New Balancing Market proposal – design details

1. INTRODUCTION

This document describes the key design features proposed for revised arrangements for short term operation of the Wholesale Electricity Market (WEM) in a manner that retains the core hybrid framework of the current design. This is where IPPs develop Resource Plans for their own facilities and System Management develops dispatch plans for the Verve Energy (Verve) portfolio. The design expands on the high level concept previously presented to the RDIWG at its 14 December 2010 meeting.

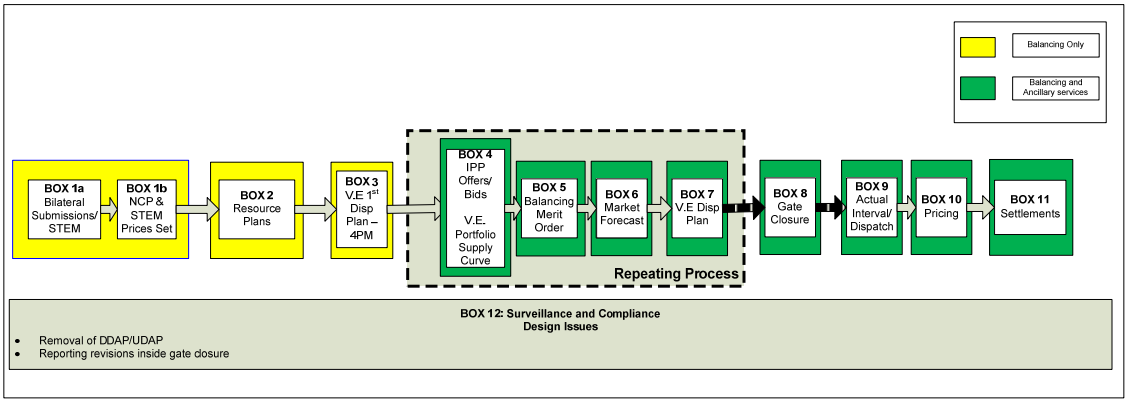
Sections 1 and 2 provide a high level overview (see figure 1). Section 3 provides additional detail of the proposed design in 12 stages.

Appendices A and B provides:

- A more detailed overview showing the roles and responsibilities for each process; and
- an example of the ability of the Balancing design to enable an IPP to de-commit a Facility if appropriate pricing conditions occur.

Finally, appendix C presents a glossary, which outlines the new defined terms that are being proposed in this design paper.

Figure 1: 12 stages of WEM operation



2. DESIGN SUMMARY

- The proposal is designed as an enhancement of the current hybrid design where IPPs are dispatched on the basis of Resource Plans and Balancing submissions (offers up/ bids down) around that level and Verve's portfolio dispatched by System Management on the basis of gross supply offers. The design also allows Verve to submit offers/bids for selected facilities.

- The design will allow for IPPs to participate in Balancing and provide for competitive provision of Ancillary Services.

- Verve will remain the default balancer and default Ancillary Service provider. System Management will continue to provide a dispatch coordination service to Verve and determine the dispatch of Verve's facilities on a portfolio basis in accordance with dispatch guidelines. As system and market conditions change (for example with weather, availability of fuel, capability of unscheduled wind generation) System Management will amend the Verve portfolio dispatch plan (as it does now), including commitment of units to optimise use of those resources whereas IPPs will renominate Balancing bids and offers. Verve will be able to restate its ~~portfolio supply curve~~Portfolio Supply Curve following major changes.

- The initial stages of operation of the market are little changed from the status quo (see the sections on bilateral and STEM submissions and operation of STEM – box 1a and 1b from Figure 1).

- Resource P~~p~~lans will be submitted by IPPs (and for any facilities Verve chooses to manage on a Facility basis). Resource P~~p~~lans will be broadly required to match Net Contract Position (NCP) and self-supplied l~~L~~oad (as now) except when the amount of energy (MWh) required by the NCP changes from one interval to the next. In these cases Market Participants will be entitled to elect to include Balancing energy on a planned basis around their Facility MW ramping rates.

- The first significant change to the design will be the introduction of submission of bids/offers for Balancing and Ancillary Service from IPPs and Verve. These submissions will follow the submission of Resource Plans and calculation of the first dispatch plan for Verve plant. IPPs will make these submissions on a Facility basis and Verve on a portfolio basis. The submissions will be for the full or gross potential Balancing range being offered and Ancillary Service capability and note where these might be mutually exclusive (or conditional) (see box 4).

- The market rules will describe the principles for deciding which Balancing offers/ bids and Ancillary Service offers will be selected for service from the conditional gross capabilities submitted (see box 5).

- The Balancing Merit Order (BMO) will be determined from the Balancing submissions taking account of accepted Ancillary Service offers (see box 5).

- IPPs and Verve will have specified rights to update Balancing and Ancillary Services submissions within nominated gate closure times (see box 8).

- System Management will continue to determine the timing of commitment and decommitment of Verve plant (other than facilities Verve has elected to manage outside its portfolio). In the first instance IPPs will manage commitment and decommitment of their facilities, as currently occurs (as expressed in Facility Resource Plans). However the design of the rules around resubmissions and gate closure will facilitate IPP participation in Balancing including decommitment when appropriate (see box 7).

- Non scheduled resources (e.g. wind) may submit an offloading price and will be incorporated in the Balancing Merit Order used by System Management at the time of dispatch.

- System Management will dispatch all plant to meet demand and ensure secure operating conditions are maintained in accordance with the final merit order. The ~~Real Time~~Final Balancing Merit Order (~~RTBMO~~Final BMO) is developed by updating the BMO and accounting for operational limitations advised to System Management (see box 9).

- The Balancing price will be determined ex post from the total generation requirements used and the ~~RTBMO~~Final BMO used for dispatch – no Upward Deviation Administrative Price (UDAP) or Downward Deviation Administrative Price (DDAP) factors will apply. Constrained on/off payments will be made for Facility offers/bids dispatched at prices inconsistent with their submissions (see box 10).

- System Management will retain wide authority to manage security of operation (see box 9).

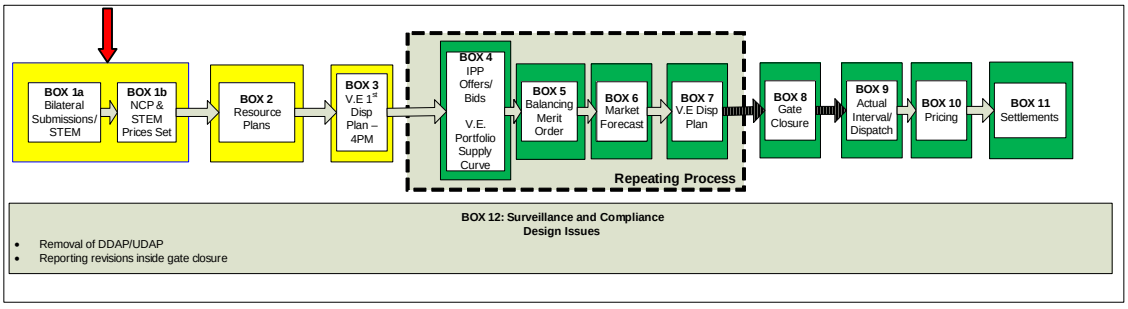
3. DETAILED DESIGN

The following pages describe each of the 12 stages in more detail. This current version of the paper provides only dot point summary of design details and later versions will be expanded with greater detail including rationale for design decisions.

3.1 BILATERAL SUBMISSIONS/STEM AND NCP AND STEM PRICES (Box 1)

3.1.1 Purpose:

This section describes the potential impacts on the current STEM process of implementing the new competitive Balancing market.



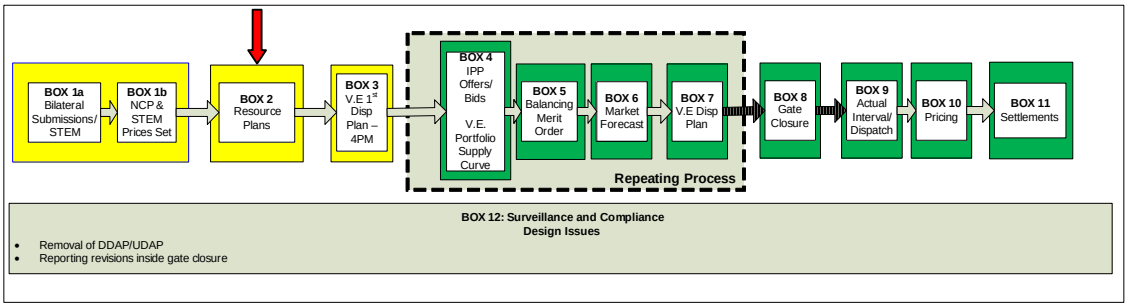
3.1.2 Proposal:

No Changes to Current STEM process and setting of NCP.

3.2 RESOURCE PLANS (Box 2)

3.2.1 Purpose:

This section explains the role of Resource Plans (RPs).



3.2.2 Background:

Once accepted RPs can be seen as self issued Dispatch Instructions (DIs) that self scheduled facilities need to comply with in order to meet their NCPs and any self supplied load. Proposed RPs must be reviewed and accepted as technically viable by System Management from a system security perspective.

Currently, RPs state the energy (MWh) proposed to be generated in a Facility in each interval and this energy must match the total NCP and self-supplied load of the relevant Market Participant.

No change to this general principle is proposed, however, the format of the submissions and the stringent requirement for energy within RPs to match NCP when NCP changes, is to be amended.

3.2.3 Proposal:

- ~~Resource plans~~RPs will be required for all IPP scheduled facilities (no change) and any facilities Verve elects to operate on a Facility basis. The sum of RPs submitted by a participant must match the participant's NCP plus self-supplied load except where this quantity is changing from one interval to the next.~~:~~

- For each dispatch interval, RPs are to specify a MW target (sent out) with a specified ramp rate from a specified time:

    - This will make the format of the implied self DIs~~dispatch instructions~~ through RPs consistent with the form of System Management DIs~~dispatch instructions~~ for Balancing in any interval (subject to development of necessary dispatch support tools).

