dispatch IPPs relative to Verve?

    - Verve's STEM submission is a portfolio-wide price curve (prepared in advance of the Verve dispatch plan prepared by SM, in turn dependent on demand/ wind forecasts and resource plans)

    - SM schedules and dispatches Verve using dispatch guidelines supplied by Verve. The guidelines are a form of merit order, with inter-temporal constraints regarding fuel, start-up/ shutdown criteria etc. i.e. the guidelines are not a set of discrete half hour facility based prices for SM to determine the order in which it dispatches facilities.

    - So somehow, it will be necessary to provide SM with guidance as to when to dispatch IPPs within Verve's internal merit order; or to externalise Verve's merit order on a facility basis for dispatch on the same basis as IPP incremental offers and bids.

- An option that could be considered would operate along the following lines:

- SM prepares the Verve dispatch plan (as now). i.e. it prepares the initial schedule for Verve facilities taking account of IPP resource plans, wind/demand forecasts, and Verve inter-temporal constraints, unit commitments.
    - **Note**: *whereas resource plans match NCPs, the Verve dispatch plan is based on expected demand less wind generation less the resource plans of scheduled generators. i.e. the dispatch plan prepared by SM implicitly represents Verve's NCP +/- expected balancing requirements.*
- Verve would then create a set of balancing offers and bids for all facilities that are capable of being dispatched above and below the dispatch plan.
    - **Note:** *actual balancing arises from any deviation from NCPs, so ideally the Verve dispatch plan would be based on Verve's NCP. Given that the Verve dispatch plan is effectively a schedule for 'planned' balancing it may be worth considering it as an adjusted Verve NCP from a settlement perspective. i.e. like a resource plan for 'planned balancing' and then dispatch and settlement relative to that would be more consistent.*
- IPP and Verve offers would then be ranked in ascending price order to create a balancing up merit order of quantities at specified facilities that are available to SM for dispatching (balancing) up. Similarly, bids would be ranked in descending price order to form a balancing down merit order.
- SM would dispatch participants up or down to balance the system using the balancing merit orders unless system security is threatened. SM would need the necessary tools to dispatch facilities in this manner.
- SM would not alter the Verve dispatch plan **except for system security purposes**. If this is necessary, all parties (or just Verve?) would be entitled to resubmit balancing offers/ bids for rest of the day.
- The price of the marginal facility dispatched for balancing would set the balancing price in each trading interval. If SM has to dispatch a facility out of merit for system security purposes, the relevant participant would receive its offer price (if dispatched up) or pay its bid price (if dispatched down).

Note: Electricity markets either use complex offers (incorporating physical limits and inter-temporal fuel, unit commitment parameters) or simple offers (price/quantity with minimal physical limits - e.g. just ramp rates). With complex offers, market scheduling, dispatch and pricing systems are more complex and the market makes unit commitment decisions based on the entire scheduling period. In contrast, with simple offers, participants are expected to make these decisions and reflect them in their offers. Accordingly they must be able to revise offers as circumstances alter. The option discussed above would ensure that SM could alter Verve's dispatch schedule for system security purposes. An issue is thus whether there would also need to be opportunities (rather than just for security purposes) for SM (on Verve's behalf) to alter the Verve dispatch plan, and/or for Verve to resubmit balancing prices.

From: Geoff Gaston
To: Courtney Roberts
Subject: RE: For review and comment: Balancing Option Outlines

Hi Courtney,

My comments below:

Balancing Options

In any form of revised balancing options, they key will be to get IPPs to be active in the process. In the current STEM, an IPP has no incentive to actively balancing around their NCP. The generator faces to great of risk in facing what can happen in the balancing market. To use Perth Energy/Western Energy as an example, if Perth Energy had a short position (ie having to purchase out of the "Spot" market") it cannot rely on having Western Energy cap the price of this position. If Western Energy has a STEM offer to cover Perth Energy's position and it does not clear, Perth Energy is exposed to MCAP because Western Energy is not in the merit order to be dispatched in balancing. This would be the same for any generator with an off take agreement to a customer. A generator would not choose to "turn down" and cover its position from the "Spot" market unless it knew with certainty that it would be called to balance at its nominated price to cover its risk.

Any change in STEM/Balancing must address the above issue.

Of the two options presented, only the second "physical" option comes closest. The "contractual" option in essence is a second STEM and generators will face the same issues as outlined above and will most likely not participate. Under the "physical" option, the true marginal price will set the balancing prices. The system will need to be set up in such a way that the generator will be assured that if they provide dec bids that the pricing in balancing will always settle at their dec bid price or below, or again the generator will not participate.

The paper did not outline how many times or how close to real time this bidding would take place. It would seem to me the closer to real time the more efficient the outcome would be.

Regards

Geoff

From: Dykstra, Corey
To: Courtney Roberts
Cc: Rizzi, Debra
Subject: RE: For review and comment: Balancing Option Outlines

Courtney

Please find below comments from Alinta.

Contractual Option

It appears to Alinta that the contractual option is not actually a balancing support option, but more akin to a 'second STEM window' to allow fine tuning of Market Generators' NCP. It is unclear that this acts to reduce the volume of balancing as stated in the document.

- No comment on the first three points.
- Point 4 - forecast of MCAP being published. It appears likely that the forecast would be largely consistent with STEM results as none of the other factors that affect MCAP, such as variance in intermittent generation, deviation from Resource Plans would be known until after the event.
- It is unclear that generators would submit offers or bids that differ to their STEM offers/bids, other than to optimise Resource Plans and potentially adjustments made as a result of changes to market conditions affecting SRMC (e.g. fuel cost and/or fuel availability).
- Alinta would support Verve being required to submit offers and bids to increase transparency.
- Compulsory participation has the potential to skew prices (much like STEM) dependent on generators' perception of risk and their preparedness to participate (not withstanding the obligation to price at SRMC where a generator has market power).
- The comment in regards to the need for balancing to be reduced as a result of close to real time cycles relates just as much to the STEM window as a balancing mechanism.

In general Alinta does not consider this option addresses the requirement to increase participation in the provision of balancing energy.

Dispatch Based Option

Overall, Alinta is attracted to the dispatch based option, although much of the detail is yet to be developed.

- Same comment as above in regards to forecasting MCAP.
- Not clear whether there would be a need for bids and offers to be facility based. As long as the Participant is able to provide the required balancing this should not have an impact.
- Alinta agrees that IPP and Verve offers should be ranked according to bids and offers, dependent on whether balancing requires a reduction or increase in generation.
- It would be useful to understand whether a Verve dispatch plan can be determined excluding their estimated balancing requirements. This would allow the market to be fully involved in balancing instead of on an incremental level.
- SM should not alter any dispatch plan except for system security purposes. If Verve is entitled to resubmit balancing offers/bids this would necessarily need to be offered to all parties to make the process fair and equitable.
- Setting the price based on the marginal facility dispatched for balancing makes sense. Alinta agrees that if SM is required to step outside of the dispatch merit order then this should be based on pay as bid price. This way, participants would have more control over whether or not they participate but ultimately all units should be able to do so if the system requires them to do so for system security purposes.
- Alinta doesn't consider that SM should be able to alter Verve's dispatch plan other than for System Security reasons.

- Alinta considers that the dispatch based option has more merit in addressing a competitive balancing requirement.

Kind regards

Corey

Corey Dykstra
Manager Regulatory Affairs

Level 9, 12-14 The Esplanade, Perth WA 6000
PO Box 8348, Perth BC WA 6849

T +61 8 9486 3749 **F** +61 8 9221 9128 **M** 0403 805 522
E corey.dykstra@alinta.net.au
W www.alinta.net.au

From: Steve Gould
To: Courtney Roberts
Subject: RE: For review and comment: Balancing Option Outlines

Hi Courtney.

Thanks for this, and sorry for not meeting the preferred deadline.

Contractual Model

I perceive the "contractual option" to be an effective means of smoothing dispatch profiles as a protection against acquiring an NCP with short duration troughs and valleys that disturb equilibrium running. For example, if a generator has an NCP of 70MW from 10:00 to 12:00, with a spike to 100MW from 13:00 to 13:30, it would be "valuable" to the generator (and the system via avoided Ancillary Service activity) to swap the spike with another generator.

I would emphasise the statement in the discussion document that the auction would be different to STEM as bids and offers are incremental to NCPs; in particular, while it is a valuable facility to remove a dispatch spike or infill a dispatch trough, the swap price might be very different from a fair-value MCAP and so the market ought not to see it as a revised MCAP. [I'm not clear from the proposal how the cash would flow, but I perceive that it would flow off-market between the affected parties?]

I agree that the success of this initiative would require Verve participation as otherwise it would lack the necessary liquidity. However, my feeling is that there would be no advantage to compelling IPP participation, it rather being a voluntary facility for them to optimize bumpy dispatch profiles and / or gain from Verve wishing to do so.

I perceive that a single run of this auction after the STEM wouldn't assist with balancing as when the STEM is run the system is presumed to be in balance and the sole purpose of a 1-run auction would be dispatch smoothing.

I perceive that this concept could contribute to balancing if transactions could occur at any of a series of gate closures prior to real time. For this to work, I perceive that Verve alone would have to be required to revise its bids and offers in response to improved forecasts, system contingencies and fuel changes, so that IPPs knew there is a market should they wish to participate. In effect, I perceive that this would require Verve to attach bids and offers to what are currently called “guidelines” provided to System Management to constrain the dispatch merit order.

I wonder also if there is merit in rather than running an auction, Verve continuously publishing, akin to a stockmarket, offers and bids for price-volume-duration blocks of, say XMWh with a start of 01:00 and finish of 04:00 at a price of $Y. For example, if a forecast indicates a 50% probability of a high wind / low load night occurring in 12 hours time, Verve can price on avoiding the risk of a turndown. Then, as we get closer to real time, the forecast – and consequences – become more certain. If an IPP likes an offering and is first to accept it, it gets it. Then the price gets reset. If no IPP likes the price, Verve has to either change the price or dispatch accordingly.

Dispatch Based Model

To my mind, the key point of this model is that the price of the marginal facility dispatched for balancing sets the balancing price, except when a facility is dispatched out of merit order for system security purposes. The proposal therefore takes care to identify that marginal facility and requires Verve to unbundle its prices for inclusion in an external price stack.

I see the logic of this approach, but I wonder whether the point is that a lot of out of merit order dispatch occurs in order to give Verve / System Management maximum effectiveness in balancing the system – especially overnight. In general, Verve /SM would have multiple options available to any particular set of system conditions and the choice would depend on subjective probabilities attached to particular outcomes versus the severity of the consequences of those outcomes. As such, the system might be better off by giving Verve “relatively expensive” flexibility to avoid “what might happen and what would be very adverse if it did”. Attached to this would be the means to unwind (through IPP participation) choices that the probabilities turn against. However, in this case, the “price” would effectively be driven by the cost of the “guidelines” given to System Management and would not be a proper balancing price.

Regards

Steve

Dr Steve Gould | General Manager Retail | Landfill Gas & Power Pty Ltd |
T: (+61) 8 9486 1864 | **F:** (+61) 8 9475 0173 | **M**: (+61) 0412 508 291 |
W: http://www.landfillgas.com.au

From: Andrew Everett
To: Courtney Roberts
Cc: Troy Forward; Brad Huppatz; Chin Koay; Wendy Ng; Jason Waters
Subject: Re: RDIWG - Comments on Balancing Option Outlines

Hi Courtney

Further to the comments circulated, Verve Energy adds the following observations: (I presume you will circulate them to RDIWG members as you have done with the others)

Contractual Option

We concur with Alinta and LGP that this option appears to be a second STEM window allowing participants to adjust their net contract position. It is not clear that there will be a worthwhile benefit in relation to balancing volumes.

1 a key issue will be the extent of participation
a. With the need to cycle the new Resource Plans through System Management the closest to real time for such balancing swaps will be a few hours before 0800 on the Trading Day. This will be pretty inconvenient time unless we change the Trading Day start time It will then be necessary to check the impact on other aspects of STEM scheduling and gas nomination
b. To conclude the process not too late within the Scheduling Day, say before 8:00 PM, will probably be the same as moving STEM a few hours later in the Scheduling Day
c. With these limitations the incentive for participating could be minimal - load and generator events happening post balancing swap closure will not be known and could not be covered
2 The cost could be significant:
a. IMO system to clear balancing swaps and settlement system to cover the trades
b. System Management system to validate second round Resource Plans
c. Participant system and manning costs
3 Verve Energy is also concerned that the initial System Management dispatch plan for Verve Energy's plant will not be close enough to real time dispatch to be a good basis for pricing. This will flow through the market as the balancing swap price will be used as the balancing price - as is currently the case

Dispatch Based Option

This appears to be pursuing a methodology very similar to the Option B market design considered earlier this year. It was decided at the July MAC meeting not to pursue that option as it is expected that the associated costs would significantly outweigh the potential benefits.

