

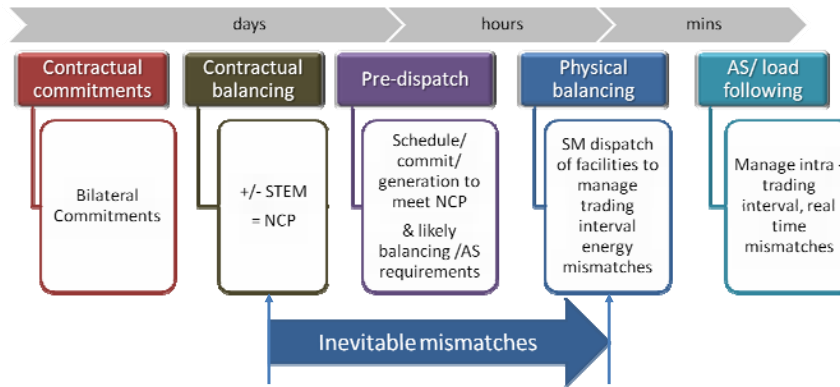
Increasing Participation in Balancing Support

MDIWG – 9 October 2010

Introduction

- **MRDT thoughts on increasing participation in balancing were presented at MDIWG meeting 2**
 - A summary of previous presentation is attached
- **Today's presentation takes things back up a level**
- **The aim is to promote discussion on issues and options and to seek MDIWG ideas**

Context – General Market Model

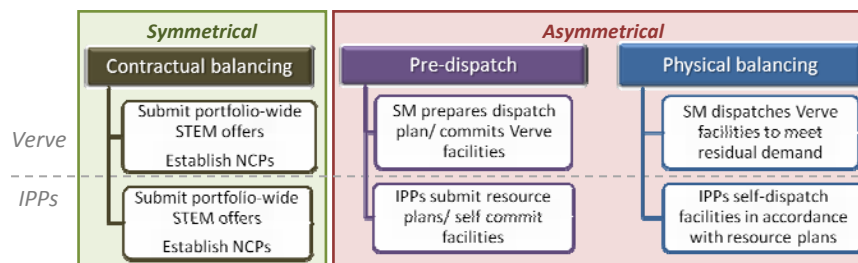


- Ideally, all participants would be able to submit balancing offers/ bids
- And be dispatched by SM in merit order

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Context – Current Paradigm



- IPPs & Verve**
- Same treatment & opportunities
 - Nominations/ contractual commitments made well in advance of dispatch
 - One shot process

- Verve**
- Obligated to perform balancing
 - Submits price curve well before IPP plans, own dispatch plan known
 - Submits guidelines to SM for committing/ dispatching facilities
 - Exposed to disconnects between pricing and dispatch outcomes
 - Arrangements largely internalised to SM/VE - lacking transparency

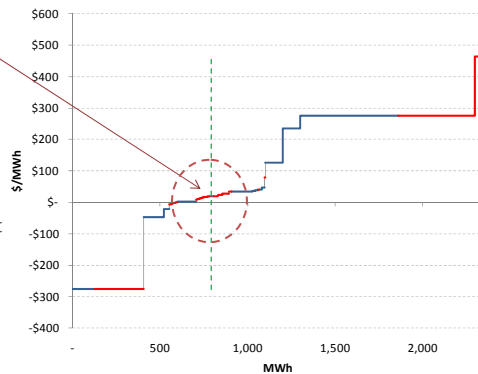
- IPPs**
- Limited balancing opportunities (avoiding VE liquids or for security)
 - Submit and self dispatch facility resource plans to meet NCPs
 - Unable to be dispatched even if next in supply (MCAP) curve
 - Exposed to balancing cost if unable to comply with Resource Plan
 - Assured of facility pay as bid price if dispatched off plan by SM