    - Facilities operating to a RP will thus ramp up or down linearly in an interval and will be operating at a nominated level by the end of the interval.

    - The linear ramp rates must be realistic estimates of how the participant will dispatch the facility to meet the target level specified, accepting that for practical reasons a facility may not be able to ramp continuously at a uniform rate. However, the specified ramp rate should reflect the time the participant expects to take, from the start of the interval, to ramp to the specified target MW level.

- The RP will form the reference level for Balancing offers/bids.

- ~~System Management will accept/reject RPs in response to system security concerns caused by RPs.~~

    - ~~The Market Rules and Market Procedures/ Power System Operation Procedures will specify under what circumstances and what actions System Management will use this judgement.~~

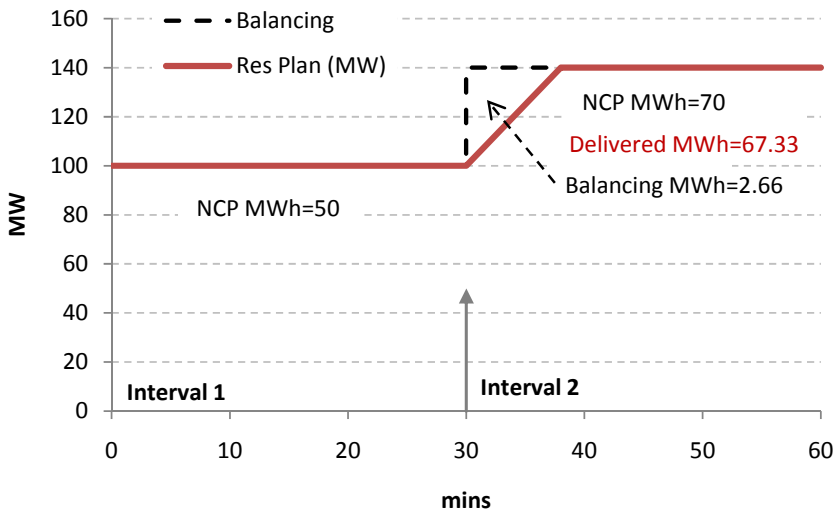
- RPs in each interval from each Market Participant must match the energy (MWh) in the corresponding NCP except when the NCP changes from one interval to the next.

    - When NCP changes from one interval to the next a RP may indicate more or less energy than the relevant NCP, this may result in one of two scenarios:

        1. The total energy provided by the facility is less than NCP (if NCP is increases as illustrated below), or more energy is produced when NCP decreases, this scenario exposes a participant to balancing energy; or

        2. when NCP is increasing (or decreasing) a participant may chose to "overshoot" (or undershoot) the NCP implied MW value, in this scenario a participant will choose a MW target that is above the NCP implied MW value so that the energy produced is equal to the MWhs in the NCP

    - The RP indicates ramping at 5 MW per minute at the start of interval 2 to a target of 140 MW, equivalent to the MW level implied by the 70 MWh NCP.



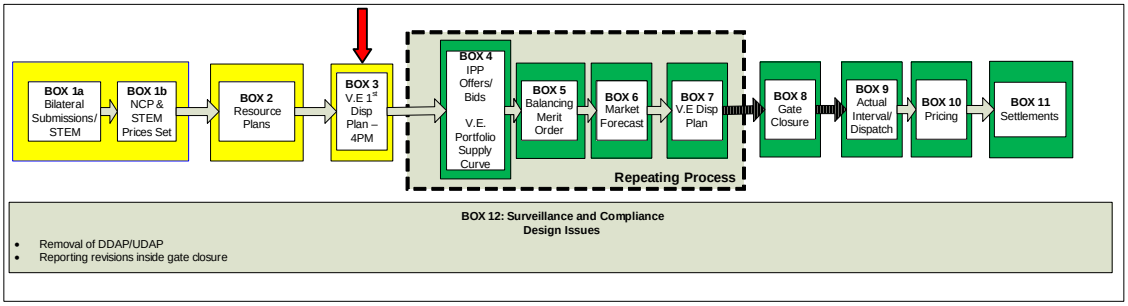
Note: RPs will contain sufficient information for half hour market processes and will not need to account for the level of Balancing or Ancillary Services that may be accepted by System

Management. Bids and offers for Balancing and Ancillary Services will be submitted relative to the RPs. Renominations and operational protocols will provide for System Management to receive all information needed for secure operation of the power system through the ~~Real Time Balancing Merit Order~~Final Balancing Merit Order (~~RTBMO~~Final BMO) and within half hour operational details e.g. short term interactions between Resource Plan ramping and Balancing capability (for additional information see Box 9).

3.3 VERVE ENERGY 1ST DISPATCH PLAN (Box 3)

3.3.1 Purpose:

This section explains the role of the first System Management created Verve Energy Dispatch Plan in the context of the implementation of the competitive Balancing market.



The Verve Energy Dispatch Plan is a service provided for Verve by System Management under the hybrid market design. System Management reviews and updates the dispatch plan as and when circumstances require.

3.3.2 Proposal:

- The Market Rules will require System Management to provide dispatch plans in accordance with the Verve Dispatch Guidelines. As a minimum System Management must provide Verve an initial dispatch plan before Verve is required to submit Balancing offers/bids.

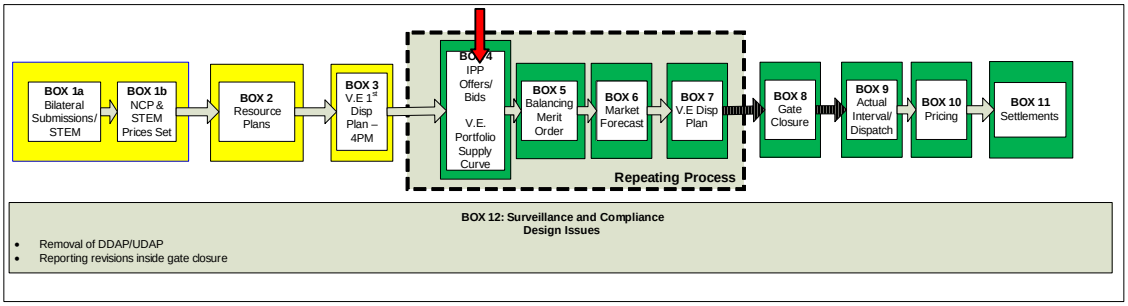
- The Rules will also need to ensure that System Management has the necessary information to account for expected IPP/Verve standalone Facility generation in preparing the Verve dispatch plan (e.g. refer forecasting box 6).

3.4 BALANCING OFFERS/BIDS AND VERVE ENERGY PORTFOLIO SUPPLY CURVE AND LOAD FOLLOWING ANCILLARY SERVICE OFFERS (Box 4)

3.4.1 Purpose:

This section explains how bids and offers will be formulated for Balancing and Load Following Ancillary Services (LFAS) from both IPPs and Verve Energy (Verve) in the context

of the implementation of the competitive Balancing market. Given that Verve ~~E~~ will remain the default balancer.



3.4.2 Proposal:

Form of bids and offers

- Initial bids/offers for Balancing and Ancillary Services to be submitted by Verve and IPPs at (say 4pm to 5pm).

- As a minimum, Verve will be required to submit a ~~portfolio supply curve~~Portfolio Supply Curve for each trading interval comprising multiple pairs of sent out MW and price per MWh for its available capacity. This curve will be required to be submitted at the same time as the first IPP b~~B~~ids/o~~O~~ffers, approximately 4pm or 5pm~~PM~~)

- Verve will be able to submit bids/offers the same as IPP facilities if Verve chooses to separate out a Facility (or facilities) from its portfolio (and reduce capacity offered in its portfolio accordingly). IPP (and Verve ~~stand alone~~standalone facilities) bids/offers on a Facility basis stating MW range, price:

    - IPPs *must* submit a price for dispatch above Resource Plan up to the full capacity of each Facility (no change from current).

    - IPPs *may* divide the capacity between Resource Plan and full capacity into up to [5] bands – these will form the basis for upward Balancing tranches in the Balancing merit order.

    - IPPs must submit a price for dispatch below Resource Plan including for decomittment (no change from current arrangement for a price within standing data for emergency de-commitment).

    - IPPs *may* divide the capacity below Resource Plan into up to [5] bands. These will form the basis for downward Balancing tranches in the merit order. Strongly negative prices would be expected below minimum load of generators seeking to avoid decommitment.

All capacity expected to be available from a Facility must be included in bids/offers.

- Intermittent and non scheduled resources that can only control reduction in output will be able to provide a price for Balancing down. ~~–~~System Management will dispatch these resources down to the extent of prevailing output at the submitted price ~~(~~e.g. wind

facilities might submit a bid (unspecified quantity) at –ve $40 and System Management will dispatch the prevailing output down if the price would otherwise fall below –ve $40. (Also see boxes 5, 6 and 9).

Ancillary Service offers:

Registered (technically pre qualified) IPP and Verve standalone LFAS Facilities may submit:

- Aan enablement price ($/MW),
- upward capability (MW),
- downward capability (MW); and
- Steady State Ancillary Service Base point (SSASB) a pre loading quiescent operating level (MW). The SSASB will reflect the any pre loading required when no Ancillary Service is being called on (e.g. system frequency at 50Hz) but is needed in order for the relevant Facility to be capable of providing the service such as part loading of gas turbines.

Verve Energy will be required to submit a ~~portfolio supply curve~~Portfolio Supply Curve for the provision of LFAS including:

- An enablement price per tranche ($/MW);
- upward capability per tranche (MW); and
- downward capability per tranche (MW).