Notwithstanding, some additional observations:

1 A key concern is that this option could be less efficient than the current arrangement. Currently System Management can take into consideration load and generation events close to real time as they become known or anticipated. System Management then dispatches the Verve Energy fleet to suit ,even if it is doing this without generating cost information. (In contrast with the ideal situation where System Management will have not only Verve Energy fleet but also IPP generators). The proposal will provide System Management with a more rigid dispatch merit order (DMO) that covers both IPPs and Verve Energy. It would be expected that System Management would stick to this DMO unless there were clear system security issues for altering it . The resulting loss of flexibility, particularly the ability that System Management currently has to deal with changing circumstances , could quite possibly lead to a less efficient outcome. System Management's view on this would be very useful.

2 As for the Contractual Option, Verve Energy is also concerned that the initial System Management Verve dispatch plan will not be close enough to real time dispatch to be a good

basis for pricing

3 We have the same comments as for the Contractual Option in relation to participation and cost

In general, I think it would be a very useful exercise for System Management to do a presentation to the group on dispatch as it currently works, focusing particularly on the flexibility that System Management currently has and what issues are important to it. Perhaps, Phil Kelloway could be invited to do this. An appropriate explanation may assist RDIWG members to better consider the various balancing options that are being put forward.

Regards

Andrew Everett
Manager Regulation
Verve Energy

phone: (08) 9424 1836 | **mobile:** 0417 978 890 | **fax:** (08) 9424 1818 | **email:** andrew.everett@verveenergy.com.au

imo
Independent Market Operator

Independent Market Operator

Discussion Paper
Balancing Price Formation

Date: 29 October 2010

Contents

DOCUMENT DETAILS

Report Title:	Discussion Paper - Balancing Price Formation
Release Status:	Public
Confidentiality Status:	Public domain

Independent Market Operator
Level 3, Governor Stirling Tower
197 St George's Terrace, Perth WA 6000
PO Box 7096, Cloisters Square, Perth WA 6850
Tel. (08) 9254 4300
Fax. (08) 9254 4399
Email: imo@imowa.com.au
Website: www.imowa.com.au

1 PURPOSE

This paper has been prepared for the Rules Development Implementation Working Group (RDIWG). The purpose of the paper is to review pricing arrangements for prices related to balancing support in the WEM and, within the wider context of the RDIWG's work, to propose changes.

The roles of pricing and recovery of costs for the balancing support service and how they fit within, and affect, the broader set of market incentives have been discussed in a number of previous presentations and papers[1]. Familiarity with these issues is therefore generally assumed.

2 BACKGROUND

The RDIWG's terms of reference includes a group of design issues relating to the balancing mechanism:

> ***Group 1: Balancing Mechanism***
>
> 1. *There is very limited opportunity for participants other than Verve to participate in providing balancing services and this inevitably means the cost of balancing is higher than it needs to be.*
>
> 2. *Provisions for Balancing Support Contracts have not been effective to date.*
>
> 3. *The calculation of MCAP and the role of UDAP and DDAP mean that balancing prices are not cost reflective and this leads to inefficient incentives for decisions about prices and participation and inequitable financial transfers between participants that compromise the integrity of the WEM.*
>
> 8. *Lack of transparency inhibits the ability of Market Participants to optimise interaction in the daily energy market.*

This focus of this paper is on design issue 3 – the way in which prices relating to balancing support are formed in the WEM. In particular, the paper reviews the calculation of MCAP (Marginal Cost Administered Price) and the role of UDAP (Upward Deviation Administered Price) and DDAP (Downward Deviation Administered Price). While the focus of the paper is on pricing arrangements for balancing, this needs to be within the broader context of enhancing the balancing mechanism and increasing participation in balancing.

The remainder of this paper is structured as follows:

- Section 3 provides an overview of existing balancing support arrangements.

[1] For example, refer "Market Rules Design: Problem Statement" issued with the RDIWG Terms of Reference.

- Section 4 considers the design of pricing arrangements in an ideal world.
- Section 5 describes how prices related to balancing support are currently calculated and discusses issues arising.
- Section 6 presents analysis of the issues identified in section 6.
- Section 7 considers options for addressing the design issues.
- Section 8 recommends changes to pricing arrangements, within the wider market development context.

3 Overview of Balancing Support Arrangements

In the WEM, most electricity is accounted for commercially well in advance of dispatch. i.e. through bilateral contracts, self-supplied load or the day-ahead Short Term Energy Market (STEM) facilitated by the IMO. On the trading day, participants are expected to operate in each trading interval to the Net Contract Positions (NCPs) they have established following the STEM.

As contractual commitments are formed well in advance of dispatch, actual supply and demand within a trading interval will inevitably differ from contractual commitments. For example, due to facility outages, demand and wind forecasting uncertainties etc. Balancing support services are therefore required to manage energy mismatches that arise within each trading interval. Physically, SM 'balances' the system through the dispatch process[2]. Commercially, imbalances are settled after the event by the IMO.

From a physical perspective:

- IPPs commit and dispatch their facilities (subject to SM system security requirements). They confirm how they will do this in their Resource Plan submissions.
- SM schedules and commits Verve Energy facilities to meet expected overall generation requirements (taking demand and wind generation forecasts and IPP Resource Plans into account).
- SM dispatches Verve facilities in real time, physically balancing the system.

Verve Energy is thus the default provider of balancing support in the WEM. Opportunities for IPPs to provide balancing support are limited to dispatch by SM for system security purposes or to avoid dispatching Verve liquid fuelled facilities (using non liquid fuelled IPP facilities).

From a commercial perspective:

[2] Real time imbalances within each trading interval are managed by ancillary services such as load following.

- A Marginal Cost Administered Price (MCAP) is established in each trading interval (discussed later).
- Verve receives MCAP for energy it generated above its NCP, to compensate it for providing additional energy above its NCP (balancing up).
- Verve pays MCAP for energy generated below its NCP, having avoided the cost of generating (balancing down).
- IPPs receive an Upward Deviation Administered Price (UDAP) for energy they generated above their Resource Plans (unless instructed to do so by SM, in which case they receive their specified balancing up price). UDAP is MCAP modified by a penalty factor depending on the time of day.
- IPPs pay a Downward Deviation Administered Price (DDAP) for energy they generated below their Resource Plans (unless instructed to do so by SM, in which case they pay their specified balancing down price). DDAP is MCAP modified by a penalty factor.
- Intermittent generators receive (pay) MCAP for energy they supplied above (below) their net bilateral position.
- Market customers pay (receive) MCAP for the amount of energy they drew above (below) their NCPs.

Residual sums (for example due to differences between DDAP/UPAP and MCAP) are prorated to market customers.

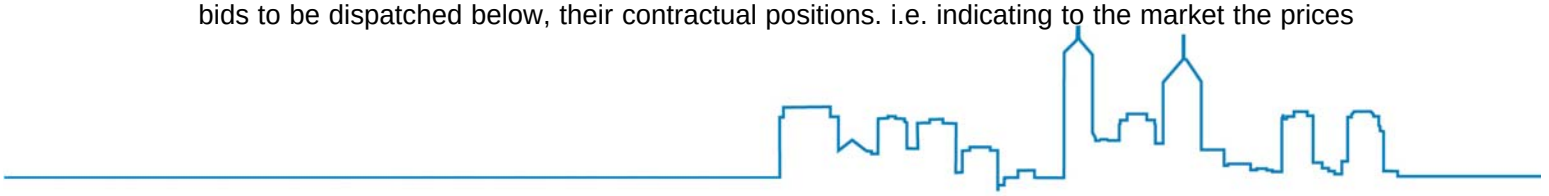
4 Pricing Principles

Before considering how prices relating to balancing support are established in the WEM, it is helpful to consider balancing and pricing from a first principles perspective. In an ideal world:

- All participants would be able to compete on price to provide balancing support services;
- The balancing price would be cost reflective; and
- Those contributing to balancing requirements would face the costs they impose on the system.

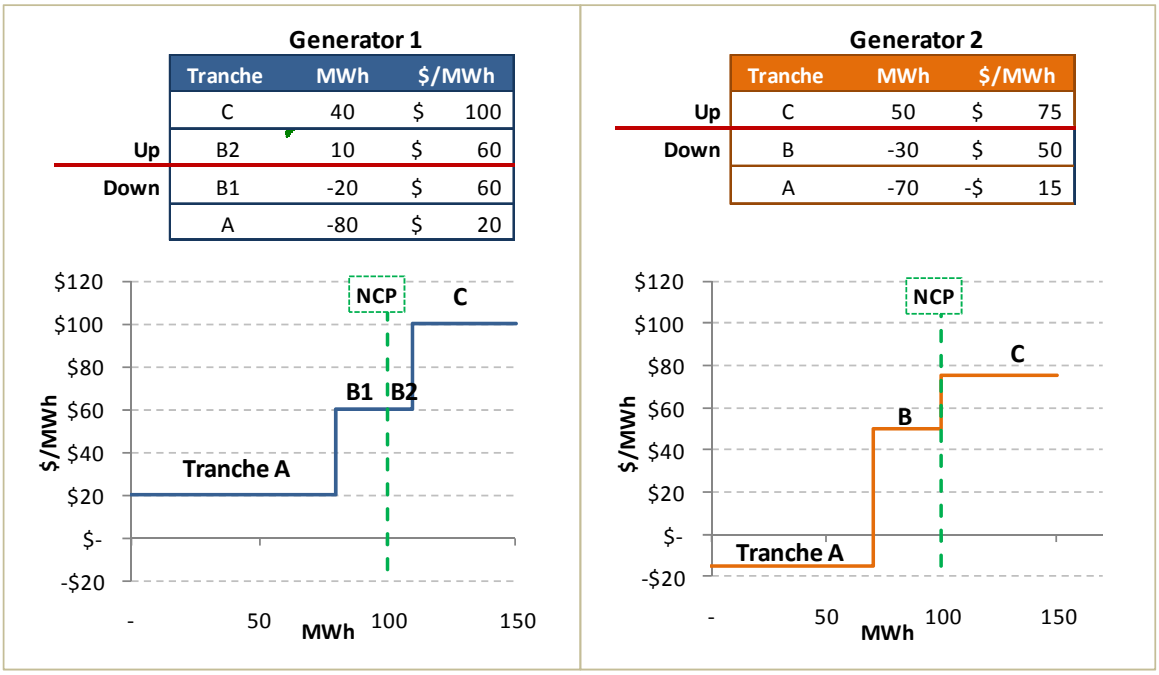
This would minimise the cost of balancing in the short term. By accurately signalling to investors the value of flexibility and the cost of managing imbalances, it would also help to minimise long term electricity supply costs.

Ideally, participants would be able to submit price-based offers to be dispatched above, and bids to be dispatched below, their contractual positions. i.e. indicating to the market the prices



at which they are prepared to be dispatched above or below their contractual positions and by how much. For example, as indicated in Figure 1 for a simplified market with two generators, each with single facilities. Suppose their supply curves relative to their NCPs as shown.

Figure 1: Balancing offers and bids – stylised example



For Generator 1, the tranches indicate that:

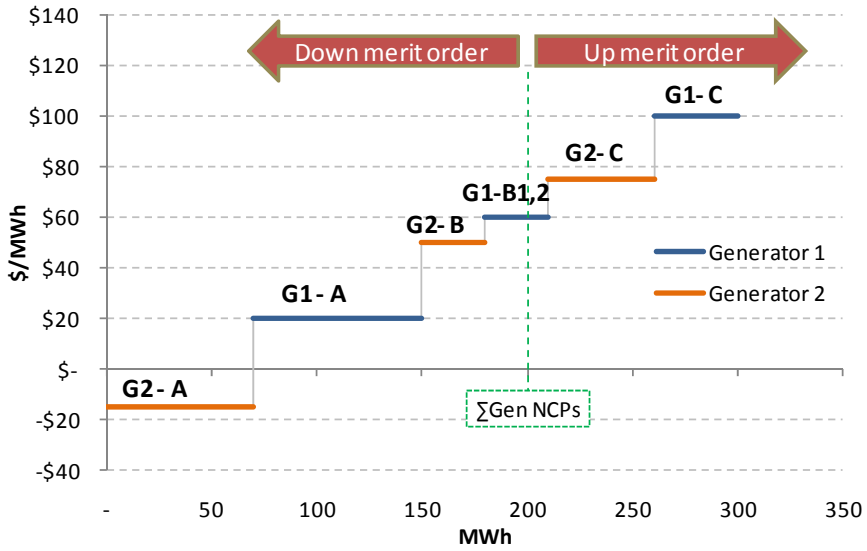
- It is prepared to pay $60 or less to be dispatched below its NCP by as much as 20 MWh (tranche B1). i.e. it would be more cost effective to not generate and buy energy from the balancing market instead.
- It is prepared to pay $20 or less to be dispatched even further below its NCP, by as much as an additional 80 MWh (tranche A).
- It is prepared to be dispatched up to 10 MWh above its NCP if the price it receives is $60/MWh or more (tranche B2). i.e. that price would ensure that it covers the additional costs it would incur.
- It is prepared to be dispatched even further above its NCP, as much as an additional 40 MWh, if the price it receives is $100/MWh or more (tranche C).