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Context - Need for Change

- **Limited opportunities for IPPs to participate in balancing**
 - e.g. STEM offers unable to be dispatched
- **Will become more difficult/ costly for Verve to perform the balancing service**
 - Increasing concerns about overnight low load/ high wind/ de-commitment issues
 - Rising gas prices in longer term
- **Verve is exposed to disconnects between pricing and dispatch outcomes**
- **Balancing could be more efficient**
- **Short and long term benefits if the market properly values & rewards flexibility**



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Approach

- **Seeking economic opportunities to participate in balancing**

Contractual Balancing

Pre-dispatch

Physical Balancing

Contract based opportunities

- Existing design symmetry
- Across full merit order
- Avoid complex dispatch systems?
- How close to real time?

Dispatch based opportunities

- Limitations of current design/ asymmetry?
- Getting IPPs into mid merit order?
- SM systems?

1 hour in UK

Balancing uncertainty

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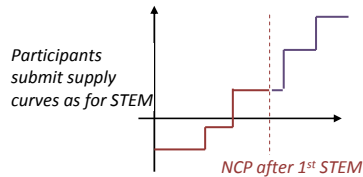
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Contract based options

STEM timing already under investigation and not considered here

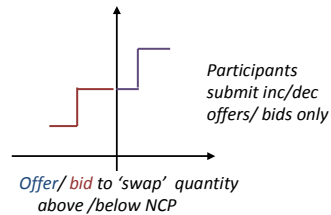
Following STEM (& balancing price forecast)

➤ 2nd STEM opportunity to further adjust positions



- \sum NCPs could change
- Timing could have scheduling/commitment implications?
- Submissions not really optional (need to manage risks of subsequent changes)

➤ Or incremental auctions to allow participants to trade matching NCP adjustments



- \sum NCPs remain same; swap balancing duty
- Offsetting swaps/ managed schedule changes
- Optional participation (maybe require default balancer to submit?)
- Swaps could be ongoing & close to real time
- Relationship to balancing price?

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Dispatch based options

➤ Facilitated basic BSCs

- Would target high value opportunities at top & bottom of merit order (high price & overnight /decommitment events)
- SM would call for BSC offers from IPPs when events expected
- Accepted BSCs would be dispatched in merit order relative to Verve facilities and able to set MCAP
- Basic BSCs would be relatively straightforward, leveraging off BSC provisions
- Harder for BSCs involving IPP decommitment/ multi-interval offers

➤ Increase IPP flexibility to adjust resource plans

- More generic approach across merit order
- IPPs could seek SM approval to deviate from Resource Plans based on MCAP forecasts
 - Security criteria easy; Verve impacts harder
- IPPs would need to accept risk of MCAP altering as a result
- Or could a more generalised BSC style regime work further into the merit order?
- Price-based dispatch by SM would be more transparent/ efficient

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Dispatch based options *(cont'd)*

- **Would it be practical for SM to dispatch IPPs that were offered into STEM and therefore in the MCAP/ supply curve?**
 - i.e. IPP offers/ bids relative to NCPs (from STEM process) are in effect inc offers/ dec bids
 - Offers/ bids would need to be tagged by facility for SM/ security purposes
 - Would it be possible for SM to dispatch offers/ bids relative to Verve's portfolio price curve?
 - And ensure consistency between dispatch and pricing outcomes
 - Or would Verve need to submit prices by facility as well?
 - Although which facilities will be required/ committed may not be known when making STEM submissions
 - How would changes in circumstances (commitment, fuel, outages etc) be managed?
 - e.g. remove affected segments from MCAP curve? Provide for re-nominations?
 - Or would it be practical/ preferable for participants to submit facility inc/dec prices relative to resource plan (or vs NCP in Verve's case) once resource plans and dispatch plans are known?
 - What SM tools/ systems for scheduling and dispatch would be required? Market systems?