Joint Balancing and Ancillary Service Conditions:

Offers (by IPP and V~~v~~erve standalone Facilities) to provide Balancing and Ancillary Services will be presumed to be mutually exclusive and that Market Participants will be indifferent about which (if either) service is accepted based on the prices submitted. This will mean that a Balancing offer for +/- 30MW and LFAS offer of +/- 20MW can be made for a Facility with a capacity of 200MW providing the Resource Plan is for no more than 170MW. Market systems will determine which combination of Balancing and LFAS it is appropriate to accept at the time of dispatch e.g. –30MW Balancing with 0MW LFAS or 10MW Balancing and 20MW upward LFAS. Final selection will be made by System Management on the basis of data available just prior to time of dispatch.

An alternative approach whereby A~~a~~ncillary S~~s~~ervice providers would be pre-determined would require a separate consideration of offers to provide A~~a~~ncillary S~~s~~ervices and for those parties whose offers were accepted to submit R~~r~~esource P~~p~~lans and B~~b~~alancing offers adjusted for those offers. Consistency between capacity, R~~r~~esource P~~p~~lans, B~~b~~alancing and A~~a~~ncillary S~~s~~ervice amounts would need to be validated. An additional market process would need to be introduced.

Because submissions for provision of Bbalancing and Aancillary Sservices are to be made simultaneously and are to be conditional, the submissions from participants will be relatively simple. Market systems (software) will be used to select the combination of successful providers and this selection process can be relatively simple or involve complex trade-offs between Bbalancing and Aancillary Sservices. Such a framework allows for simple initial arrangements that can be refined over time by changing the design of the software support within market processes used by both IMO and System Management without need for subsequent changes to submissions.

Importantly details of the timing of submissions, resubmissions and reassignment of Aancillary Sservice duty should be chosen to align with the broader Bbalancing market design and design of software support and processes used by System Management.

Resubmissions:

In order to ensure System Management is presented with accurate information about the quantity available from each Facility and to ensure the prices for dispatch of Verve and IPP resources reflect changes in costs across each day:

- Verve will be eligible to re-submit its Portfolio Supply Curve at the beginning of the trading day (say 8–am) and/or when a Facility within the PSC experiences a demonstrable physical outage to one of the Facilities within the ~~Portfolio Supply Curve~~PSC.

- IPPs and Verve (in respect of resources it elects to submit on a Facility basis) may re-submit up to specified rolling gate closure times (see box 8).

Assessment of conditional Balancing and Ancillary Service offers:

The objective of the assessment is to determine as close to optimum mix of Balancing and Ancillary Service providers at any given time. This section provides an ~~en~~ example of a possible framework to select Aancillary Sservice providers – in effect the framework for support software or processes that could be employed. Simpler or more complex frameworks may be appropriate initially and over time. In principle the selection process should account for enablement costs, any SSASB and the resultant Balancing costs and may for example see more expensive Ancillary Services selected to allow cheaper Balancing at an overall lower cost than selecting Ancillary Service only on the enablement cost for Ancillary Service.

Ideally, selections would be based on a full co-optimisation analysis of Balancing and Ancillary Services. A move to full co-optimisation would be a complexity not warranted at such an early stage of an Ancillary Service market. As such approximate or rules based approaches will be needed (Note: Tthe design allows for future development of a more complex selection criteria if needed).

Subject to further refinement before operation under new rules commences, the initial selection procedure will involve:

- A LFAS merit order established by System Management [4] times per day and as appropriate at the discretion of System Management following material changes in operating conditions; and

- The LFAS merit order to be based on minimising the cost of LFAS enablement payment and estimates of the average constrained on/off payments for any SSASB for the relevant period the merit order applies for (e.g. 6 hours). Enablement payments will be specified in Market Participants submissions and constrained on/off payments will be the difference between the market Balancing price and the price for Balancing submitted by the Market Participant. Initially the LFAS merit order will not normally be reviewed in the event of Balancing resubmissions other than at the [4] specified review times.

The procedure recognises that if all Resource Plans and demand forecasts are accurate and system frequency is steady at 50Hz then no Balancing and no LFAS will be dispatched. In this circumstance if no pre loading is required Balancing costs will be zero and unaffected by enablement of facilities to provide LFAS. The only cost relevant to selecting which Facility to provide LFAS will be the LFAS enablement charge.

In the case where a Facility can only provide LFAS if it is pre loaded to a SSASB, the BMO will be adjusted (see Box 5). The LFAS provider will then be entitled to receive a constrained on/off payment and different sources of Balancing will be required. The procedure requires an estimate of the average constrained on/off payment which will be based on the forecast average Balancing price (from the amended BMO). The use of average prices over a number of hours, the normal fluctuations in demand and intermittent generation as well as changes to Balancing submissions will mean that the Balancing price in this calculation will often differ from the final price meaning that there is a risk that when assessed after-the-fact the order in which LFAS was called will be inefficient. Monitoring of the market should include an assessment of the level of inefficiency as one factor in considering the benefit of refinement of the procedure.

Additionally there will be a mechanism within the Market Rules that will require selection to be on the most efficient basis that is practicable in accordance with available decision support tools and a procedure to be developed by the IMO. The selection methodology can be reviewed periodically (potentially each 6 months in consultation with Market Participants). This approach will establish the principle in the Market Rules but allow progressive improvement on a procedural basis

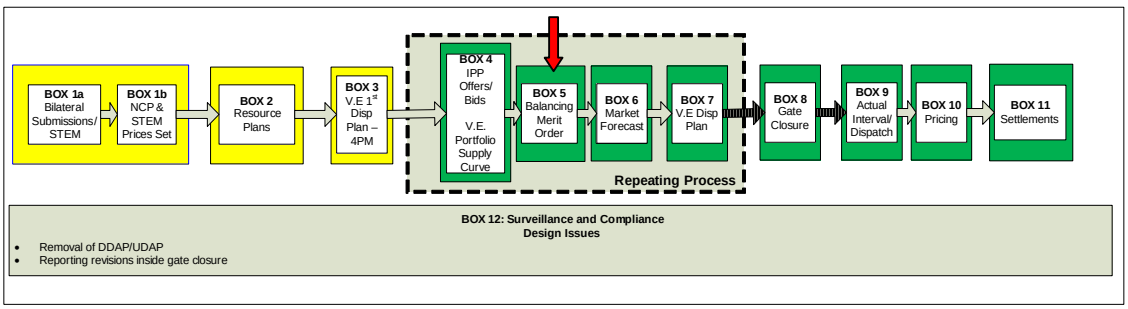
Verve standalone Facilities:

Verve Ee~~e~~nergy will have the ability to elect to submit a “standalone” Facility basis on a trial basis for one month prior to formal removal from the portfolio. Verve Energy will be required to seek System Management (or IMO?) approval for standalone status of a facility at least 1 week prior to the facility being split out on either a trial or permanent basis.

3.5 BALANCING MERIT ORDER (Box 5)

3.5.1 Purpose:

This section explains how the Balancing Merit Order (BMO) described above will be constructed.



3.5.2 Proposal:

- A Market BMO and a ~~Real Time~~Final BMO ~~(RTBMO)~~ will be developed. The Market BMO will be based on submissions made prior to a defined period before trading the relevant interval (e.g. Facility gate closure). At that time, the Market BMO will become the ~~RTBMO~~Final BMO. The ~~RTBMO~~Final BMO will continue to be updated as circumstances change and submissions need to be updated (for example, due to a Facility failure) and will be used by System Management for dispatch. Pricing will be based on the ~~final Real Time~~Final BMO for each trading interval.

- The BMO for each trading interval will be created by inserting Facility Balancing submission quantities (IPP or Verve standalone facilities) into the Verve Portfolio Supply Curve (~~Portfolio Supply Curve~~PSC) in price order. For Facility offers/ bids, maximum Facility ramp up and down rates will also be identified in the BMO.

- Unscheduled / intermittent generation will be included in the BMO based on respective Balancing price submissions and forecast Facility quantities. Inclusion in the ~~RTBMO~~Final BMO will be based on their Balancing price submissions and the prevailing capability, which will be available for dispatch by System Management.

- Currently the market rules treat intermittent load as a non-dispatchable load (other than the fact it is not required to pay its proportion of IRCR associated with the temperature dependant part of the capacity procured). As such, the demand associated with an Intermittent Load would be eligible to participate in Balancing in the same way as any other non-dispatchable load (all be it with greater flexibility).

- The BMO/~~RTBMO~~Final BMO ~~may also~~will not incorporate curtailable, dispatchable and interruptible loads. ~~so that they can be dispatched downwards in accordance with Balancing price submissions.~~ These load types should be excluded from the initial implementation of the Balancing market, as the integration of the various load types would require significant rule changes and complexity.

- Offers or bids with identical prices will be identified/linked in the BMO/ ~~RTBMO~~Final BMO and subject to tie break rules. Their treatment in forecasting and dispatch is discussed later.

- Note that it will not be practical to identify Verve liquids facilities specifically within the BMO/~~RTBMO~~Final BMO unless Verve submits them for Balancing on a Facility basis~~.~~

i.e. quantity/price pairs within Verve's ~~Portfolio Supply Curve~~PSC are not linked to individual facilities. Discussed further in relation to dispatch.

3.5.3 Further work:

- ~~Review impact on mechanics of Intermittent Loads in the BMO.~~
- ~~Incorporating curtailable, dispatchable and interruptible load into the BMO.~~
- The exclusion of load types from active participation in the Balancing market will require an appropriate strategy for handling dispatchable/interruptible load types. This will be determined between the IMO and System Management and initially only for the load types that currently exist.

3.5.4 Example:

Consider the following (stylised) scenario with Verve and 2 IPP facilities. For now it is assumed that Verve submits a Portfolio Supply Curve for its entire portfolio (i.e. Verve does not present any standalone Facility based submissions). It is also assumed that there is no ~~curtailable load or~~ unscheduled/ intermittent generation.