Generator 2's curve can be interpreted in a similar manner, with two notable points. Firstly, at a price of $60 per MWh, generator 1 is indifferent to being dispatched within specified amounts above or below its NCP (tranche B). In contrast, generator 2 is less willing to be dispatched

above/ below its NCP. Secondly, generator 2 would want to be paid at least $15/MWh[3] to be dispatched below its NCP by more than 30 MWh. e.g. to recover de-commitment costs.

The market would then construct balancing up and balancing down merit orders by aggregating offers in ascending price order and bids in descending price order as depicted in Figure 2.

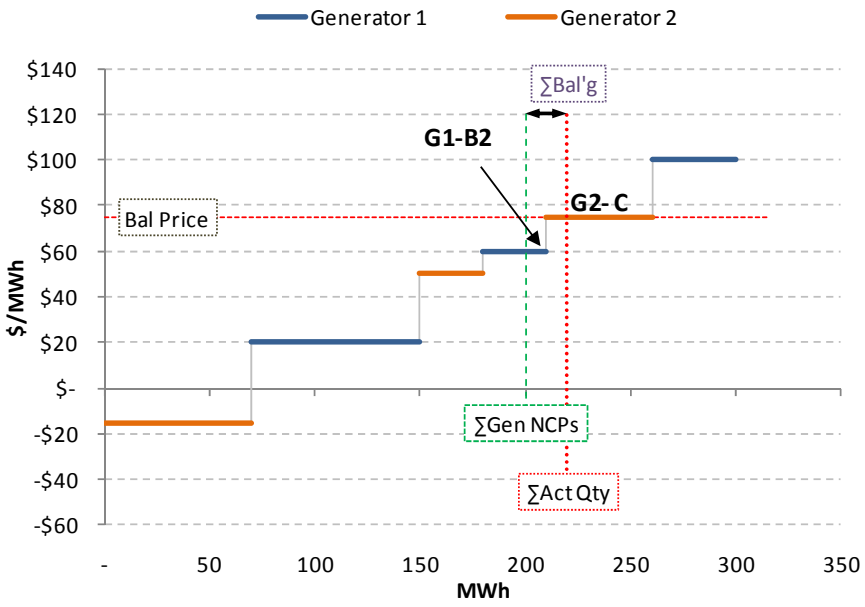
Figure 2: Balancing dispatch merit order



SM would use the balancing merit orders to determine the order and amounts by which it dispatches the generators' facilities above or below their contractual positions (i.e. Resource Plans). For example, consider an overall balancing requirement of 20 MWh upwards as illustrated in Figure 3. i.e. the actual quantity of energy required is 20 MWh above the contracted amounts.

[3] i.e. a price of –ve $15/MWh for tranche A means a payment of $15/MWh for being dispatched down

Figure 3: Dispatch and Pricing



SM would dispatch Generator 1 up 10 MWh (tranche B2 quantity) and Generator 2 up 10 MWh (part of tranche C). The balancing price would be set at $75/MWh, the marginal cost of balancing indicated by the price of Generator 2's tranche C offer. Each generator would receive this price for their 10 MWh contributions to balancing support, reflecting the marginal value of their contributions. The parties causing the need for balancing support would pay this price, reflecting their marginal impact on system costs.

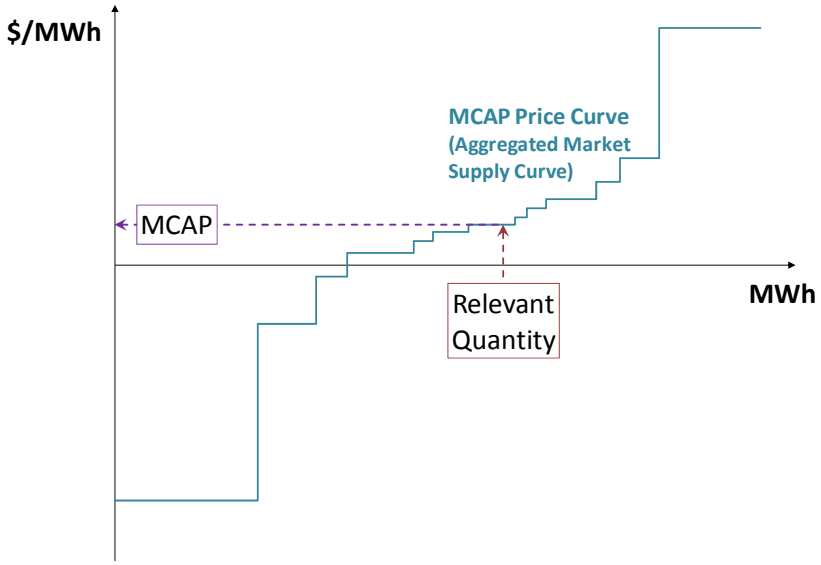
In practice, the provision of balancing support in the WEM is not a contestable service; dispatch and pricing are not organised in the above manner; and generators that deviate from Resource Plans face a modified balancing price.

5 Current Pricing Arrangements

5.1 Background

The WEM balancing price for each trading interval is determined from the intersection of the 'Relevant Quantity' and the 'MCAP price curve' as illustrated in Figure 4.

Figure 4: MCAP Price Formation



The Relevant Quantity (explained later) is a measure of actual energy supply requirements in the trading interval.

The MCAP price curve is a market-wide supply curve formed by aggregating participant STEM supply curve submissions. It could be likened to a day ahead balancing merit order. However, there are differences:

- The aggregated supply curve represents all generator STEM supply curves but only Verve facilities are able to be dispatched for balancing support.
- Supply curve submissions are by portfolio, not by facility.
- Verve is dispatched by SM using guidelines supplied by Verve, without reference to Verve's STEM supply curve submission.
- Verve submits its supply curve well before it sees the dispatch plan for its facilities prepared by SM (which takes account of Resource Plans and more up to date demand and wind forecasts).

There are also inconsistencies between some of the quantities included in the Relevant Quantity calculation and those in the MCAP price curve.

As a result, MCAP is not always consistent with the dispatch and cost of Verve's facilities. This can over or under compensate Verve for the service it provides and inaccurately signal the costs of balancing support. On the other hand, the cost of balancing is likely to be higher than if all generators were able to be dispatched for balancing support. The situation is further

compounded by the way in which balancing support costs are allocated to generators that deviate from their Resource Plans contributing to balancing support requirements. These issues are discussed below.

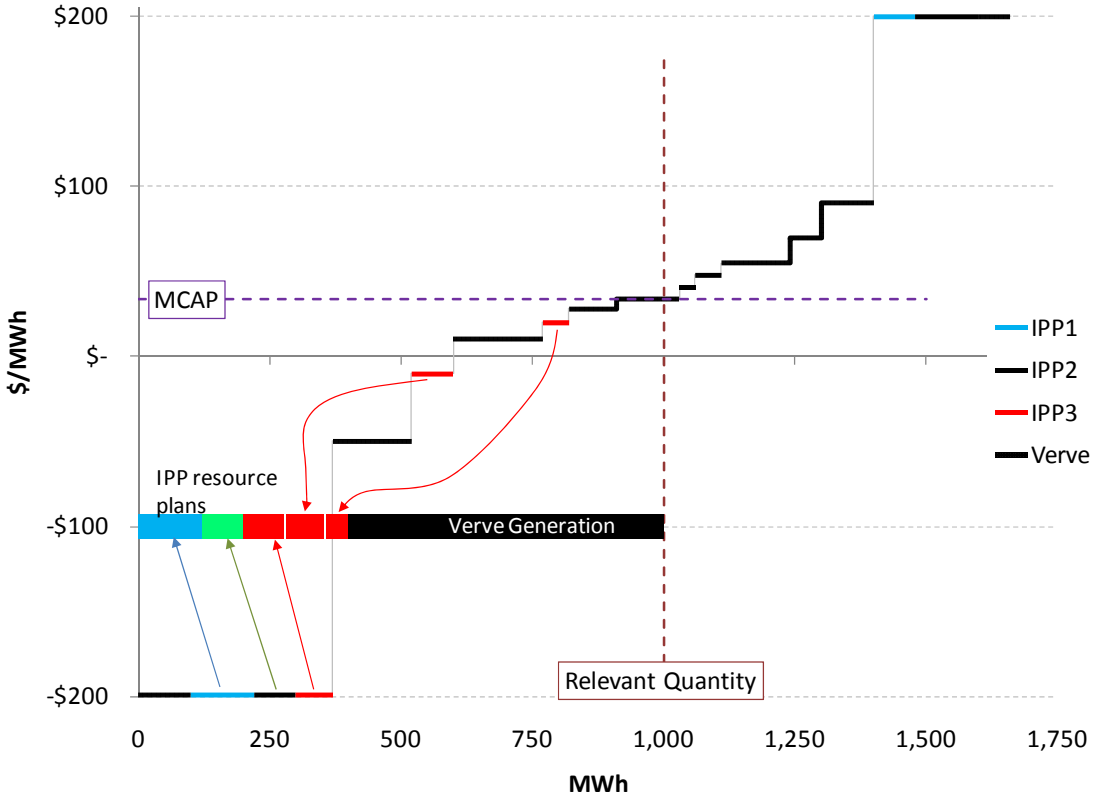
5.2 MCAP Formation Issues

The Relevant Quantity is nominally[4]:

Verve actual generation
\+ *Sum of Resource Plans*
\+ *Sum of Resource Plan Shortfalls*
\+ *Estimated Demand Curtailment*

Assuming no demand curtailment or Resource Plan Shortfalls, then the Relevant Quantity equals Verve actual generation plus the sum of IPP Resource Plans. Figure 5 illustrates how MCAP is formed in this instance.

Figure 5: Stylised Example of MCAP Calculation



[4] All quantities are loss adjusted quantities to the same reference point.

As illustrated, the quantities in IPP Resource Plans can be matched to quantities in their STEM supply curve submissions with prices below the MCAP price. In this regard, the MCAP price curve and the Relevant Quantity are therefore established on a consistent basis.