Summary of MRDT notes from MIDWG Meeting 2

1) Existing BSC provisions

Rules currently provide for Verve or SM to enter BSCs with participants

- Verve could insert a BSC within the guidelines it provides SM for dispatching its facilities
- SM would need to agree with Verve how and when to dispatch a BSC, and how to recover costs

Verve should be incentivised to enter a BSC to avoid the dispatch of higher cost balancing resources (e.g. overnight unit de-commitment/ cycling)

- Presumes counterparty would also see commercial benefits

BSCs have not been deployed to date

- Suggests one or other party perceives unacceptable risks or contractual barriers in trying to negotiate and/ or execute a BSC
- Is it possible to improve incentives to negotiate BSCs? e.g.
 - Increase transparency around dispatch and balancing costs
 - Place good faith obligation on Verve (and others?) to negotiate if approached

2) Basic market facilitated BSCs

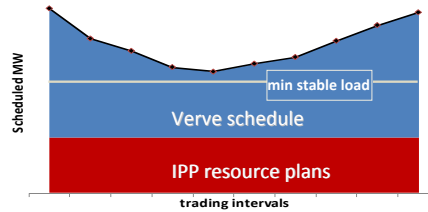
Alternatively, the market could proactively seek to facilitate BSCs at times of high value

- Indicated by very low balancing price (overnight low demand)
 - i.e. Procuring IPP alternatives to de-commitment of Verve units
- Or very high balancing price (low reserve)
 - i.e. Procuring alternatives (IPP or demand side) to Verve gas turbines
 - IPP non liquid fuelled facilities must be dispatched now on pay as bid basis ahead of Verve distillate
- Would be relatively straightforward to implement basic BSCs:
 - Leverage off existing BSC provisions in the rules where practical
 - Would ideally publish balancing price forecasts as a matter of course

2) Basic market facilitated BSCs (cont'd)

➤ Could work as follows for overnight/ low price situations:

- SM forecasts (some hours ahead of time) that a Verve unit may need to be de-committed



- SM would announce this to the market along with the relevant trading periods and expected balancing price should de-commitment be required
 - e.g. -ve \$20/MWh
- IPPs would be invited to submit BSC offers - prices above the expected balancing price indicating their preparedness to reduce output below their resource plan levels and the maximum amount
 - e.g. a reduction of up to 80 MWh at -ve \$15/MWh
- SM would rank by price and place on call the IPP(s) with the best price(s) to reduce output if required
- The accepted IPP(s) would then be available to SM to dispatch downwards if necessary to avoid de-committing the Verve unit

2) Basic market facilitated BSCs (cont'd)

- MCAP would be set at the lesser of MCAP as normally calculated or the lowest priced IPP offer that was dispatched. e.g.
 - Suppose the lowest priced IPP dispatched down by SM had submitted a price of -ve \$15/MWh
 - But MCAP as calculated normally would have been -ve \$5/MWh
 - Then MCAP would be adjusted to -ve \$15/MWh (protecting the IPP from uncertainty about *out turn* MCAP to ensure willingness to submit options to SM)
 - IPPs dispatched down would pay the *out turn* MCAP for 'authorised' deviations below resource plan levels
 - e.g. An IPP dispatched below its resource plan would pay -ve \$15/MWh
 - i.e. In effect, it would receive \$15/MWh for the MWh dispatched below resource plan

Similar mechanisms could apply in high price periods to seek BSC alternatives to Verve GTs

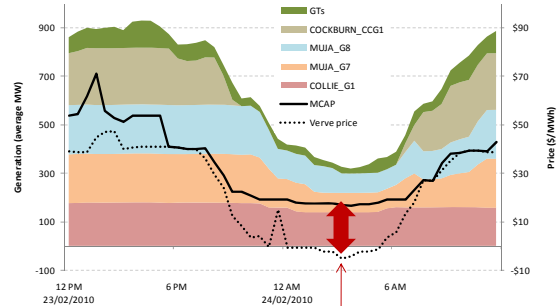
- Especially when liquid fuels likely to be used
- **Pre-requisites:**
 - Cost reflective balancing price to ensure participating generators receive appropriate payment
 - Forecast of prices