Verve Submission		
Tranche	**MW**	**$/MWh**
14	50	$420
13	400	$276
12	200	$60
11	80	$40
10	300	$35
9	60	$30
8	20	$25
7	20	$5
6	100	$0
5	40	-$3
4	80	-$5
3	150	-$30
2	200	-$50
1	360	-$275
Tot Capacity	2,060	

IPP1 Facility Submission (Resource Plan = 50 MW[1])		
Parameter	**MW**	**$/MWh**
Up 1	10	$50
Down 1	15	$10
Down 2	25	-$275
Total Capacity	50	
	MW/min up	**MW/min down**
Max Facility ramp rate	2	2

IPP1 submitted a Balancing bid for some of the capacity below its Resource Plan at a very low price. That capacity would not be dispatched down and/or off unless System Management has no other options available within the ~~RTBMO~~Final BMO for normal Balancing purposes, creating an overall security of supply situation, or has to dispatch the Facility down for a localised security of supply situation.

IPP2 Facility Submission (Resource Plan = 100 MW[2])		
Parameter	**MW**	**$/MWh**
Up 1	50	$70
Down 1	50	$30
Down 2	50	-$275
Total Capacity	150	
	MW/min up	**MW/min down**
Max Facility ramp rate	3	3

Also assume that a wind farm has bid in to be dispatched down for negative $40 per MW and the participant has forecast that the Facility will be operating at 50 MW ~~for the duration~~at the end of the interval.

Submissions would be aggregated into a M~~m~~arket BMO for System Management purposes along the following lines. (In practice, the BMO would also identify any identically priced offers and for Facility submissions maximum ramp up and down rates).

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[1] Resource P~~p~~lans will be in the form of ramp rate and MW target as discussed earlier (Box 2). This is ignored here for simplicity but will need to be taken into account in forming D~~d~~ispatch I~~i~~nstructions (Box 9). For example, if a Balancing offer is to be dispatched and the Facility will already be ramping in accordance with its Resource Plan.

[2] Resource P~~p~~lans will be in the form of ramp rate and MW target as discussed earlier. This is ignored here for simplicity but will need to be accounted for in formulating dispatch instructions.

	Tranche MW Range		Cumulative MW Range[3]	
ID	From	To	From	To
VE PSC	1,610	2,060	1,760	2,210
IPP2	100	150	1,710	1,760
VE PSC	1,410	1,610	1,510	1,710
IPP1	40	50	1,500	1,510
VE PSC	1,030	1,410	1,120	1,500
IPP2	50	100	1,070	1,120
VE PSC	950	1,030	990	1,070
IPP1	25	40	975	990
VE PSC	560	950	585	975
Wind1 Down	50	0	635	585
VE PSC	360	560	435	635
VE PSC	0	360	75	435
IPP2	0	50	25	75
IPP1	0	25	0	25

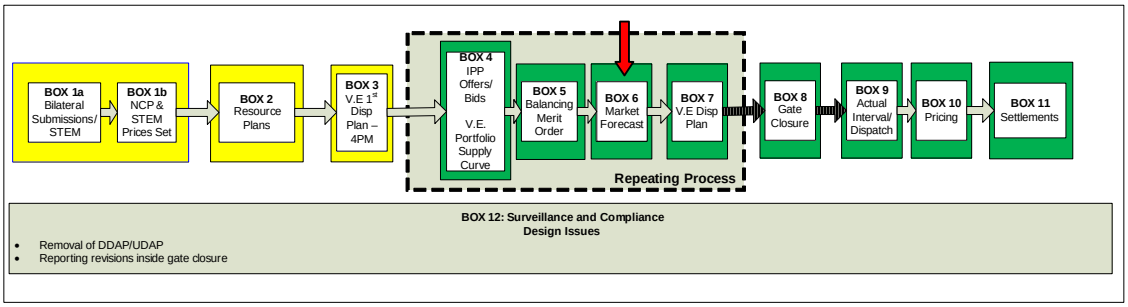
Information in resubmissions would be used to update the BMO and the ~~RTBMO~~Final BMO. Accepted Ancillary Service offers that require pre loading away from Resource Plan in the case of IPPs or Verve where a defined MW quantity is required will be reflected in the BMO as appropriate – for example where partial loading is required on a Facility that would not otherwise be operating would be seen as an increase in the capacity at the bottom of the BMO/~~RTBMO~~Final BMO. Similarly if acceptance of an Ancillary Service offer that was conditionally linked to Balancing and will reduce the amount available for Balancing then the capacity at the bottom of the BMO/~~RTBMO~~Final BMO will increase and the relevant Balancing tranche decrease.

3.6 MARKET FORECAST (Box 6)

3.6.1 Purpose:

This section describes the market forecasts that are envisaged.

[3] Aggregate MW range added.



3.6.2 Proposal:

- Market Participants will be provided with regular 2 hourly (rolling) forecasts of the Balancing price and also their expected Balancing quantity to help them to make informed bids and offers, and prepare for any likely dispatch. Forecasts will extend over the period for which Balancing submissions apply~~.~~ i.e. forecasts issued today before initial bids and offers for the following trading are due (say prior to 5~~4~~pm) will cover trading intervals out to 8am tomorrow. Forecasts issued after that time, will cover trading intervals out to 8am the day after. These future trading intervals are referred to as the Balancing Horizon.

- The forecasts are especially important in relation to Market Participants decisions about commitment, de-commitment and management of constrained fuel supplies etc and resubmissions to give effect to these decisions.

- It is proposed that the following forecasts will be provided at regular intervals leading into gate closure:

    - Expected system generation requirement (to all Market Participants);

    - Expected overall Balancing quantity (to all Market Participants);

    - Expected overall wind/non-scheduled load ~~and curtailment~~ (to all Market Participants)

    - Expected Balancing price (to all Market Participants);

    - Expected B~~b~~alancing price if total generation requirements are +/- 1% from forecast; and

    - Expected Facility Balancing quantities (to relevant Market Participant only) including identification of any security constrained requirements.

- From the M~~m~~arket BMO and forecast total generation requirements, taking account of forecast unscheduled generation, a market forecasting model will determine expected dispatch quantities for facilities (IPP and Verve standalone) and Verve's portfolio and expected Balancing prices.

- The initial forecasts for a trading day will effectively be a system generation schedule covering the rest of the current trading day out to the end of the following trading day i.e. the Balancing Horizon. System Management will review this information and advise the

IMO of any constraints that need to be applied to generation within the schedule (for example due to a local transmission outage/ ~~-~~constraint). The IMO will ~~incorporate~~ issue market advisories detailing this information ~~int~~when~~e~~ subsequent forecasts are issued.

- System Management will use forecast dispatch quantities for Verve's ~~Portfolio Supply Curve~~ PSC and IPPs (Resource Plans +/- expected dispatch of Balancing offers/ bids) in preparing and updating the Verve dispatch plan.

- The above procedure will continue to be carried out each time a bid/offer is updated by an IPP (or Verve ~~Portfolio Supply Curve~~PSC updates are allowed) with new forecasts being provided to market at regular intervals. It may also be practical to re-issue forecasts whenever there is a change to input forecasts.

- Forecasts will continue to be provided after gate closure so that IPPs can be prepared for any likely Dispatch Instructions which they might receive.

- The adequacy of the forecasts will need to be reviewed after an initial period of time (it is proposed two years). This review will need to assess the accuracy and also the usefulness to Market Participants.~~Ps~~.

Appendix A includes an overview of the above processes.

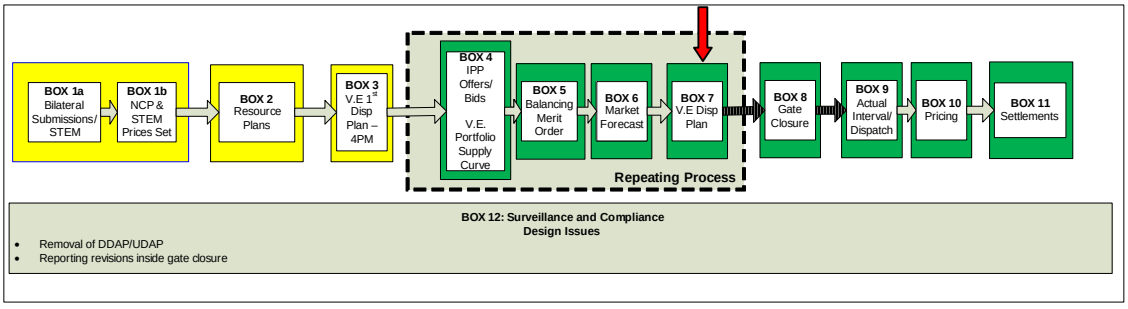
3.6.3 Further Work:

- Discussion with System Management re new systems it may require to support forecasting processes~~.~~ e.g. more real time load forecasting and/or wind forecasting tools?

3.7 VERVE ENERGY DISPATCH PLAN (Box 7)

3.7.1 Purpose:

This section explains the ongoing need for System Management to re-calculate the Verve Energy Dispatch Plan over the scheduling day to account for forecasted IPP Balancing b~~B~~ids/offers.



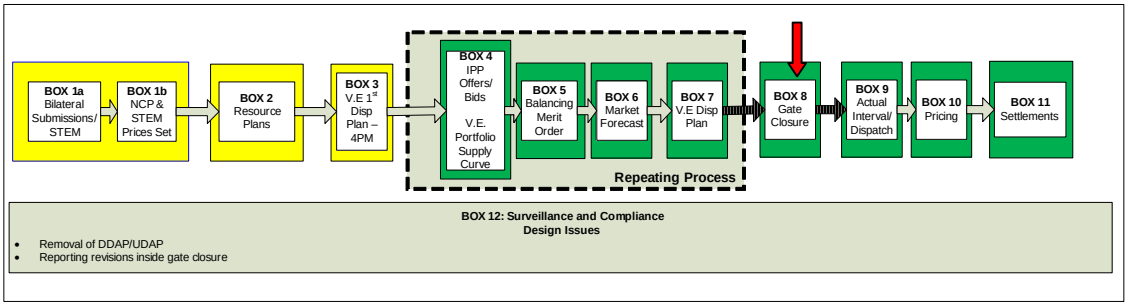
The Verve Energy D~~d~~ispatch P~~p~~lan is prepared by System Management as a service to Verve within the hybrid design and reviewed as needed. In updating the Verve Energy D~~d~~ispatch P~~p~~lan, System Management is in effect undertaking a review and revisions to

Balancing bids/offers for facilities within the Verve ~~Portfolio Supply Curve~~PSC leading up to resubmissions (subject to ~~Portfolio Supply Curve~~PSC gate closure).