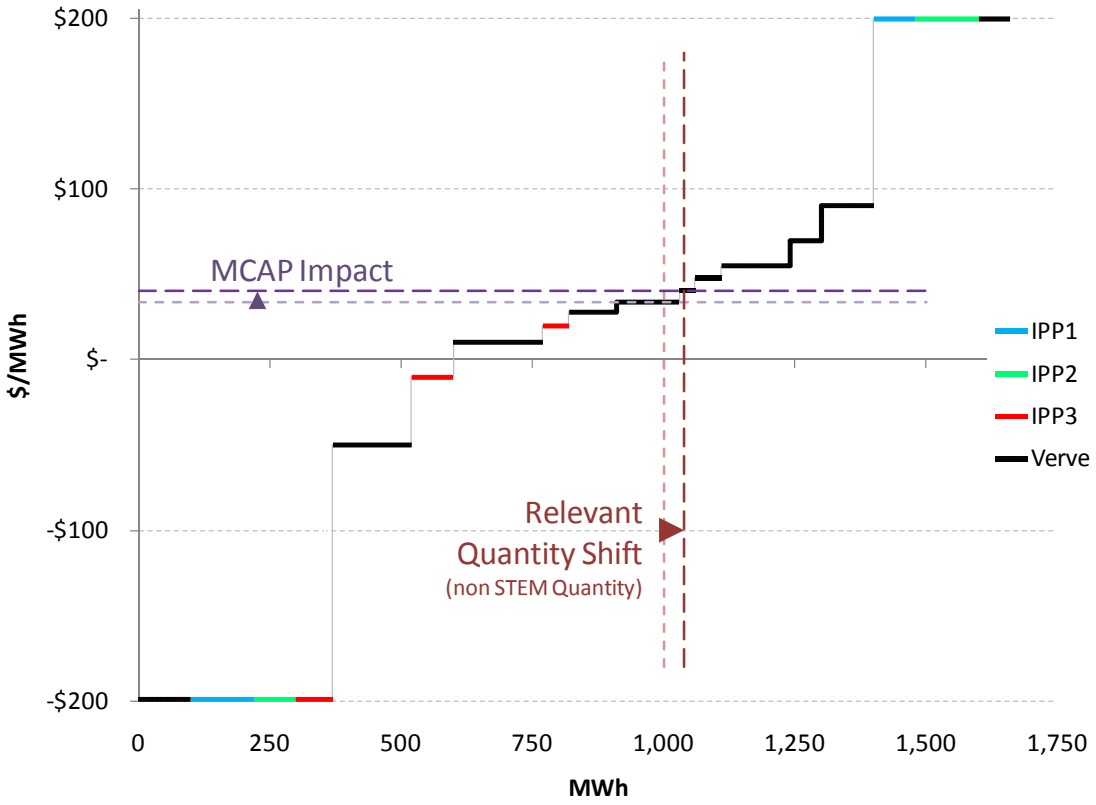
Further, for this example, if an IPP were to deviate below its Resource Plan, Verve would be dispatched upwards by SM, balancing the system. The Relevant Quantity would increase by the amount of balancing energy supplied by Verve, impacting on MCAP in a consistent manner. Similarly, suppose one of the IPPs had declared a Resource Plan Shortfall. This would have been included in the Relevant Quantity in the same manner. All else being equal, Verve generation would have increased to cover the shortfall and the Relevant Quantity would thus have increased by the same amount. Again, the Relevant Quantity would increase in a consistent manner relative to the MCAP price curve.

In practice, the above examples do not always hold and inconsistencies frequently arise. These generally fall into two categories.

Category 1

The first category relates to inconsistencies between Resource Plan quantities and IPP supply curve submissions. For example, Figure 6 builds on the previous example showing how the inclusion of IPP capacity in a Resource Plan that was not in STEM supply curve submissions can cause MCAP to be higher than otherwise.

Figure 6: Impact of Quantity In Resource Plan But Not In STEM Supply Curve



Analysis of historical data from April 2009 to September 2010 suggests that this effect is particularly prevalent, although not always affecting MCAP. For example:

- A number of smaller generators that do not make STEM submissions submit Resource Plans and/or Resource Plan Shortfalls. This can cause MCAP to be higher than the cost of balancing indicated by Verve's portfolio supply curve.
- Some participants submit Resource Plans but do not always submit STEM supply curves. This can also cause MCAP to be higher than the cost of balancing indicated by Verve's portfolio supply curve.
- Some participants Resource Plans not always consistent with their STEM supply curve submissions. This effect can cause MCAP to be higher or lower than the cost of balancing indicated by Verve's portfolio supply curve[5].

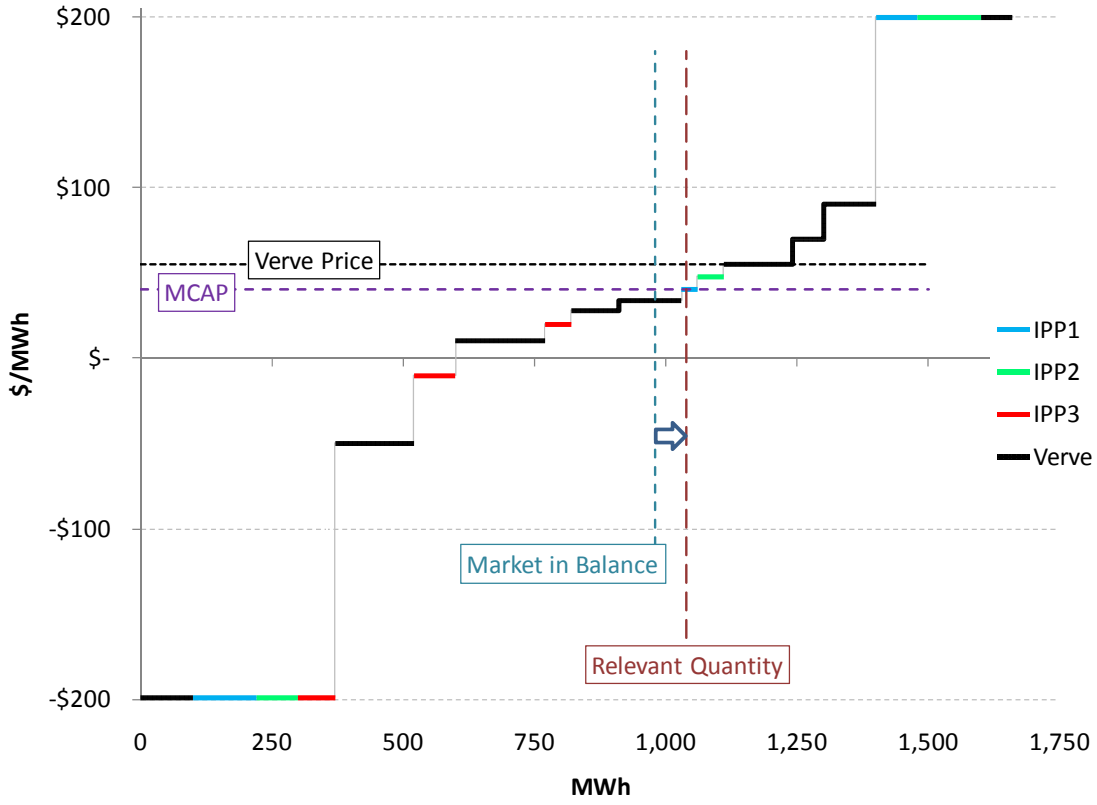
It is important to note that the focus here is on potential distortions to the balancing price. That aside, it is also important to remember that Resource Plans and Shortfall information increase the information available to SM for scheduling purposes.

[5] i.e. quantity in the supply curve priced at less than the STEM clearing price is less than or greater than the quantity submitted in Resource Plans and/or Shortfalls.

Category 2

The second category relates to situations where the IPP tranches lie between the balanced market position and the Relevant Quantity. Figure 7 shows an example where Verve is being dispatched upwards to provide balancing support. The amount of balancing supplied by Verve is reflected in the Relevant Quantity but MCAP is set at the price of an IPP1 tranche that is not able to be dispatched. In this instance MCAP, is lower than the cost of balancing indicated by Verve's portfolio supply curve.

Figure 7: Example of IPP Tranche Setting MCAP (Verve Balancing Upwards)

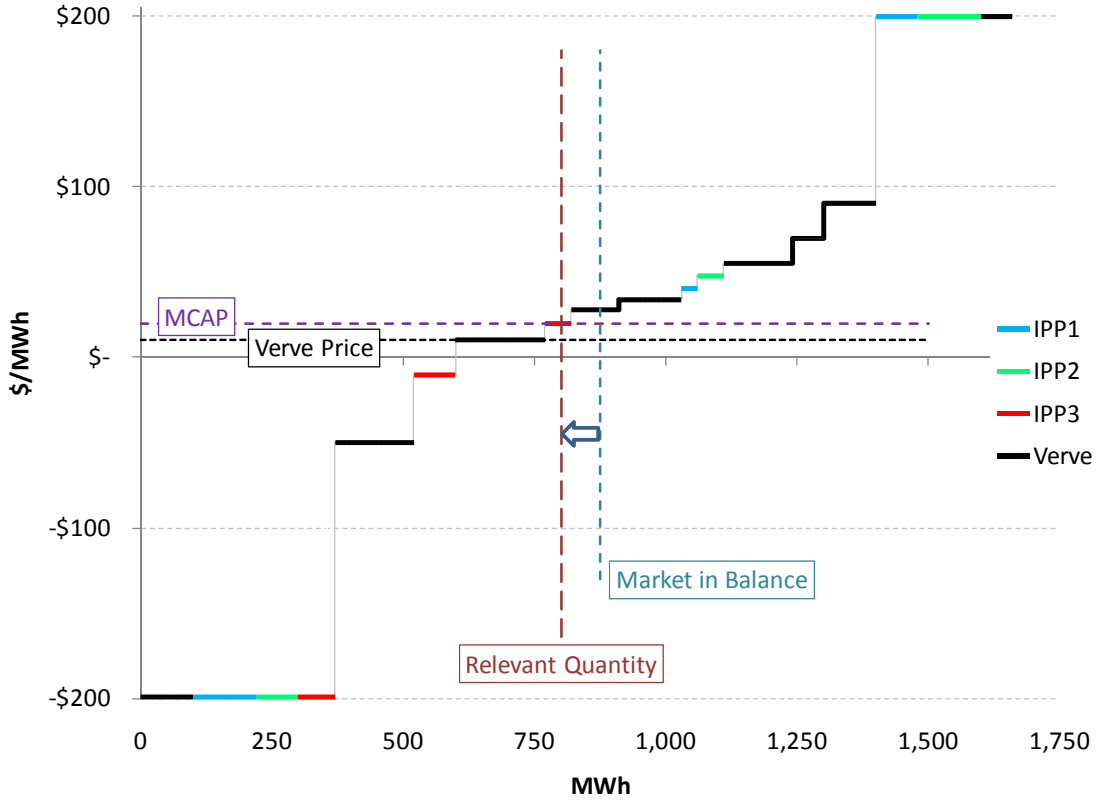


If additional balancing up energy had been required, MCAP could have been set by an IPP2 tranche and ultimately, for part of the next Verve tranche, MCAP would have been the same as the Verve price. Beyond that differences could arise again due to the ongoing impact of the IPP1 and IPP2 tranches on the Relevant Quantity. Thus, when balancing up energy is required, this effect may cause MCAP to be lower than the Verve price, but by itself not necessarily.

This effect can also cause MCAP to be higher than indicated by Verve's portfolio supply curve. For example, Figure 8 shows an example where Verve is being dispatched downwards to provide balancing support. In this instance, an IPP tranche causes MCAP to be higher than the cost of balancing indicated by Verve's portfolio supply curve. If Verve had been dispatched

lower, MCAP could have been set by the Verve tranche to the left and MCAP would have been the same as the Verve price. As for balancing upwards, MCAP and the Verve price may or may not align depending on the size and position of the IPP tranches that were not able to be dispatched. With reference to the idealised arrangements discussed in section 4, this also highlights one of the potential benefits of getting IPPs into the balancing merit order.

Figure 8: Example of IPP Tranche Setting MCAP, Verve Being Dispatched Downwards



Analysis of these issues is presented in section 6.

5.3 DDAP/UDAP

When generators deviate from their Resource Plans, they pay DDAP (for downward deviations) and receive UDAP (for upward deviations)[6]. DDAP and UDAP are calculated by applying penalty factors to MCAP to incentivise their compliance with Resource Plans. During peak trading periods, DDAP is set 30% above MCAP[7] and UDAP is set to 50% of MCAP. In other periods, DDAP is set 10% above MCAP and UDAP is set to zero. This means that DDAP and UDAP are not reflective of balancing support costs (whether MCAP is or not). An alternative approach could be to remove the penalty factors, or reduce them, and rely on the

6 i.e. for deviations in excess of dispatch tolerance.
7 Subject to price caps.

compliance regime as is more typical in electricity markets. There is a trade-off of course. Moving to more cost reflective payments for receiving support from balancing would mean that participants see the costs of their system impacts. On the other hand, DDAP and UDAP penalties incentivise compliance with Resource Plans. Removing the penalties may increase surveillance and enforcement requirements and reporting requirements for participants.