2) Basic market facilitated BSCs (cont'd)

➤ Issues:

➤ Current MCAP impediment

- Consider example of 24 Feb 2010
- Verve facilities were dispatched down overnight to minimum, or shut down, and some GT capacity in service



- MCAP was around \$20 per MWh higher than indicated by Verve's price curve
- Undervaluing opportunities for IPPs to have been dispatched downward profitably

BSCs involving IPP de-commitment or multi-period/ inter-temporal effects would be more complex

- i.e. difficult for participants to reflect multi-period risks (at least with simple offers) and for SM to evaluate offers

Discussion Points

2) Basic market facilitated BSCs

- Identification of de-commitment situations
- MCAP forecasts (routine vs de-commitment, publication)
- Form of BSC offers (e.g. No of tranches? P,Q only?)
- Selecting/ calling BSCs
- SM issues/resourcing
- Price formation – clean price, adjustments for dispatched BSCs
- Systems requirements
- Other issues?
- Overall feasibility/ effectiveness

More generic options

Other options for IPPs to more generally provide balancing were also considered by MRDT

- Seen as more complex and/or requiring more careful assessments of overall economic impacts
 - E.g. to assess the effects of increasing uncertainty in relation to Verve scheduling, unit commitment and fuel management decisions
- Although it may be practical to mitigate through other market design enhancements
 - Such as ability to re-nominate

3) Relax resource plan dispatch tolerances

This option would allow IPPs to self dispatch above or below their resource plans based on their evaluation of MCAP forecasts

- Rule changes would be relatively straightforward to implement, by changing dispatch tolerances
- Operationally though, unfettered flexibility to deviate from resource plans could have system security implications (loss of control by SM)
- And to obtain net efficiency gains, net savings would need to result from an IPP deviation, taking account of any additional costs that might be imposed on Verve as a result. e.g.
 - Unfettered IPP flexibility to deviate from resource plans would increase uncertainty about balancing requirements
 - And complicate, or invalidate, some plant scheduling, commitment and fuel management decisions

3) Relax resource plan dispatch tolerances *(cont'd)*

- Participants would need to accept the potential impact of their (and others') deviations from resource plans on the balancing price
 - E.g. their deviations could result in a higher or lower balancing price invalidating their decision to deviate
- Would enable a degree of self-balancing but may increase overall balancing requirements rather than making a contribution to balancing (i.e. may not constitute participation in balancing)
- Alternatives could include partial relaxation of dispatch tolerances or targeted relaxation at certain times
 - E.g. temporarily relaxing downward dispatch tolerances overnight to address de-commitment issues

Note that SM is already able to in effect relax dispatch tolerances in issuing an instruction to an IPP to move off resource plan for system security purposes

Pre-requisites

- Cost reflective balancing price to ensure appropriate payments to participating generators and appropriate charges to participants causing balancing requirements
- Forecast of balancing price

Discussion Points

3) Relax resource plan dispatch tolerances

- MCAP forecasts / publication
- Implications for Verve scheduling/ costs, SM/system security – mitigation?
- Net balancing impacts (participation vs cause)
- Outturn pricing risks for participants
- Systems requirements
- Other issues?
- Overall feasibility/ effectiveness

4) Seek authorised deviations

Providing for IPPs to seek authorisation from SM to deviate from resource plans could mitigate system security concerns about unfettered deviations

- Criteria could be developed for SM to apply in considering requests for deviate from resource plans
- And for assessing multiple deviation requests (made at or for the same time, or different times over multiple and/or overlapping intervals) , etc
- Short of the ability for Verve to re-nominate, it could be difficult to avoid net adverse economic impacts
 - Perhaps provide for SM to authorise deviations which would not lead to material impacts on Verve schedules/ costs?
 - i.e. in its capacity as scheduler and dispatcher of Verve's portfolio
 - Would require judgements, potentially over the scheduling horizon, and without information about IPP costs it would be impractical to make an overall assessment of potential benefits / costs of authorising deviations