3.8 GATE CLOSURE (Box 8)

3.8.1 Purpose:

This section explains gate closure or the time up to which Market Participants may resubmit specified market information and offers/bids.



3.8.2 Proposal:

- At fixed gate closure times and/~~-~~or when a major change in circumstances occurs, such as a Facility failure or having to switch a Facility from gas to liquids Verve may update its P~~p~~ortfolio S~~s~~upply C~~c~~urve (PSC).

- Up to a normal rolling gate closure, say 2 hours, ahead of dispatch intervals IPPs (and Verve ~~for~~ standalone facilities) may resubmit Facility bids and offers for Balancing/Ancillary Services relative to their Resource Plan.

- Normal Facility gate closure requirements may be relaxed if System Management issues a system security advisory indicating a supply shortfall forecast or a supply excess forecast. In these cases Market Participants would be able to increase their offered quantities inside the normal gate closure period in response to a System Management supply shortfall advisory. Market Participants would be able to increase bid quantities (e.g. to effect a de-commitment) within the normal gate closure if System Management has issued a supply excess advisory notice.

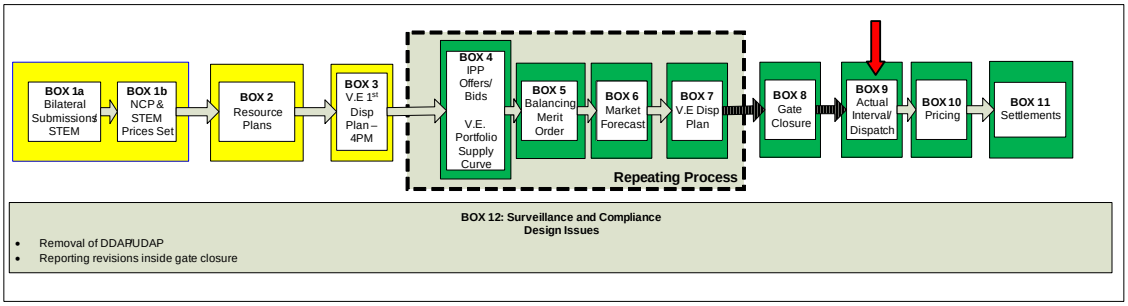
- Once normal gate closure has occurred, changes to the BMO/~~RTBMO~~Final BMO will still be required (e.g. for bona fide physical changes to offers/ bids, responses to security advisories, actual wind generation levels etc). The ~~RTBMO~~Final BMO used by System Management for dispatch will be the F~~f~~inal BMO for pricing purposes.

3.9 ACTUAL INTERVAL/DISPATCH (Box 9)

3.9.1 Purpose:

This section explains how the Balancing market structures outlined above would be implemented. It will explain Dispatch Instructions leading into a half hour period, real time

management of load over the half hour and the role of LFAS within the new Balancing Market.



3.9.2 Background:

Instantaneous supply must match instantaneous demand using production under Resource Plans, non-scheduled generation, Balancing service and Ancillary Services.

The Balancing service follows the expected trend during the half hourly dispatch interval in the difference between Resource Plans and the net of total demand, non-~~-~~scheduled resources and steady state requirements of plant providing Ancillary Services4. The L~~l~~oad F~~f~~ollowing Ancillary Service (LFAS) tracks the instantaneous difference between demand, including losses, and all other production. This principle is unchanged from the status quo.

Instructions to deliver Balancing (Balancing D~~d~~ispatch I~~i~~nstructions or Balancing DIs) will be formulated just prior to the start of each half hour in accordance with the ~~RTBMO~~Final BMO to ramp to specified MW targets at specified ramp rates at (or from) a specified time within the interval.

The primary objective of dispatch is to maintain security and minimise the cost of dispatch.

3.9.3 Proposal:

- System Management will use the ~~RTBMO~~Final BMO to formulate Balancing DIs.
- If the facilities providing LFAS are to change, relevant LFAS providers would be instructed to enable/disable the service and System Management would bring the relevant facilities into/out of the AGC system.
- Prior to a dispatch interval, System Management will estimate the underlying MW trend in total generation requirements during the next dispatch interval.
    - This quantity is called Relevant Dispatch Quantity (RDQ) for the remainder of this paper.

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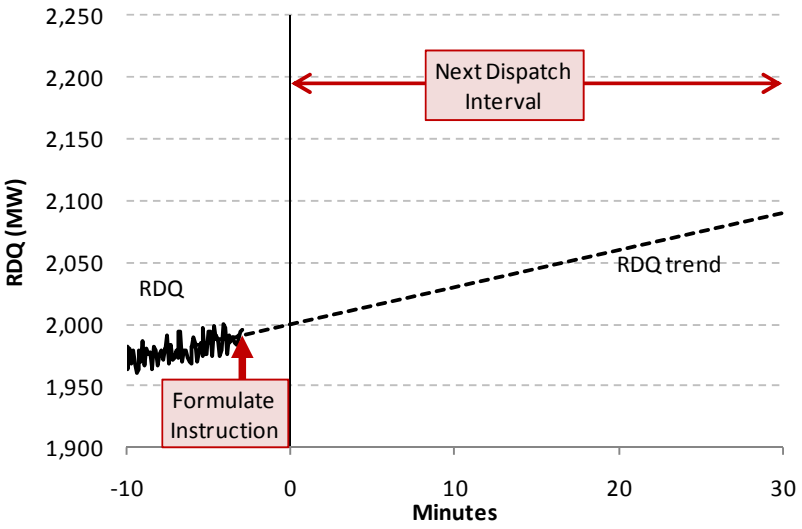
[4] See previous discussion on requirements to provide Ancillary Services.



- System Management will formulate Balancing DIs in accordance with the ~~RTBMO~~Final BMO so as to meet the expected RDQ with the objective of minimising the cost of dispatch. System Management will need to develop systems to formulate Balancing DIs. Where a Facility is selected for LFAS, AGC capability will be required and any conjoint Balancing DI would be issued via AGC. For facilities not selected for LFAS, systems will be required for System Management to issue and for Market Participants to receive Balancing ~~Dispatch Instructions~~DIs.

- System Management will have overriding authority to intervene in order to maintain security but will be expected to follow market based processes where feasible.

- System Management would continue to monitor security and Facility responses to Balancing DIs~~dispatch instructions~~ during an interval and would issue new instructions if required.

Format of Dispatch Instructions:

- A Balancing DI is an instruction to a Facility to change output:

    - For an IPP or Verve standalone Facility, an instruction is relative to Resource Plan (assumed to be zero if no Resource Plan submitted).

    - For Verve's portfolio, System Management will issue instructions to facilities to adjust their gross output so that the portfolio is dispatched to meet ~~RTBMO~~Final BMO requirements.

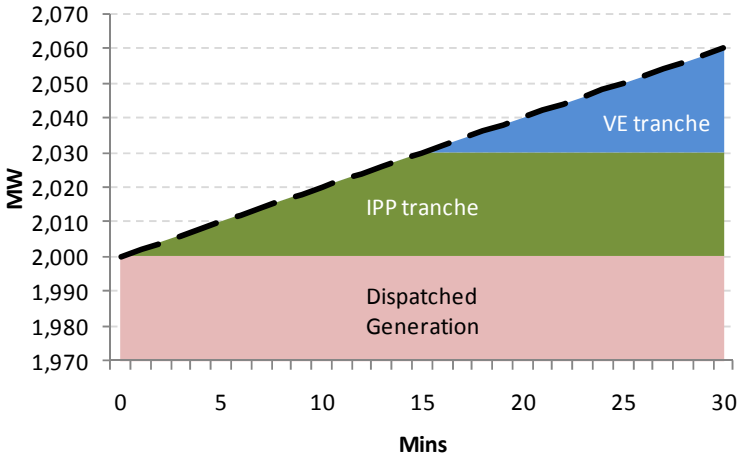
- A Balancing DI is an instruction to change output once and in one direction:

    - System Management will typically issue one only ramp rate and MW target to a Facility just before a trading interval (with LFAS compensating for residual imbalances within the trading interval).

- If necessary, System Management may need to issue new instructions within a trading interval (for example, to maintain LFAS services within their offered MW regulation ranges or to address unexpected system events within a dispatch interval).

- Subject to the above, Balancing DIs will typically be issued prior to an interval and consist of:
  - A MW target;
  - A ramp rate (less than or equal to specified maximum Facility ramp up/down rates); and
  - A time to start ramping (to distinguish clearly between the Balancing and LFAS roles, under normal circumstances this time will be no later than say 15 minutes (to be confirmed) into the interval).

- These concepts are illustrated below:

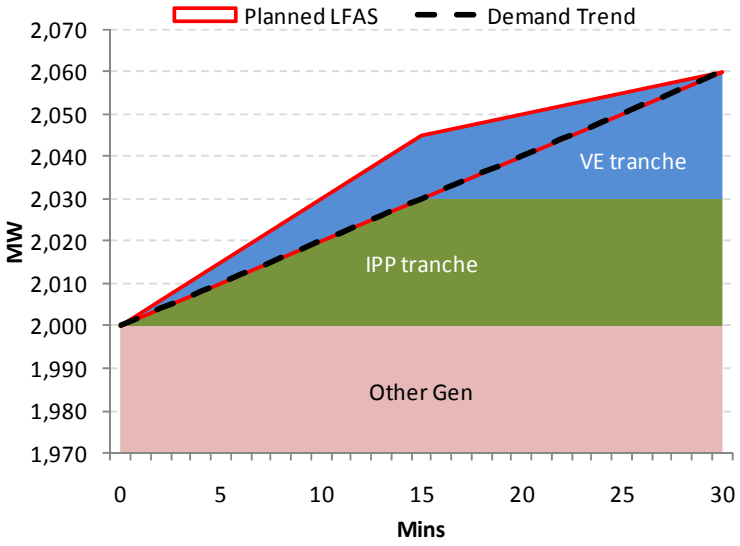


- In the example shown, an IPP Facility Balancing offer is able to be dispatched at less than its specified maximum ramping rate to follow the expected trend in RDQ (the dashed line). This minimises the use of the higher priced Verve tranche.