5.4 RDIWG Consideration

The RDIWG discussed MCAP formation and the respective roles of DDAP/UDAP and the compliance regime in relation to Resource Plan adherence at its meeting on 30 September 2010. Following that discussion, the RDIWG:

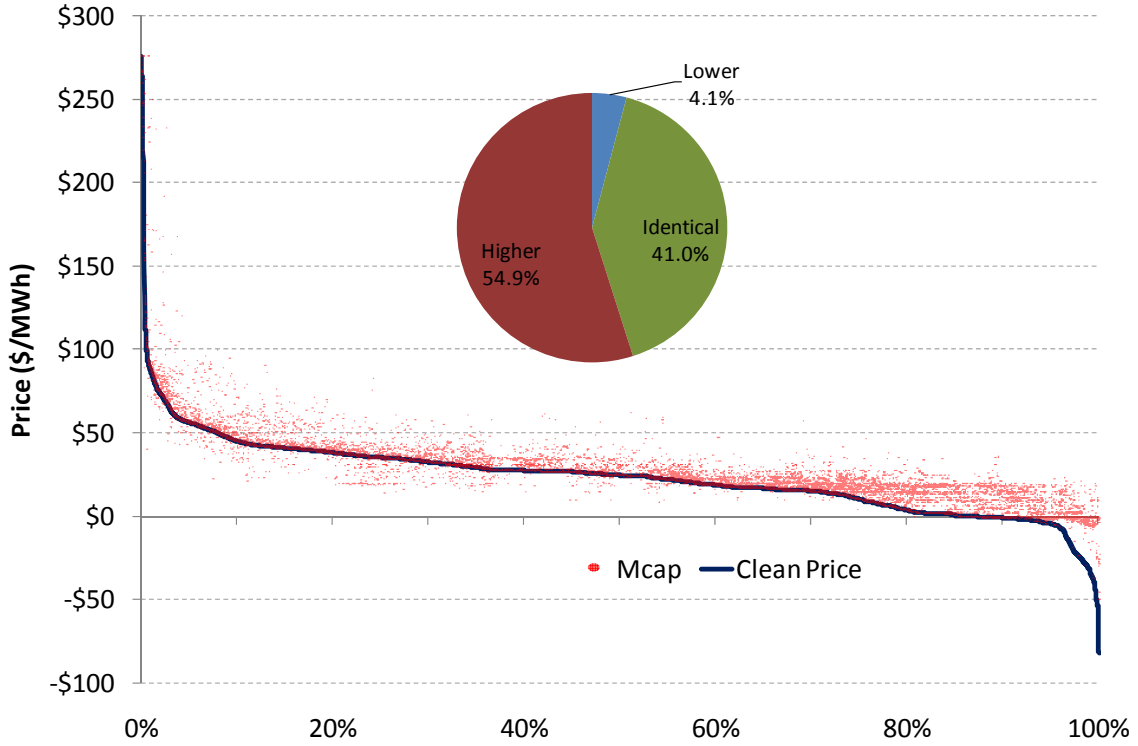
- asked if analysis could be undertaken to assess the extent to which MCAP and clean price differences were due to inclusion of IPP offers in the MCAP price curve versus potential inconsistencies between the calculation of the Relevant Quantity and quantities included in STEM offers;
- agreed that inconsistency between quantities included in Relevant Quantity calculation and the MCAP price curve should be addressed;
- agreed in principle that the balancing price curve should only include balancing resources (i.e. clean pricing); and
- agreed in principle that DDAP/ UDAP should be removed, or set to lower levels, better reflecting impacts on balancing requirements.

The RDIWG discussed whether the introduction of clean pricing should be conditional upon achieving competition in the provision of balancing services and whether the removal or reduction of DDAP/UDAP could be progressed earlier. The RDIWG acknowledged the IMO's recommendation that these changes should not be pursued in isolation.

6 Analysis of Balancing Prices

It is possible to assess the combined impact on MCAP of Relevant Quantity inconsistencies and interspersed IPP tranches. That is, by comparing historical MCAP values to the balancing price indicated by the intersection of Verve's loss adjusted generation and the Verve portfolio supply curve. The results of this analysis for the year ending 30 September 2010 are summarised in Figure 9.

Figure 9: Actual MCAP vs Verve Curve Price



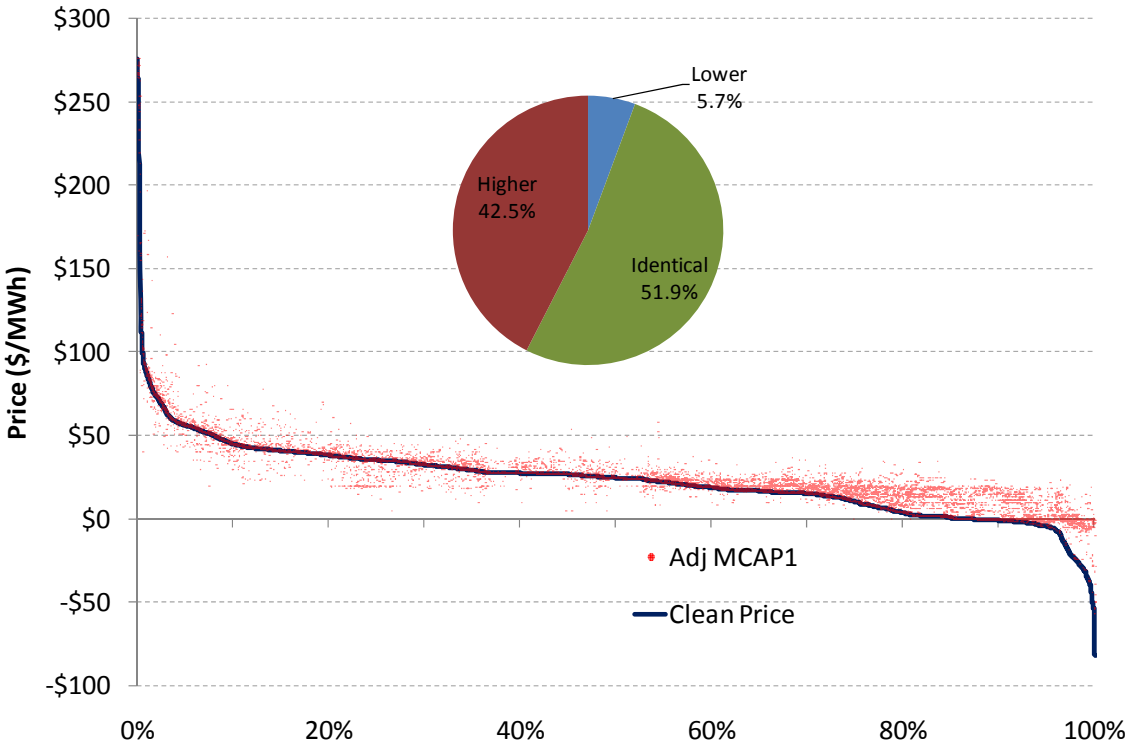
The inset pie chart indicates the proportions of intervals in which MCAP was lower than, identical to or higher than the Verve curve price. Over all trading intervals, MCAP was on average approximately $4.70 higher than the Verve curve price.

It is difficult to isolate impacts on MCAP that were specifically due to Relevant Quantity inconsistencies from those that were due to IPP offer tranches. During the year analysed, in approximately 20% of trading intervals, MCAP was set by the price of an IPP tranche in the market supply curve[8]. Assessing the full impact of IPP tranches setting MCAP would require every Relevant Quantity inconsistency to be removed in every trading period first. That would be a complex undertaking.

However, analysis indicates that addressing Relevant Quantity inconsistencies which are more easily accounted for has a reasonably significant impact on MCAP. For example, Figure 10 shows the effect of adjusting the Relevant Quantity to remove Resource Plans and Shortfalls where the participants concerned never submit STEM supply curves. This is relatively straightforward to detect. These Resource Plans relate to some small generators. The quantity inconsistency for this group varied by trading interval, being on average of the order of 14 MWh but at times exceeding 40 MWh.

[8] This excludes any intervals where STEM and MCAP prices were identical.

Figure 10: Removing Resource Plans/Shortfalls Where The Participants Never Submit to STEM

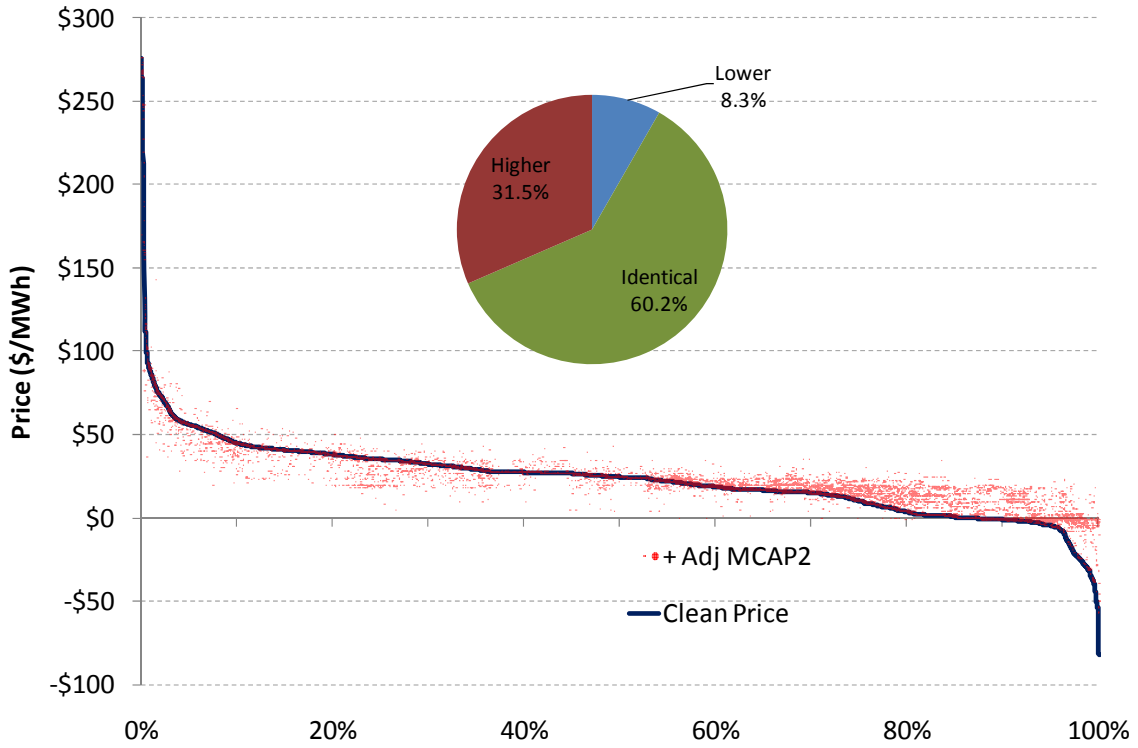


Points of note include:

- The adjusted MCAP is identical to the Verve curve price in approximately 52% of trading intervals (compared to around 41% of the trading intervals for actual MCAP).
- The average price difference approximately reduced by approximately $1.70 to around $3 above the Verve price (compared to actual MCAP being around $4.70 above the Verve price).

Figure 11 shows the impact of further adjusting the Relevant Quantity by removing Resource Plans and Shortfalls in trading intervals in which the relevant participant did not submit a STEM supply curve or all tranches in its STEM supply curve submissions were above the STEM clearing price in all trading intervals. These Resource Plans relate mostly to a number of small participants, the average quantity inconsistency for the group being of the order of 10 MWh and at times was as high as 110 MWh in some intervals.

Figure 11: Plus Removing Resource Plans/Shortfalls For Intervals When Participant Did not Submit to STEM



The chart shows cumulative impact of this and the previous adjustment. Points of note include:

- MCAP with this adjustment as well is identical to the Verve price in approximately 60% of trading intervals (an increase of around 8% over the previous adjustments).
- The average price difference reduced by a further $1.10 to around $1.90 (compared to around $4.70 for actual MCAP compared to the Verve price).