4) Seek authorised deviations (cont'd)

- A targeted regime (for example, overnight de-commitment issues) might be workable although similar in effect to the market facilitated BSC concept
- Again, IPPs would also need to accept the risk of adverse pricing impacts as a result of their deviations from resource plans
 - Markets usually address these, and other economic efficiency risks, by providing for generators to submit prices at which they are prepared to be dispatched relative to others (considered next)
- Again, while enabling self-balancing, would probably increase overall balancing requirements rather than making a contribution to balancing support
 - Except in targeted situations such as overnight de-commitment
 - Or if SM could establish that authorising a deviation would reduce overall balancing requirements in the relevant trading intervals and not have adverse economic impacts on scheduling the balancer

Discussion Points

4) Seek authorised deviations

- SM authorisation criteria, multiple/ overlapping requests etc
- Generic vs targeted?
- How to ensure net economic gains/ participation in balancing rather than causing
- Outturn pricing risks for participants
- SM issues/resourcing
- Systems requirements
- Other issues?
- Overall feasibility/ effectiveness

5) Submit incr/ decr prices relative to MCAP

Could IPPs submit offers/ bids indicating preparedness to be dispatched above/ below their resource plan level relative to MCAP?

- i.e. rather than just when requested by SM for specific purposes such as an overnight de-commitment situations
- These offers and bids would ideally be:
 - Formed from STEM offers/ bids relative to participant NCPs consistent with the formation of the MCAP price curve (although inability to re-nomination may
 - By facility, as for resource plans, to enable SM to assess security implications
- In principle, offers/ bids would:
 - Provide a basis for SM to dispatch IPPs relative to the MCAP price curve
 - Be eligible to set the balancing price to ensure appropriate compensation and incentives to participate
- In addition to market system requirements, key aspects that would need to be considered include:
 - SM's ability to dispatch IPPs in this manner (i.e. relative to the MCAP portfolio price curve and Verve dispatch guidelines or portfolio price curve)

5) Submit prices relative to MCAP (*cont'd*)

- Potential efficiency impacts on the scheduling and dispatch of Verve resources given inability to resubmit day-ahead offer curves
 - i.e. while SM could (and does) reschedule Verve facilities to account for the dispatch of IPPs off their resource plans, this would increase uncertainty for Verve in resubmitting its day ahead price curve
- Other options may mitigate some of these concerns (e.g. ability to re-nominate) or be better alternatives (e.g. contractual/ pre-dispatch options discussed later)

Pre-requisites

- SM tools to enable price based dispatch of IPPs relative to Verve
- Cost reflective balancing price to ensure appropriate payments to participating generators and appropriate charges to participants causing balancing requirements
- Forecast of balancing price
- (Probably) changes to STEM operation to ensure resultant operational requirements are physically and financially realistic
 - e.g. could consider changing tight link between NCP and resource plans

Discussion Points

5) *Submit incr/ decr prices relative to MCAP*

- Price forecasts/publication
- Facility or portfolio offers?
- Role of STEM offers
- Dispatching offers relative to Verve facilities (dispatch guidelines, portfolio price curve etc)
- Verve scheduling implications without renominations
- Price formation
- SM tools/ systems
- Market systems
- Other issues?
- Overall feasibility/ effectiveness

6) Multiple STEM runs

A second (or more) STEM runs would provide an opportunity to respond to MCAP forecasts, from earlier runs, and participate in pre-dispatch balancing

- In effect, a contractual alternative, in pre-dispatch timeframes, to physical balancing
- Could avoid or mitigate some of the potential concerns about physical balancing options and may reduce physical on the day balancing
- The possibility of adopting a 2 or 3 pass STEM nominations process was considered
- i.e. to enable participants to modify and resubmit their positions
 - e.g. initial nominations/STEM (as now) plus one or two subsequent re-nomination/STEM processes later in the day (probably with a similar end time as the late gate closure option outline above)
- To support subsequent nominations, following the initial STEM run, each participant would receive for each trading interval to the end of the next trading day:
 - Their NCP
 - Overall system balancing requirements; and
 - MCAP forecasts