Planned LFAS:

- A consequence of the above methodology is that where it is necessary to dispatch multiple offer/ bid tranches in a dispatch interval, they could be instructed to ramp up linearly to an end of interval target as illustrated below.

- As illustrated, this implies a certain level of LFAS is in effect planned (aside from variations from trend) during dispatch intervals – which is called “planned LFAS” in the remainder of the paper.



Practical dispatch considerations:

- It is important to recognise that Balancing DIs will be based on market parameters which do not account for all factors that affect operation of a generating Facility within a half hour. For example; to reflect automatic governor response to system frequency changes; having to put equipment in/out of service while ramping (such as coal mills, feed pumps etc); block loading/ ramping/ hold requirements when bringing a Facility into service etc; or Facility problems/ delayed start-ups etc. As a result Balancing DIs are incapable of defining sub half hour production requirements precisely. Dispatch via AGC will reduce some of the sources of imprecision but not all and is not mandatory in order for a Facility to contribute to Balancing.

- To the extent practical, offers/ bids should take all relevant factors into account (being reasonable estimates of the capability of a Facility if dispatched) and Market Participants will be expected to follow instructions to the extent practical. Consistent and material deviations from instructions developed in accordance with bids/offers would be a compliance matter. Deviations from instructed DIs are to some extent inevitable and need to be viewed in the context that half hourly dispatch in any event is inherently imprecise, being based on estimates of trends in demand and intermittent supply during a dispatch interval, and made prior to the interval.

  While System Management is entitled to rely on instructions being implemented in accordance with offers through the market over a half hour, Market Participants will also be required to inform System Management of all relevant limitations on response to DIs. This will enable System Management to determine dispatch of Balancing and Ancillary Services across the power system as a whole.

Outstanding issues:

- As noted above, System Management will require decision support software that incorporates the above rules with the total generation forecasts and the ~~RTBMO~~Final BMO. For example, to manage the potential of multiple tranches being dispatched in an

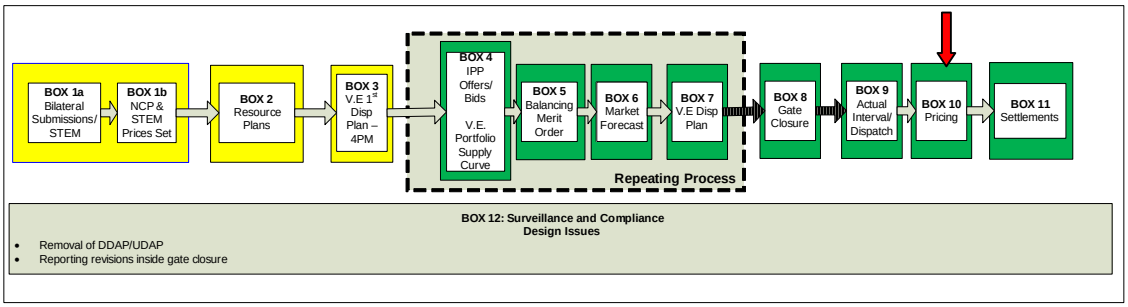
interval, including one ramping down while another ramps up, to help determine the appropriate start times, targets and ramp rates for Facility instructions (taking into account Resource Plans where a Facility is already ramping to a MW target during the interval).

- Verve liquid facilities: Verve will be able to separate dual fuelled facilities from its portfolio submission, with associated resubmission flexibility up to gate closure. Verve will also be able to update Facility submissions if a material change in circumstances criterion is met (need to define). The alternative of requiring System Management to dispatch IPP submissions ahead of Verve liquid facilities (as now) and adjusting the ~~RTBMO~~Final BMO could be considered further but is problematic given that the Verve ~~Portfolio Supply Curve~~PSC is not Facility specific.

3.10 PRICING (Box 10)

3.10.1 Purpose:

This section describes the calculation of prices within the short term operation of the WEM.



Balancing Price:

Objective: B~~b~~alancing price to reflect the marginal price of resources dispatched by System Management to provide actual balancing from IPP and any Verve facility prices and Verve PSC prices.

3.10.2 Proposal:

- The balancing price is to be calculated ex post from the ~~Energy~~ Relevant Dispatch Quantity (~~ERDQ~~RDQ) and the ~~RTBMO~~Final BMO for the half hour trading interval, based on actual sent out MW (SCADA) levels for facilities and the Verve portfolio at the ~~start~~ end of each interval and maximum facility ramp rates.

- Constrained on/off payments will be made to participants dispatched by System Management where the price of the bid or offer dispatched is inconsistent with the balancing price. This is discussed under Settlements.

3.10.3 Details:

- The ~~ERDQ~~RDQ is the total amount of energy generated ('sent out') by facilities ~~in~~ at the end of the trading interval. This will need to be calculated using SCADA given

delays in obtaining metering data and lack of metering at Verve facilities. ~~Ideally the ERDQ would be calculated by averaging SCADA readings across the trading interval. Alternatively, end of period readings for the current and previous intervals could be averaged.~~

- The RDQ will be calculated using end of interval MW values as this mirrors the process System Management (SM) will use for determining Dispatch Instructions (i.e. SM will estimate the trend in generation requirements during the interval and issue instructions in accordance with the BMO).

- It is possible, as with any measured parameter, that SCADA totals may not always be available and the rules/systems will need to address that (as now). It is proposed that if validated SCADA totals are unavailable within a stipulated timeframe, values will be estimated by interpolation from adjacent intervals or, if this is impractical, the most recent forecast price issued prior to the interval would suffice as a backstop.

- The methodology involves calculating the amounts of energy that could have been generated in merit order from each tranche in the ~~RTBMO~~Final BMO, and in the case of unscheduled supply what was actually generated, to satisfy the ~~ERDQ~~RDQ.

- The balancing price will be set the day following the trading day at the price of the marginal tranche in the above calculation.

Some other benefits of Ex-Post pricing method are as follows:

- Aligning pricing with the dispatch methodology should provide more efficient price signals than if ex-post MWh or forecast MWh were to be used.
- Constrained on/off payments will inevitably be required under any methodology but the proposed solution strikes a balance between efficient prices and the level of constrained on/off payments necessary.
- With ex-post prices based on hindsight 30 minute trends, rather than forecast MWh, improvements in dispatch performance will show up in the levels of constrained on/off payments.

Some data estimation or averaging may need to be incorporated to ensure that end of interval values are representative of 30 minute trends. This estimation would be agreed with and applied by System Management.

Pricing systems would receive a single end of period value (whether estimated or discrete) along with a Start of Interval (SOI) value per generator and End of Interval (EOI) value per Intermittent generator.

~~**Example:**~~

~~*Basic*~~

- ~~For each facility based tranche in the RTBMO, the maximum and minimum amounts of energy that could have been dispatched in the interval will be calculated. This will take~~

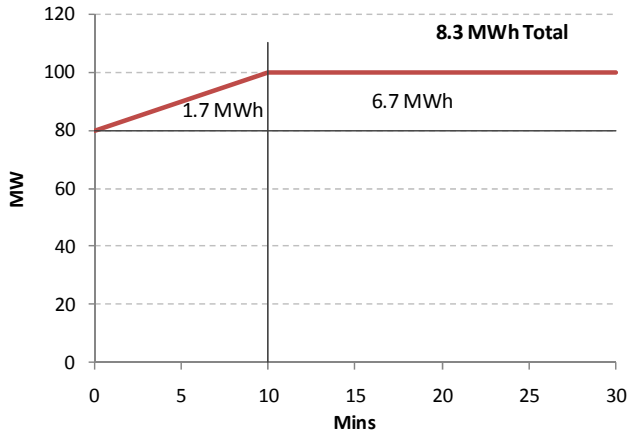
into account the amount of generation from the relevant facility at the start of the trading interval and the maximum ramping rate of the facility.

- For example, consider a 100 MW facility that is operating at its resource plan level of 80 MW at the start of an interval. Suppose the balancing submissions for that facility were as follows:

Facility Submission (Resource Plan = 80 MW flat)		
Parameter	MW	$/MWh
Offer (Up) 1	20	$50
Bid (Down 1)	80	-$275
Total Capacity	100	

	MW/min up	MW/min down
Max facility ramp rate	2	5

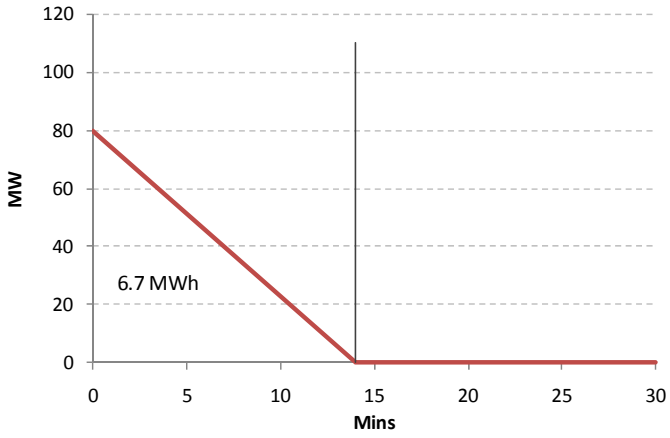
- The maximum amount of energy that the facility could be instructed to generate from the $50 per MWh tranche would be 8.3 MWh as illustrated below:



- The minimum amount of energy that the facility could be instructed to generate from the $50 per MWh would be zero (i.e. if the facility did not need to be dispatched off its resource plan).

- The maximum amount of additional energy that the facility could be instructed to generate from the tranche at negative $275 per MWh would be 40 MWh (i.e. if the facility did not need to be dispatched off its resource plan level).