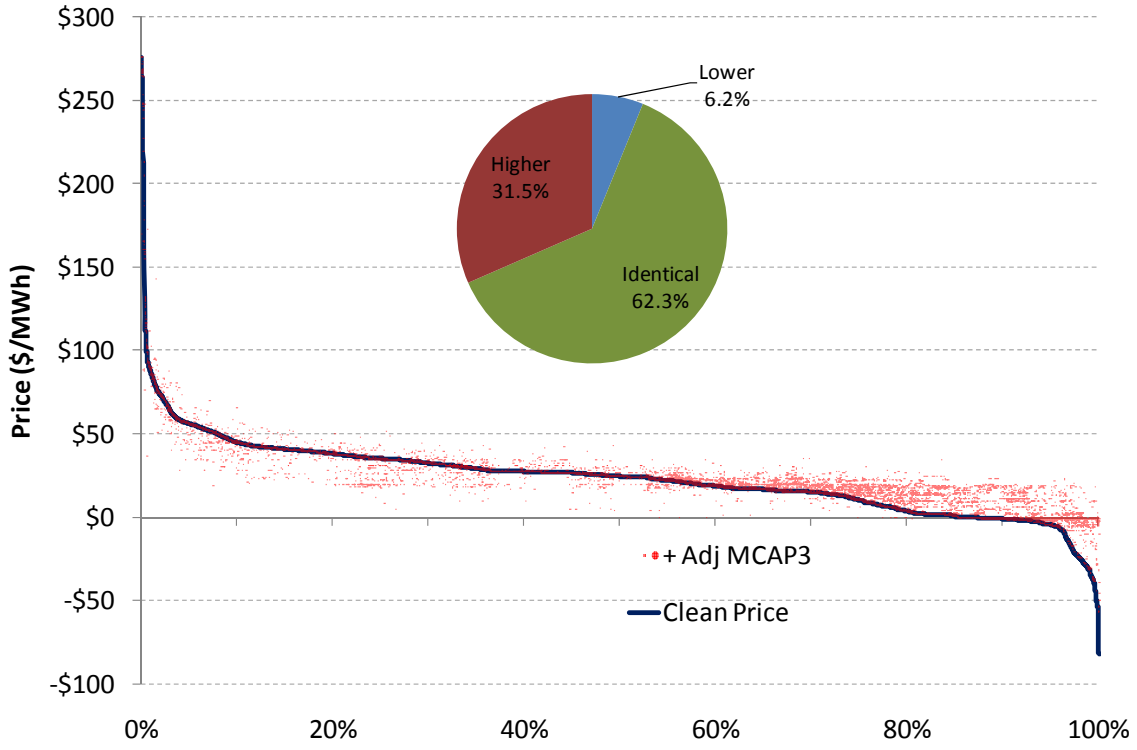
Figure 12 shows the impact on MCAP of further adjusting the Relevant Quantity[9] to account for inconsistencies between Resource Plans/ Shortfalls and STEM supply curve quantities priced below the STEM clearing price.

This effect relates to a small number of participants and tends to vary by participant and interval. The average quantity inconsistency for this group was of the order of negative 1 MWh. This appears small because the effect can be positive or negative, and ranged between

[9] i.e. the cumulative impact on MCAP including the previous effects.

approximately plus and minus 100MWh, although only affecting around 25% of the relevant intervals[10].

Figure 12: Plus Adjusting for Resource Plans/Shortfalls Inconsistent With STEM Submissions



Points of note include:

- MCAP with this adjustment as well is identical to the Verve price in approximately 62% of trading intervals (an increase of around 2% over the previous adjustments).
- The average price difference increased by around $0.20 to approximately $2.10 above the Verve curve price. Whereas adjusting for the previous effects generally caused MCAP to be lower, the impact of these changes can be in either direction. i.e. in some trading periods, participant Resource Plan/Shortfall was less than indicated in the STEM supply curve; in other periods it was greater.

This effect has not been assessed for trading intervals in which an IPP supply curve tranche was marginal in the STEM. Resolving uncertainty about supply curve quantities compared to Resource Plan/ Shortfall quantities would require more complex analysis of the trading

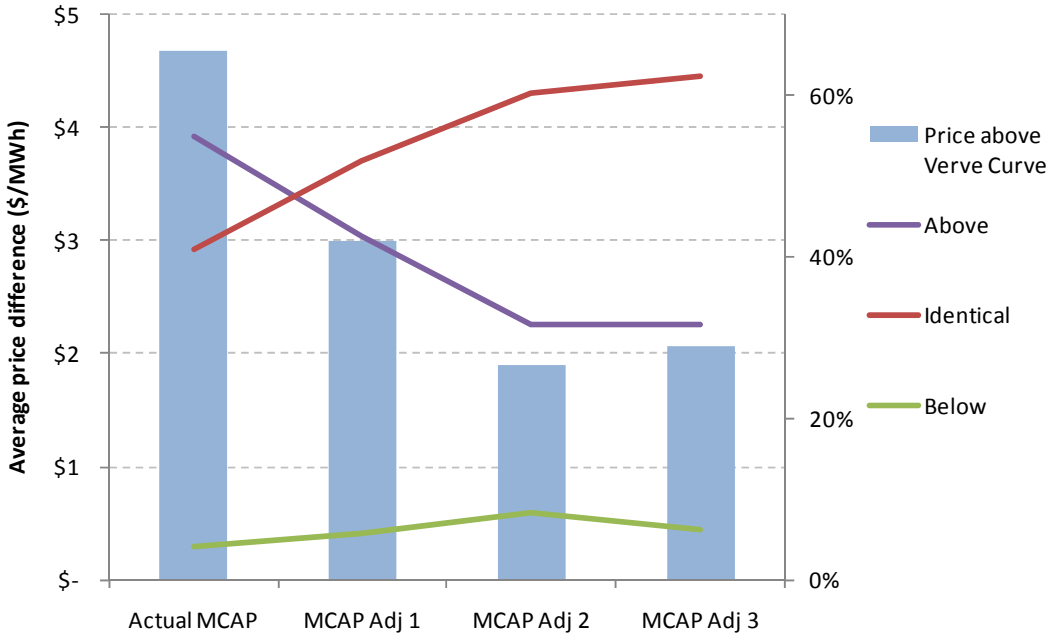
[10] i.e. only intervals where an IPP tranche did not set the STEM price were analysed (about 75% of all intervals)

intervals involved (of the order of 25% of intervals). However, inconsistencies were unlikely to have occurred in all such intervals and, if they had, would not necessarily have caused MCAP to be different. Without undertaking more exhaustive analysis, it is difficult to estimate residual Relevant Quantity impacts on MCAP in order to fully isolate the effect of IPP offer tranches on MCAP.

The results (in Figure 12) are consistent with the observation that over the period analysed Verve was tending to provide downwards balancing support. The likelihood of IPP tranches causing MCAP to have been higher than Verve's price curve was therefore higher. Had balancing energy requirements been systematically upwards, then the IPP offer tranche issue would have tended to cause MCAP to be lower than the Verve price. In practice, the underlying effect on MCAP was masked by the Relevant Quantity inconsistencies biasing MCAP upwards. Given the incidence of IPP tranches in the vicinity of the balanced market position, a significant portion of the residual price difference calculated above would have resulted from the IPP tranche effect[11]. Earlier analysis of the year ending March 2010 indicated that Relevant Quantity inconsistencies affected MCAP in more intervals, with the number of intervals in which actual MCAP was identical to the Verve price being around 47%, and rising to around 80% of intervals after the adjustments described above.

Figure 13 summarises results from the above analysis, indicating the cumulative effect of the adjustments described.

Figure 13: Summary of Analysis



11 Estimated demand curtailment would have affected MCAP in a small number of intervals but has not been specifically excluded. Nor has there been any attempt to account for any commissioning activities.

An implication of MCAP being above the Verve price, even with Relevant Quantity inconsistencies addressed, is that with Verve consistently balancing downwards overnight balancing prices would not have been cost reflective as evident from the right hand side of the adjusted MCAP curve in Figure 12.

MCAP distortions generally will flow through to and be compounded by DDAP and UPDAP payments.

7 Options

Relevant Quantity issues have had a significant impact on the balancing price. Accounting for some Relevant Quantity inconsistencies could be relatively straightforward. Accounting fully for all Relevant Quantity inconsistencies is more problematic though. Setting the balancing price based on Verve's supply curve and its loss adjusted generation would be relatively straightforward, and would address both sets of issues. Looking forward, so too would setting the balancing price at the price of the marginal balancing support offer or bid dispatched by SM. i.e. in line with the principles discussed in section 4.

Making any changes to the way in which balancing prices are calculated will require changes to pricing and settlement software. The changes required are also likely to differ depending on the results of efforts to achieve greater participation in balancing, currently under consideration. Subject to the outcome of discussion at this meeting regarding options for increasing participation in balancing, options available at this time include:

a) Ensuring that the following quantities are excluded from the Relevant Quantity calculation when MCAP is calculated:

   - Resource Plans and Resource Plan Shortfalls where the relevant participant never makes a STEM supply curve submission (IT requirements aside, that should be straightforward).

   - Resource Plans and Resource Plan Shortfalls in specific trading intervals in which the relevant participant has not made a STEM supply curve submission (straightforward in principle, IT requirements aside).

   - Resource Plans and Resource Plan Shortfalls where the relevant participant makes STEM supply curve submissions but never at a price below the STEM clearing price.

   - These fixes would not address all Relevant Quantity inconsistencies though, some which are more difficult to identify and fix.

b) Requiring participants in the above situations not to submit Resource Plans or Resource Plan Shortfalls. This would reduce information available to SM but the participants concerned could be required to indicate their intentions to SM separately. This would be straightforward for participants that never make STEM supply curve submissions but probably more problematic for those which do depending on circumstances.

c) Attempt to adjust all Relevant Quantity inconsistencies. That is likely to be a relatively complex undertaking.

d) Requiring all participants to make STEM supply curve submissions, and consider making it a requirement that Resource Plans/Shortfalls be consistent with the extent practical.

e) Setting MCAP based on the Verve supply curve and Verve loss adjusted quantity. This would be relatively straightforward to implement, subject to IT requirements, and would address both sets of issues.

Doing nothing does not seem plausible given the extent to which MCAP is being distorted and not cost reflective.

Options (a) and (b) would address significant Relevant Quantity inconsistencies, although (b) would minimise IT change requirements. These options though would only be partially consistent with the RDIWG's position that Relevant Quantity inconsistencies be addressed.

Option (c) would be consistent with the RDIWG position but would be relatively complex, requiring significant IT changes which may not be consistent with longer term directions/ requirements.

Option (d) would avoid that but may impose additional compliance costs on some participants and additional surveillance efforts.

Option (e) would address both sets of issues, and be relatively straightforward to implement. It would take some time to design and implement IT and rule change requirements but is appealing in terms of simplicity and cleanliness of design. These are characteristics which where practical should drive market design efforts going. As noted above, in an ideal world, the balancing price would simply be set at the price of the marginal balancer simplifying things considerably. In contrast, addressing Relevant Quantity inconsistencies through changes to market systems and rules would lock in complexity and uncertainty and, compounded by the IPP tranche issue, would be inconsistent with pricing principles in a competitive balancing environment.

It would therefore seem sensible to consider the options in light of the discussion at this meeting regarding options to increase participation in balancing support. Likewise, with regard to addressing concerns about DDAP/UDAP not being cost reflective.

Given that any option involving market design changes will take some time to develop and implement, there may merit in the meantime in requesting participants that do not make STEM supply curve submissions to not submit Resource Plans/Shortfalls and provide the information to SM separately.

8 Recommendations

The IMO recommends that the RDIWG:

1. **Note** that inconsistencies between Relevant Quantity components and STEM supply curve submissions have had a significant impact on the setting of MCAP;

2. **Note** that working through the remaining components affecting MCAP pricing seems likely to be quite difficult;

3. **Note** that cleaner options around either a clean pricing curve based on the pricing curve of whoever is providing the balancing OR new balancing pricing arrangements based on new balancing provision options seem likely to be more sensible and sustainable options to pursue;

4. **Agree/not agree** in the interim to request participants that do not make STEM supply curve submissions to not submit Resource Plan/Shortfalls and provide the information to SM separately.

imo
Independent Market Operator

Addressing Key Problems in the WEM

Market Evolution: Program Summary – draft for RDIWG consultation

Date: 29 October 2010

Contents

DOCUMENT DETAILS

Release Status: Draft
Confidentiality Status: Public

Independent Market Operator
Level 3, Governor Stirling Tower
197 St George's Terrace, Perth WA 6000
PO Box 7096, Cloisters Square, Perth WA 6850
T (08) 9254 4300
F (08) 9254 4399
E imo@imowa.com.au
W www.imowa.com.au

Revision History

Version	Date of Revision	Author	Description of Change	Affected Sections
1	12 October 2010	Douglas Birnie	Draft	All
2	21 October 2010	Douglas Birnie	Draft	All
3	29 October 2010	Douglas Birnie	Draft for consultation with RDIWG	All

Approvals

Name	Organisation	Title	Signature	Date

Executive Summary

The Wholesale Electricity Market ("the Market") has been in operation for four years and has achieved a significant reduction in Short Term Energy Market (STEM) and Balancing prices and increased private investment in generation capacity. However, the unprecedented economic growth in Western Australia followed by the global financial downturn have clearly impacted on the electricity sector and operation of the Market and resulted in some of the particular problems of the initial design becoming more transparent, faster than expected.