6) Multiple STEM runs (cont'd)

- Would need to be decided whether initial nominations should be binding or indicative
- If binding, then participants would have firm NCPs (bilateral +/- STEM) following the initial STEM run
 - Subsequent submissions would then result in incremental changes (if any) to NCPs based on any off-market adjustments to previous bilateral positions and/ or any cleared STEM bids or offers
 - A possible argument for initial submissions not to be binding is that they would be made absent any pre-dispatch forecasts
- Alternatively, if initial and revised submissions are indicative only, firm NCPs would only be established from final submissions and the STEM process
 - Possible arguments for all submissions being binding include potential incentives to make accurate and cost reflective submissions; and/ or
 - A participant being able to elect to participate only in the initial (or revised submission) stage
 - e.g. a participant could trade-off any transaction costs against perceived benefits of participating in revised and final submissions, in effect making a standing initial submission

6) Multiple STEM runs *(cont'd)*

- Further, pre-dispatch forecasts would be less meaningful if not all submissions were included
- So, under either approach, there would need to be a requirement to make initial submissions and thereafter to update submissions if there are any off-market changes to bilateral positions

Related issues:

- Operation of STEM would need to be amended to ensure resultant operating profiles are both physically and financially realistic
- Could also consider breaking tight link between NCP and resource plans

Discussion Points

6) Multiple STEM runs

- Forecasts (NCP, price etc)/ publication
- Systems/ resourcing requirements
- Binding or indicative submissions
- Contractual balancing vs physical balancing
- SM requirements/ timelines/ gate closure
- Other issues?
- Overall feasibility/ effectiveness

7) BS auctions or swaps

Could consider incremental STEM style process(es) following the initial STEM

- i.e. a contractual/ pre-dispatch alternative to submitting offers/ bids for dispatch relative to MCAP
- IPPs would submit increase and decrease bids relative to initial STEM outcomes (NCP/resource plans) in response to MCAP price forecasts
- This would have the benefits of:
 - Enabling both Verve and IPPs to incrementally adjust positions, giving offsetting adjustments to original NCPs/ pre-dispatch schedules
 - Assuming original schedules were feasible, so should revised schedules (given offsetting adjustments)
 - Subject to SM approval regarding system security requirements
 - SM would not require additional systems for dispatch purposes
- Compared to dispatch based options, there would be less opportunity for IPPs to respond to MCAP closer to real time
 - Although could consider an open swap system for participants to make or hit an offer or bid at any time prior to an agreed gate closure

Discussion Points

7) BS auctions or swaps

- Incremental vs full STEM approach
- Offer/ hit any time vs STEM style at pre-set times
- System requirements
- Contractual balancing vs physical balancing
- SM requirements/ timelines/ gate closure
- Other issues?
- Overall feasibility/ effectiveness

Some notes on Price Forecasts

- Balancing price forecasts could be published when Verve schedules prepared
- Intersection of Verve balancing cost curve (ex STEM) and scheduled quantity
- Indicate nominal price forecast with +/- uncertainties (e.g. hi/lo demand)
- SM receives resource plans around 1:30 pm and prepares Verve schedule
- Schedule = demand forecast less wind forecast less resource plans (loss adjusted and taking account of any system constraints)
- Schedule horizon to end of next trading day
- SM could prepare schedule mid morning (after STEM process) if participants supplying own load would provide gross generation (currently only available when resource plans submitted)
- Balancing price forecasts could be published when SM prepares/revises Verve schedule:
 - After 10:30 am following STEM; noon (BOM forecast); around 2pm (if changes due to resource plans); new BOM forecasts (4pm, 7pm, 7am); material changes (e.g. IPP outages)