- The minimum amount of energy that the facility could be instructed to generate at negative $275 per MWh would be 6.7 MWh as depicted below.



- These calculations would be carried out for each facility based tranche in the RTBMO.
- For each Verve portfolio tranche, the maximum and minimum amounts of energy that could have been dispatched would be the maximum quantity offered and zero (no ramp rate constraints).
- The dispatchable quantities would then be sorted in price order (as in the RTBMO) to establish the balancing price with reference to the ERDQ. For example, as in the stylised example below. If the ERDQ was anywhere between 540 and 548.3 MWh, the balancing price would be $50 per MWh (set by the shaded IPP offer 1).

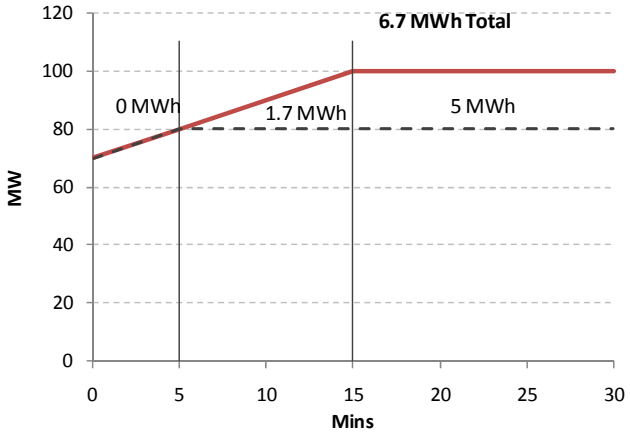
Tranche	Min MWh	Max MWh	$/MWh	Cumulative MWh From	Cumulative MWh To
VEPSC3	0	200	$275	548.3	748.3
IPP offer 1	0	8.3	$50	540.0	548.3
VEPSC2	0	300	$40	240.0	540.0
VEPSC1	0	200	-$50	40.0	240.0
IPP bid 1	6.7	40.0	-$275	6.7	40.0

Accounting for ramping within resource plans

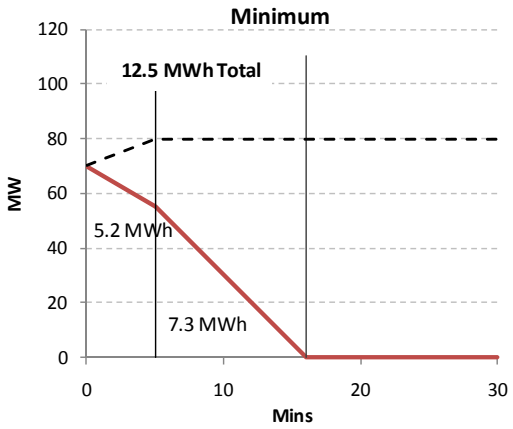
- In the above example, the IPP is operating at the resource plan level at the start of the interval and has a fixed resource plan throughout the interval (i.e. no change in resource plan level (NCP / own load) from the previous interval).
- In practice, the facility's resource plan may include ramping to a new level (refer box 2). For example, assume that in the above scenario, the facility is operating at a resource plan level of 70 MW at the start of the interval and that the resource plan ramps up to 80 MW[5] at 2 MW per minute. As illustrated below, the maximum energy that could be dispatched from the IPP offer 1 tranche is 6.7 MWh. As before, the

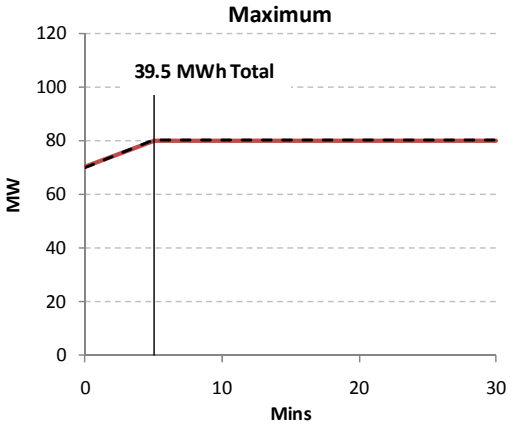
[5] e.g. 40 MWh NCP.

minimum is zero (if it does not need to be dispatched off resource – the black dashed line).



- For the IPP bid 1 tranche, as illustrated below, the minimum and maximum amounts of energy able to be dispatched in the interval are 12.5 MWh and 39.5 MWh respectively.





- The dispatchable energy for IPP offer 1 and IPP bid 2 tranches in the pricing table would then be as follows (changes from the previous table shaded):

Tranche	Min MWh	Max MWh	$/MWh	Cum MWh From	Cum MWh To
VEPSC3	0	200	$275	546.3	746.3
IPP offer 1	0	6.7	$50	539.6	546.3
VEPSC2	0	300	$40	239.6	539.6
VEPSC1	0	200	-$50	39.6	239.6
IPP bid 1	12.5	39.6	-$275	12.5	39.6

~~*Unscheduled generation*~~

- ~~Suppose the above example is extended to include an unscheduled generation facility. Its actual energy production for the interval would be inserted into the above table at the bid price in its balancing submission. For example, suppose a wind farm had submitted a balancing submission of negative $40 per MWh (refer examples in box 5). If the wind farm actually produced 30 MWh during the interval, the above table would be as follows:~~

- Tranche	- Min MWh	- Max MWh	- $/MWh	Cum MWh From	To
VEPSC3	0	200	$275	576.3	776.3
IPP offer 1	0	6.7	$50	570	576.3
VEPSC2	0	300	$40	270	570
Windfarm	0	30	-$40	240	270
VEPSC1	0	200	-$50	40	240
IPP bid 1	12.5	39.6	-$275	12.5	40

Constrained on/off

Constrained on/off payments will be made to participants dispatched by System Management where the price of the bid or offer dispatched is inconsistent with the balancing price. This is discussed under Settlements.

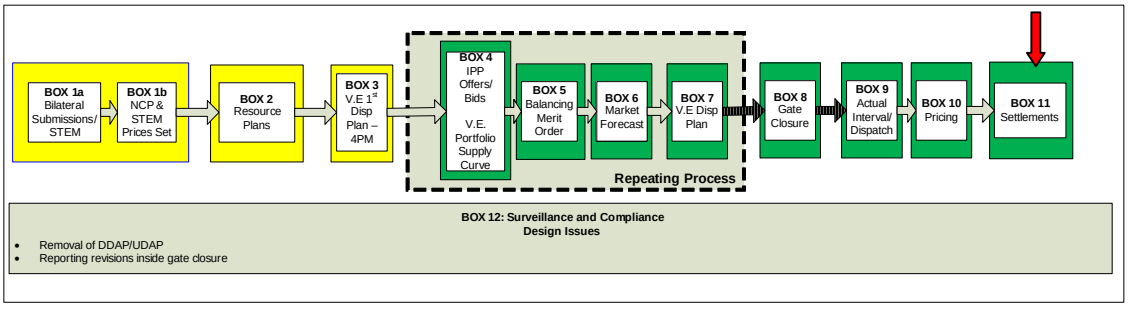
~~***3.10.4 Further work:***~~

~~The inclusion of load curtailment in the ERDQ.~~

3.11 SETTLEMENTS (Box 11)

3.11.1 Purpose:

This section describes the primary settlement transactions.



In principle settlement transactions are unchanged from the current market in that

Parties providing Balancing up are paid the Balancing price and parties Balancing down pay the Balancing price.

New transactions are to be created in relation to constrained on/off payments where payments at the Balancing price are inconsistent with participant offers. (For system security constrained on/off situations, the net result will effectively be the same under the current pay as bid constrained on/off regime).

Principle:

- A market transaction will exist whenever metered half hour (hh) dispatch differs from hh NCP (no change).
- A market transaction will have occurred when an IPP Facility or Verve standalone Facility output is increased or decreased from Resource Plan or when Verve's portfolio is dispatched above or below residual NCP (i.e. NCP less any Verve standalone Facility Resource Plans) as a result of:
    - Any differences between NCP and Meter Schedules
        - ~~o~~ Eligibility for constrained on/off will be subject to ~~A~~an instruction from System Management for Balancing.
    - An instruction from System Management to load to a specified level, the SSASB, (consistent with the offer from the market participant in order to be capable of providing Ancillary Service (e.g. part loading for LFAS). See also constrained on/off payment).
    - Automatic response from individual plant providing Ancillary Service.
- All market transactions will be paid at the Balancing price.
- Under defined circumstances a constrained on/off payment will also be made (discussed below).
- Parties selected to provide Ancillary Service will also receive an enablement payment in accordance with the design of the particular Ancillary Service.
- Market Participants dispatched by System Management to operate at an SSASB that is different to their Resource Plan will be entitled to be paid a constrained on/off payment (as appropriate) in addition to payment for the market transaction at the Balancing price as noted above.
    - Note: D~~d~~ispatch of energy as part of the delivery of an Ancillary Service around a relevant SSASB will not attract a constrained on/off payment (any cost impacts will be presumed to be reflected in the enablement fee submitted by the Market Participant).
- Windfarms will receive payment for being dispatched down based on difference between actual output and ex-post estimate of actual output possible during the interval.

Settlement of constrained on/ off amounts:

Objective: To recompense Market Participants where the price of a Facility Balancing offer or bid dispatched by System Management is inconsistent with the calculated Balancing price.

- A Facility dispatched by System Management above (below) its Resource Plan will pay the market Balancing price for the quantity involved (normal settlement of Balancing amounts). Constrained on or off payments may also be required to compensate for differences between the Balancing price and the price of offers or bid tranches dispatched by System Management.

- For example, suppose the Balancing price is determined to be $15 per MWh. A Market Participant that was dispatched down below its Resource Plan by System Management and had a bid price of $10 per MWh, would have expected to pay that amount, not $15/MWh. So the Market Participant would receive a 'constrained off' compensation payment of $5/MW to compensate for the difference.