For example, private Market Participants currently do not face the true costs of balancing and have no real opportunity to participate in its provision, whereas the current State provider of balancing services (Verve Energy) is struggling to achieve a return on its investment. The result is poor incentives to invest in cost-effective balancing-type capacity. Yet there is an increasing need for a wider range of cost effective balancing options given the large daily variations in energy demand in the Market, the growth in intermittent generation particularly wind, and the State generator's rapidly falling energy market share. In short, the current "hybrid" Market is creating distorted prices and investment signals, imposing unnecessary costs and denying participation opportunities in some key aspects of the Market.

Last year in work on the Market Rules Evolution Plan, Market Participants assessed some of the problems affecting the Market and identified the following as needing the most immediate attention:

- *Balancing pricing and provision* – the lack of cost reflective prices and opportunities for all but one Market Participant to participate in the provision of balancing;
- *Timing of the STEM* – the lack of ability to use the latest information to prepare bids/submissions in the day-ahead Market and align this with gas nominations;
- *Reserve capacity refund system* – the static and rather blunt nature of the refund system that is not reflective of real time conditions/impacts; and
- *Ancillary Services provision* – the lack of opportunities for all but one Market Participant to participate in the provision of Ancillary Services.

Around the same time, the Government triggered a review of Verve Energy (the "Oates Review") that led to work on assessing the effectiveness of the current design of the Market. The IMO was requested to work with the Oates Implementation Team to assist with this analysis.

As a result of this work and concerns around the need for effective industry engagement, the Market Advisory Committee (MAC) in August of 2010, established the Rules Development and Implementation Working Group (RDIWG) involving representatives from across the industry to assess the problems in these areas and identify solutions. The MAC recommended that:

(i) initial development work should assume the retention of the current hybrid Market design, pushing evolving this design as far as practicable, prior to considering exploration of further Market design options;

(ii) the work should be based on an action plan drawn up by the MAC; and

(iii) the IMO will need to deliver robust reliable and stable IT solutions within the current market framework.

The IMO Board agreed with the proposed program but noted that should this work not identify sustainable solutions to these problems then it would ask for an assessment of more fundamental Market re-design options.

To compound these challenges, the IT and related systems operated by the Independent Market Operator (IMO) to support the Market are also a significant constraint. The desire to hold down the initial costs of the implementation of the Market unfortunately lead to the development of IT systems with a multitude of different software applications based on outdated code that are difficult to modify. Hence the IMO Board early in 2009 had to approve a four-year program of IT initiatives to "smarten" these systems so as to allow them to be more adaptable to incremental changes in the Market.

Given this, the IMO has set up a program called the Market Evolution Program (MEP) to:

i. support the workings of the RDIWG;

ii. align the rolling out of the IT "roadmap" system changes with the RDIWG's priorities; and

iii. manage the development of rules and system changes as they become clear.

The MEP has a provisional budget of $7.98 million for the period up until 30 June 2012, assuming the work is based on the current hybrid design, plus a provisional $1.01 million for an assessment of more fundamental re-design options. The latter will only be used should this be recommended by the MAC and/or required by the IMO Board.

Over 50% of these monies is provisionally forecast to be used for IT related spending on upgrading the current systems. The remaining monies are for program management and support and expert consultancy assistance given the lack of internal capacity within IMO to manage a program of this size and complexity.

All consultants working on the program have had experience working in other wholesale electricity markets, are directly accountable to relevant IMO managers, and are on fixed monthly expenditure caps that can only be varied by separate agreement.

Some of the MEP work will, however, bring forward/replace investment (worth $1.6 million) planned in the market-supporting IT systems that already had approved financing over 2010-2013. Consequently, the IMO will need up to $7.5 million (as opposed to $9.1 million) in extra capital to support the entire program.

This investment should be sufficient to fund changes consistent with the current hybrid design raised by Market Participants. Specifically, Market Participants should see a more efficient and competitive Market arising from:

- more cost reflective balancing pricing and opportunities to provide balancing;
- a greater ability to use more accurate information in the operation of the STEM;
- a more "real time" targeted reserve capacity refund system;
- more opportunities to provide Ancillary Services; and
- a more 'fit for purpose' IT system supporting the current hybrid Market.

However, the IMO will only draw down the actual monies required to fund the necessary work. If relatively simple solutions emerge (particularly around balancing) then the costs would be less than these estimates. The actual amounts will be capitalised and recovered from Market Fees over subsequent years.

The biggest risk to the MEP revolves around decision-making. The longer it takes to get agreement on the changes desired, the greater the time that will be required to implement them and the greater the overall cost. The current MEP and budget has been based on assumptions around key decisions emerging from the RDIWG from December 2010 to February 2011. Specifically:

- if agreement can be reached on later timing for the STEM bidding process, the submission of gross nominations, and new, more dynamic reserve capacity arrangements by the end of this year, then these new arrangements could be operating by October 2011; and
- if agreement can be reached on new, relatively simple balancing pricing and provision arrangements by January/February 2011, then the new balancing system arrangements could be operating in December 2011, given the need for more significant Market Rule and IT changes. Any move to a more complex balancing arrangement would take longer than this.

The MEP is currently proceeding on this basis. If these assumptions change significantly in an adverse manner and/or the decision is made to re-design the Market in a more fundamental manner, then significant further funding will be required along with a revision of the MEP.

Market Participants will be involved in the entire program and communications around the MEP will be critical. Regular briefings will be provided and updated information will be available on the IMO website.

1. Background

Following assessment of a number of problems apparent with the current market design the IMO developed a work plan on potential areas to address and sought feedback on the priorities from Market Participants. The result was the IMO's Market Rules Evolution Plan that outlined five priority areas for work over the next three years. These areas comprise reviews of:

- the current Balancing Mechanism;
- certain aspects of the Reserve Capacity Mechanism;
- potential areas of improvement in the operation of the STEM aimed at increasing trade volumes, price relevance and STEM predictability;
- the window between electricity positions and gas nominations; and
- the procurement of Ancillary Services.

The Verve Energy Review also identified the need for the review of key parts of the Market design. It recommended a series of changes to the Market to enable it to better support reliability. These include increasing the certainty of attracting new capacity, increasing the reliability signals in the market itself, drawing all generators into providing balancing services and where applicable Ancillary Services.

As a consequence, the Verve Review Implementation Oversight Group was established to undertake a review of the current market design. The IMO was asked to assist with the Government-led exercise. In March 2010 a draft concept paper was presented to the MAC outlining four options to improve the coordination of resources within day-ahead timeframes:

- *Option A1: Enhanced Hybrid*

  Retain Verve Energy as default / primary balancer; opportunity for wider participation through balancing support contracts (BSC) supported by appropriate incentives (including pricing and cost allocation).

- *Option A2: Enhanced Hybrid + Re-nomination*

  As for option A1 plus the ability to re-declare contract position and adjust resource plan accordingly.

- *Option B: Net Dispatch*

  Net dispatch for Independent Power Producers and Verve Energy with both eligible to provide balancing support through increment/decrement offers (or possibly BSCs).

- *Option C: Gross Dispatch*

  IPPs and Verve Energy compete to provide balancing support (on same terms) through offers for gross dispatch.

Background papers on all these issues can be found at www.imowa.com.au/design_review.

After some discussion over several meetings, the MAC agreed in August 2010 that:

- initial development work should assume the retention of the current hybrid Market design, pushing evolving this design as far as practicable, prior to considering exploration of further market design options;
- at the 11 August 2010 MAC meeting it would determine and prioritise an action plan drawn from the issues identified during the market design review project, the Verve Energy Review, the Market Rules Evolution Plan and raised by the MAC; and
- the IMO will need to deliver robust reliable and stable IT solutions within the current Market system framework.

The MAC set up the RDIWG to recommend changes and oversee their implementation.

The IMO has set up a program team to service the RDIWG and ensure the timely and cost effective implementation of Market Rule and related changes that will ultimately arise from its work. The IMO has also set about improving the IT systems which support the operation of the Market to deal with some of the current significant constraints and enable it to roll out changes in the design of the Market.

2. RDIWG, Program Governance, Roles and Responsibilities

The Minister for Energy and the IMO Board are the ultimate decision makers for changes in the design of the Market and related Market Rules. But they are advised by the MAC, representing experts across industry. For this program, the MAC has set up the RDIWG to assess the current design issues and identify solutions. The RDIWG has been meeting since late August 2010.

The members of the RDIWG include:

Allan Dawson	Chair
John Rhodes	Market Customer (Synergy)
Corey Dykstra	Market Customer
Steve Gould	Market Customer
Patrick Peake	Market Customer
Andrew Everett	Market Generator (Verve Energy)
Shane Cremin	Market Generator
Andrew Sutherland	Market Generator
Phil Kelloway	System Management
Chris Brown	Economic Regulation Authority
Paul Hynch	Office of Energy

The terms of reference for the RDIWG and all its papers can be found at www.imowa.com.au/RDIWG.

The IMO has set up a program with several work streams to support the RDIWG and roll out related IT/operational changes. Key IMO contacts and roles for the program are as follows:

Program Sponsor	Allan Dawson
Program Steering Group	IMO Senior Management Team plus advisors
Program Manager	Douglas Birnie
Market Design	Troy Forward
Market Rules	Jacinda Papps
Business Requirements	Matt Pember
Market Operations	Will Street
Market Systems	Tim De Boer
Communications	Justine Oxley
Finance	Murray Cribb/Malcolm Burnaby

There are, in effect, three components to the program:

(i) supporting the confirmation of new market arrangements at a high-level design level;

(ii) updating the IMO's systems so it can more readily adapt to future change; and then

(iii) implementing the newly agreed market arrangements via Market Rules, operational and system changes.

3. Problem Definition

The Market has been in operation for four years and has achieved a significant reduction in wholesale electricity prices (i.e short term electricity market prices) and increased private investment in generation capacity. However, the unprecedented economic growth in Western Australia followed by the global financial downturn have clearly impacted on the electricity sector and operation of the Market and resulted in some of the particular problems of the hybrid design becoming more transparent, faster than expected.

For example, private Market Participants do not currently face the true costs of balancing and have no real opportunity to participate in its provision, whereas the current provider of balancing services is struggling to achieve a return on its investment. The result is poor incentives to invest in cost-effective balancing-type capacity. Yet there is a clear need for a wider range of cost effective balancing options given the large daily variations in energy demand and the State generator's rapidly falling energy market share. In short, the current "hybrid" market is creating distorted prices and investment signals, imposing unnecessary costs and denying participation opportunities in some key aspects of the Market.

Last year under the Market Rules Evolution Plan, Market Participants assessed some of the problems affecting the Market and identified the following as needing the most immediate attention:

- *Balancing pricing and provision* – the lack of cost reflective prices and opportunities for all but one Market Participant to participate in the provision of balancing;
- *Timing of the STEM* – the lack of ability to use the latest information to prepare bids/submissions in the day-ahead Market and align this with gas nominations;
- *Reserve capacity refund system* – the static and rather blunt nature of the refund system is not reflective of real time conditions/impacts; and
- *Ancillary Services provision* – the lack of opportunities for all but one Market Participant to participate in the provision of Ancillary Services.

The IT and related systems operated by the IMO to support the Market are also a significant constraint. The desire to hold down the costs of the implementation of the Market unfortunately lead to the development of IT systems with a multitude of different software applications based on outdated code that are difficult to modify. Hence in 2009, the IMO Board had to approve a series of IT initiatives lasting over four years to "smarten" these systems so as to allow them to be more adaptable to incremental changes in the Market.

3.1 Detailed issues

In light of the MAC recommendations, the RDIWG has agreed to seek solutions to ten specific problems as follows:

1. There is very limited opportunity for participants other than Verve Energy to participate in providing balancing service and this inevitably means the cost of balancing is higher than it needs to be.
2. Provision for Balancing Support Contracts has not been effective to date.
3. The calculation of MCAP and the role of UDAP and DDAP mean that balancing prices are not cost reflective and this leads to ineffective incentives for decisions about provision and participation and inequitable financial transfers between Market Participants that compromise the integrity of the Market.
4. At different times the capacity refund arrangements under and over price the value of capacity leading to inefficient decisions by Market Participants about the timing, maintenance and presentation of capacity.
5. The timing of operation and single pass design of STEM may be limiting the ability of the Market to achieve efficient operation and cost reflective prices and accordingly creates a barrier for participation by all parties.
6. The requirement for resource plans to match STEM outcomes may be limiting participation in STEM and/or forcing inefficient dispatch of IPPs and Verve Energy (as balancer), as IPPs attempt to comply with resultant resource plans.
7. Poorly aligned gas and electricity mechanisms inhibit flexibility to respond to changing circumstances and produces suboptimal outcomes in the WEM.