- This holds for negative priced bids as well. For example, had the Balancing price been negative $15 per MWh and the Market Participant's bid price negative $20 per MWh, the IPP would have paid negative $15 per MWh (i.e. received $15/MWh) but expected to have paid negative $20 per MWh (i.e. receive $20 per MWh) for the quantity of downwards Balancing it provided. In this instance, compensation would be paid at negative $5 per MWh (the Market Participant would receive $5 per MWh) for the quantity of downwards Balancing it was instructed to provide).

- The constrained off (or on) event may have been because of a system security situation[6] (in effect as now) or (a new requirement) due to approximations that must be made in formulating Dd~~d~~ispatch Ii~~i~~nstructions to follow expected trends in dispatch intervals and in calculating half hourly Balancing prices ex post.

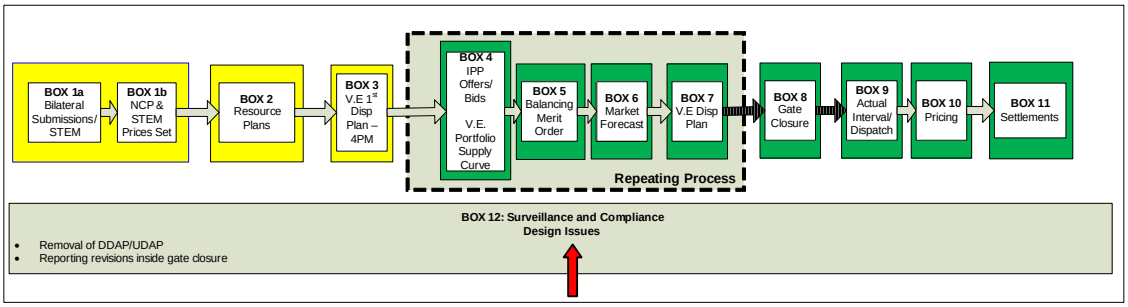
- Constrained on/off payments will be allocated to Market Customers proportional to their energy use in the interval the payment was made.

3.12 MARKET POWER, SURVEILLANCE AND COMPLIANCE (Box 12)

3.12.1 Purpose:

This section explains the expanded role of surveillance and compliance monitoring in the context of the new competitive Balancing Market.

[6] The WEM currently provides for as bid payments for security constrained dispatch of IPP facilities. Going forward, that will still be the case $Q_{dispatch}$ * PriceAsBid (now) is same as $Q_{dispatch}$ * $Price_{Balancing}$ + $Q_{dispatch}$ * ($Price_{Balancing}$ - $Price_{bid}$)



3.12.2 Background:

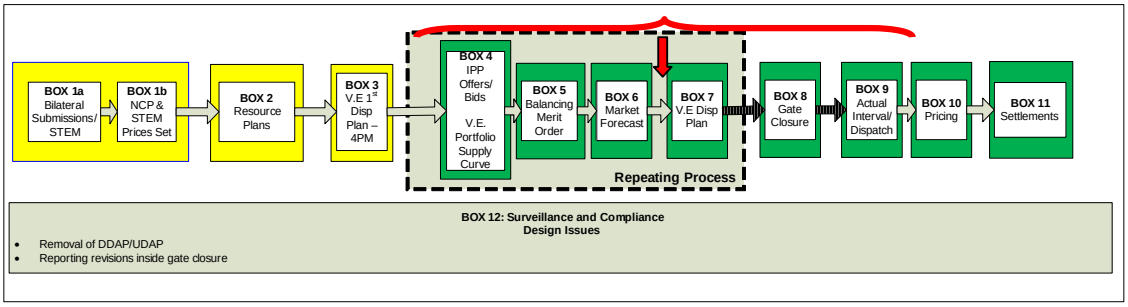
Market power can have a positive or negative impact on market outcomes. The ability to exercise market power detrimentally to the objective of the market is common in many electricity markets. On the other hand the threat or actual exercise of temporary of market power can be a key incentive for competitors to enter a market or reduce costs. Detrimental market power can be managed by careful design of the market to incentivise participants to bid at SRMC and/or including provisions such as the requirement in the WEM for parties with market power to bid at SRMC, by countering the effects through contracts and also by ex post penalties or threats of penalty.

Monitoring and surveillance of a market can be used to identify both the exercise of market power and compliance with market rules. Compliance with market rules is important for the orderly conduct of an electricity market especially where coordination of operation must occur in very short timescale. Compliance is also important where rules have been designed to manage market power.

This section briefly notes the impact on market power, surveillance and compliance of the package of changes proposed in this document.

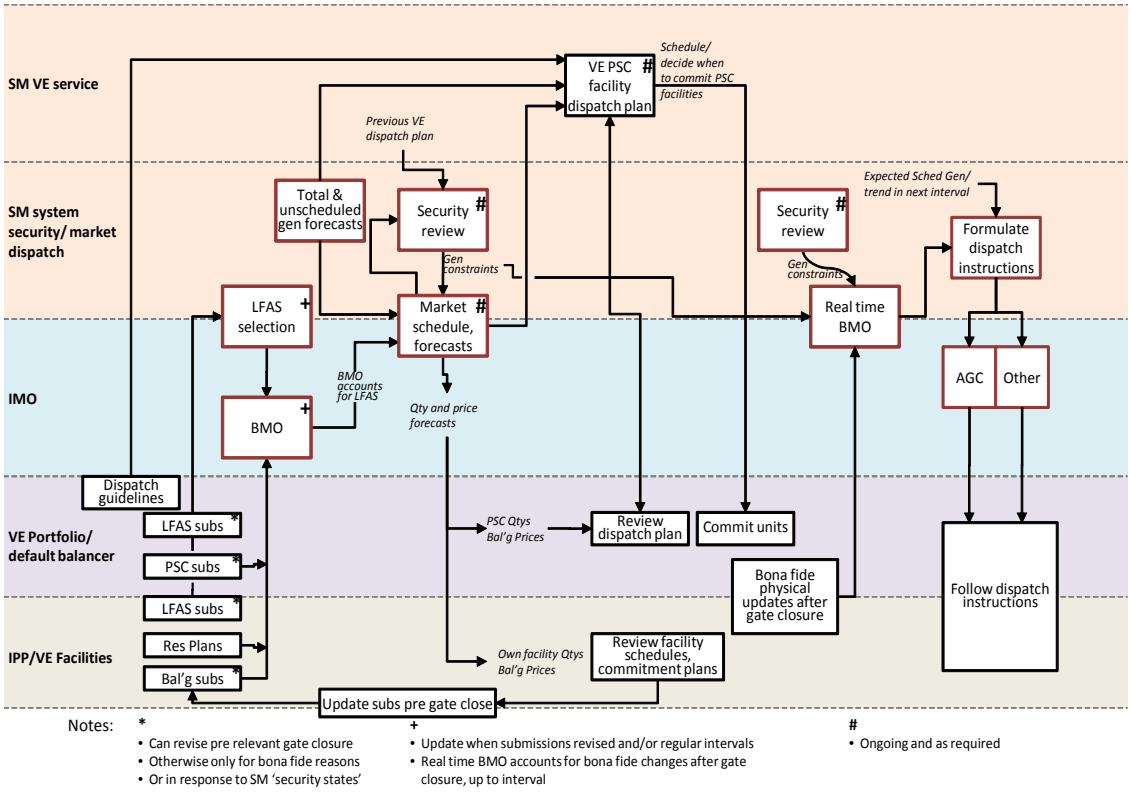
- Compliance with formation of Resource Plans given that UDAP and DDAP penalties are proposed to be removed and the requirement is to be relaxed when NCP changes;
- Surveillance of the basis for renominations – given the proposal to allow renominations under some circumstances such as following material change and for bona fide physical reasons specially within gate closure periods;
- Compliance with Balancing instructions;
- Compliance with provision of Ancillary Services;
- Level and reason for constrained on/off payments (to assist future development);
- Ancillary service offer prices; and
- If appropriate - Operational definition of market power and existing requirement for SRMC prices in bids/offers.

APPENDIX A: PROCESS, ROLES AND RESPONSIBILITIES



The following diagram illustrates the processes (including where process are repeated over the course of a day) and the roles and responsibilities within the proposed design described in the 12 stages.

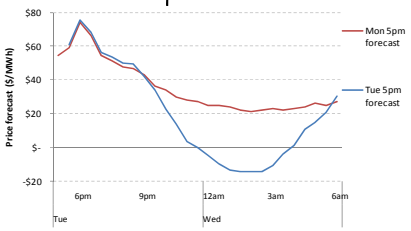
Overview of Market Processes



APPENDIX B: OVERNIGHT EXAMPLE

Overnight example

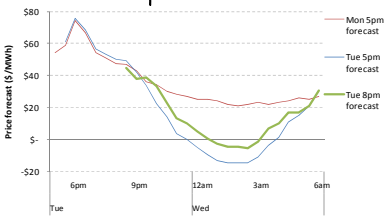
- Initial 5pm market forecast (scheduling day) indicates overnight prices of around $20/MWh
  - Issued 30+ hours ahead of overnight intervals
  - Issued several hours after NCPs established, resource plans submitted
- 5 pm forecast (trading day) indicates lower overnight prices
  - e.g. lower demand/ higher wind than forecast 24 hours beforehand
  - 7-8 hours before overnight intervals*

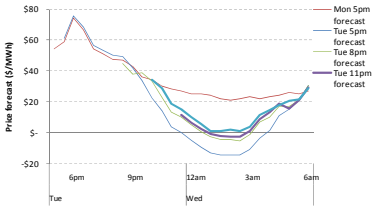


* *Had intermediate price forecasts indicated this trend, participants could have responded earlier given flexibility to revise facility submissions*

Overnight example *(cont'd)*

- A MP may consider it worth decommitting a facility and submit a bid that would do so (e.g. low –ve price)
- Reflected in later 8pm market forecast
- If de-commitment opportunity seen as worthwhile (taking start up into account etc), leave bid at gate closure
- If gate closure 2 hours out, could also leave decision until 11 pm





APPENDIX C: GLOSSARY