8. Lack of transparency inhibits the ability of Market Participants to optimize interaction in the daily Market.
9. Provision of net bilateral submissions compromises transparency and the accuracy of future price forecasts and may lead to sub-optimal decisions about participation by other Market Participants.
10. Pay as bid pricing for dispatch of IPP plant for balancing (outside a balancing support contract) is incompatible with efficient wider participation in balancing and potentially over compensates IPPs, which bid at price caps due to uncertainty of dispatch outcomes.

It has also noted that there is very limited opportunity for Market Participants other than Verve Energy to participate in providing Ancillary Services. This is due to the lack of certainty surrounding the pricing mechanism and the requirement to provide the service at a discount to Verve Energy. System Management will look to develop a day-ahead procurement mechanism and present the outcomes of its analysis at the RDIWG.

Separate, but related to this, is the state of the key IT systems operated by the IMO that support the Market. The systems put in place at the commencement of the Market used a multitude of software applications with outdated language. The IT systems were not suited to implementing change and supporting further development, as could be expected with an evolving market.

In summary, the problems that led to the inception of this program are:

- The lack of truly cost reflective prices in the Market;
- The lack of opportunity for all Market Participants to participate in all parts of the Market given the reliance on one incumbent for balancing and Ancillary Services;
- The inability to use the best information in the operation of the STEM;
- Issues arising from the reserve capacity refund system;
- Constraints posed by the current IT systems supporting the Market.

4. What will success look like?

Ultimately the MEP's goal is to achieve a more efficient Market than would otherwise be achieved, in a manner consistent with the Market Objectives. Consumers should ultimately benefit from a reliable electricity system that is more cost efficient.

Potential outputs that should arise from the MEP include:

1. More cost reflective pricing;
2. Greater opportunities for all Market Participants to participate, including Balancing and Ancillary Services;

3. The greater ability to use more accurate information in market bidding/submissions;
4. The reserve capacity refund system achieving more efficient outcomes;
5. The rolling out of a more adaptable and flexible "IT base" upon which future changes to the market design can be accommodated and then implementing these changes – all on time and on budget.

The exact nature of these outputs will only be determined as the program progresses and will likely depend on which combination of specific measures achieves the best outcomes from an economic efficiency point of view.

The following seem appropriate measures for assessing the impact of the program over time:

1) STEM and balancing prices;
2) Balancing volumes and numbers providing balancing services;
3) The costs of reserve capacity refunds and actual forced outage data; and
4) Ancillary service prices and number of organisations providing Ancillary Services.

The IMO will continue to measure and report on these to assess before during and after the program.

5. Assessment Criteria

The MEP must seek and implement solutions that are consistent with the Wholesale Market Objectives set out in the Market Rules. These are:

a) to promote the economically efficient, safe and reliable production and supply of electricity and electricity related services in the South West interconnected system;

b) to encourage competition among generators and retailers in the South West interconnected system, including by facilitating efficient entry of new competitors;

c) to avoid discrimination in that Market against particular energy options and technologies, including sustainable energy options and technologies such as those that make use of renewable resources or that reduce overall greenhouse gas emissions;

d) to minimise the long-term cost of electricity supplied to customers from the South West interconnected system; and

e) to encourage the taking of measures to manage the amount of electricity used and when it is used.

6. Budget and Financial Management

The MEP has a provisional budget of $7.98 million for the period up until 30 June 2012 assuming the work from above can be based on the current hybrid design plus a provisional $1.01 million for an assessment of more fundamental re-design options, should this be required.

Over 50% of these monies are for IT-related spending on upgrading its current systems. The remaining monies are for program management and support and expert consultancy assistance given the lack of internal capacity within IMO to manage a program of this size and complexity. All consultants working on the program have had experience working in other wholesale electricity markets, are directly accountable to relevant IMO managers and are on fixed monthly expenditure caps that can only be varied by separate agreement.

Some of the MEP work will, however, bring forward/replace investment worth $1.62 million planned in the IMO's IT systems that already had approved financing over 2010-2013. Consequently, the IMO will be seeking the right to draw down up to $7.38 million (as opposed to $9.0 million) in extra capital to support the entire program should this be required. The actual amounts will be capitalised and recovered from Market Fees over subsequent years. The capital impacts of the MEP are demonstrated in the following table:

	Currently approved capital budget for IMO	MEP budget (under current hybrid design)	MEP additional budget (for B-C evaluation)	Work to be done under the MEP previously covered by current capital spend	IMO new total capital budget	*Change from current approved capital budget*
	$m	$m	$m	$m	$m	$m
2010/11	1.785	4.628	0.000	-0.491	5.922	*4.137*
2011/12	1.620	3.355	1.007	-0.589	5.393	*3.773*
2012/13	1.645	0.000	0.000	-0.540	1.105	*-0.540*
	5.050	**7.983**	**1.007**	**-1.620**	**12.420**	***7.370***

Key cost components of this budget include:

- the dedication of resource i.e. separate office facilities, external program manager and program support and communications;
- the utilisation of external expertise in the market concept design;
- legal drafting and external expertise for Market Rules development; and
- the utilisation of external expertise plus some new hardware for systems design.

For 2010/11, $0.67 million was set aside to fund preparatory costs for the MEP. This funding covered preparatory work on the MEP. Approval will be sought from the Minister for Energy and the Department of Treasury and Finance to fund the remaining costs for the program this financial year from reserves (under the *Electricity Industry (Independent Market Operator) Regulations 2004*) and then approval for the capital spend required as part of the Strategic Asset Plan in November 2010 and any additional operational expenditure in the Operation Plan for 2011/12 in April 2011. The funding sought for the current program does not meet the thresholds required for a Declared Market Project, hence Economic Regulatory Authority approval is not required.

The budget will be broken down by into five effective "cost centres":

(i) program management;

(ii) market concepts and Market Rules;

(iii) market operations;

(iv) business requirements and testing; and

(v) market systems and managed within these centres unless variations require more fundamental review.

The budget assumes decisions are made in a timely manner by the RDIWG. If this does not eventuate or decisions are changed subsequently then this will have a significant impact. Some expenditure committed might have to be written off and more funding required. Moving to a real time STEM and/or moving to a net or gross dispatch model for operating the STEM and balancing are also not included in the current budget and would require additional funding if a decision was made to proceed with these.

However, the IMO will only draw down the actual monies required to fund the necessary work. If work remains focussed on the current hybrid design and relatively simple solutions emerge (particularly around balancing) then the costs would be less than these estimates. Similarly, the $1.01 "assessment of more significant options" budget is to be treated separately and will only be drawn down if that specific work is triggered.

7. Components, Key Risks and Timelines

As signalled earlier, there are, in effect, three components to the program:

(i) supporting the confirmation of new Market arrangements at a high level design level;

(ii) updating the IMO's systems so it can more readily adapt to future change; and then

(iii) implementing the newly agreed Market arrangements via Market Rules, operational and system changes.

The first component is the most significant – all others are dependent upon it – and yet it is not clear how long it is going to take. The longer it takes to get agreement on the changes desired, the greater the time that will be required to implement them and the greater the overall cost. Work, however, does

need to take place on (iii) simultaneously – so that the systems in place are better able to cope with and provide the functionality required from changes arising from (i).

The table summarises the essence of the current Program planning timeframes:

Design area	*Oct- Dec 2010*	*Jan-June 2011*	*June-Dec 2011*	*Jan-June 2012*
Balancing pricing and provision				
Concept work	Refining options underway	Sign off of options in Jan/Feb		
Rules development		Commences in March	Rules consultation and drafting	Rules finalised December
Operations and IT work	Baseline IT work underway	New IT system design would commence in March	New IT system designed and developed and tested	December start date
Later timing of STEM bidding and a move to gross nominations				
Concept work	Option refined and signed off November/December			
Rules development	Commences in December	Rules consultation and drafting	Rules finalised August	
Operations and IT work	Baseline IT work underway	IT and op system revisions designed and tested	October start date	
Reserve capacity refund revisions				
Concept work	Option refined and signed off December			
Rules development	Commences in January	Rules consultation and drafting	Rules finalised August	
Operations and IT work	Baseline IT work underway	IT and op system revisions designed and tested	October start date	

In summary:

- if agreement can be reached on later timing for the STEM bidding process, a move to gross nominations, and new more dynamic reserve capacity arrangements by the end of 2010, then these new arrangements could be operating by October 2011; and

- if agreement can be reached on new, relatively simple balancing pricing and provision arrangements by January/February 2011, then the new balancing system arrangements could be operating in December 2011, given the need for more significant Market Rule and IT changes. Any move to a more complex balancing arrangement would take longer than this.

RDIWG Action Points

Legend:

Shaded	Shaded action points are actions that have been completed since the last RDIWG meeting.
Unshaded	Unshaded action points are still being progressed.
Missing	Action items missing in sequence have been completed from previous meetings and subsequently removed from log.

#	Action	Responsibility	Meeting arising	Status/Progress
3	System Management to prepare a stylised day for the RDIWG to workshop overnight balancing options, unit commitment and de-commitment, timing and price etc.	SM	1	Completed. Presented at 11 October 2010 RDIWG meeting.
8	The IMO to investigate options for provision of BOM forecasts (including wind forecasts) prior to 12:15 pm.	IMO	2	Underway
9	The IMO to investigate options to vary gas nomination deadlines with the DBP operator.	IMO	2	Completed – meeting with DBP held 8 October 2010.
11	The IMO to discuss with System Management its requirements for actual wind speed data and progress a Rule Change Proposal to ensure the provision of this data (if appropriate).	IMO/SM	2	
13	The IMO to investigate whether there are any impediments to calculating a forecast MCAP (closer to real time).	IMO	2	Underway

#	Action	Responsibility	Meeting arising	Status/Progress
15	The IMO to investigate the impact on efficient operational practices of the weightings applied to Reserve Capacity refunds and the issue of large refunds being incurred for small downwards deviations, and prepare a discussion paper for presentation to the Working Group.	IMO	2	Underway. Initial presentation made to RDIWG at 11 October 2010 meeting.
17	The IMO to undertake analysis to assess the extent to which load forecasts are improved by using the 12.15 pm BOM forecast instead of the 7.00 am BOM forecast.	IMO	3	Underway
18	System Management to confirm the time that it receives its daily wind forecast.	System Mgmt	3	Completed. System Management confirmed forecasts received at 2.00 am and 2.00 pm each day.
19	The IMO to investigate with System Management whether wind generation forecasts could be provided to participants at the same time as load forecasts.	IMO	3	
20	The IMO to assess the impact of bringing forward the opening of the STEM and Resource Plan submission windows.	IMO	3	Completed
21	The IMO to discuss nomination timelines with the Goldfields and Parmelia gas pipeline operators and investigate options to vary these timelines.	IMO	3	
22	The IMO to discuss nomination timelines with the major gas suppliers to gain an overview of the current arrangements and investigate options to vary the nomination timelines.	IMO	3	
23	Working group members representing gentailers to consider the impact of providing gross bilateral submissions and provide their feedback to the IMO.	Gentailer representatives	3	Underway
24	The IMO to investigate the impacts of gentailers providing gross bilateral submissions, including the possibility of automatically generating Resource Plans for Market Participants with a single Facility.	IMO	3	Underway
25	The IMO to undertake further analysis to assess the extent to which MCAP and clean price differences are due to inclusion of IPP offers in the MCAP price curve versus potential inconsistencies between the calculation of the Relevant Quantity and quantities in STEM offers, and report back to the RDIWG with its findings.	IMO	3	Underway. Discussion paper to be distributed for the 2 November 2010 meeting.

#	Action	Responsibility	Meeting arising	Status/Progress
27	The IMO to amend the minutes of Meeting No. 3 to reflect the points raised by the RDIWG and publish on the website as final.	IMO	4	Completed.
28	The IMO to develop skeletal options to support increased participation in balancing, for presentation to the RDIWG at the 2 November 2010 meeting.	IMO	4	
29	RDIWG members to email the IMO details of their suggested options to support increased participation in balancing.	All	4	
30	The IMO to investigate with Verve Energy its ability to provide Facility based submissions and Facility based increment and decrement bids (relative to Net Contract Position) for balancing.	IMO	4	
31	The IMO to investigate options for a more dynamic Capacity Cost Refund mechanism and present its findings to the RDIWG.	IMO	4	
32	The IMO to investigate the original rationale behind the current weightings used for Capacity Cost Refunds, and present its findings to the RDIWG.	IMO	4	
33	The IMO to investigate options for the application of Capacity Cost Refund payments and present its findings to the RDIWG.	IMO	4	