

# **SWIS Balancing Arrangements – Issues and Options**

**Presentation to MAC**

**14 July 2009**



# Introduction

- **Brief:**

- Asked to consider competitive balancing market issues and options
  - within current regulatory arrangements (e.g. capacity based market design)
  - whilst ensuring security requirements are able to be managed

- **Today's purpose:**

- Test observations and ideas with participants and seek feedback

# Some observations – market arrangements

- **Capacity + srmc paradigm**

- Origins in investment market/ Verve dominance?
- Most electricity is traded bilaterally
- Ability to adjust position in STEM and/ or rely on balancing market

- **Balancing arrangements:**

	Verve	Scheduled IPPs	Unscheduled
Support	Underwrites	Limited	No
Rely on	Yes	Yes	Yes
Payments	Balancing Qty @ MCAP	Balancing Qty @ pay-as-bid	All Qty @ MCAP

- **Because balancing dispatch order is internalised and IPPs generally manage own commitments:**

- Arrangements can be simpler than in competitive energy markets
- *Merit order* dispatch - blind to prices; economic dispatch & pricing model not needed
- Less dispatch rigour than in competitive spot markets => greater SM flexibility; less stringent market systems

- **Implications for opening up balancing arrangements?**

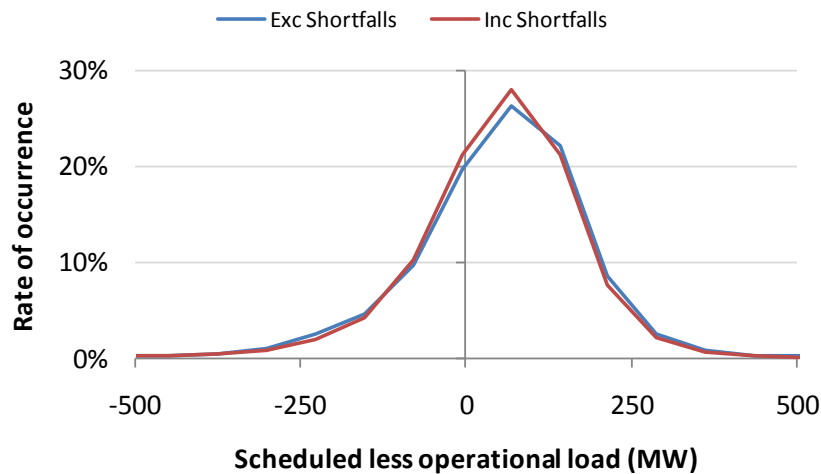
- e.g. how to form a balancing merit order? by facility? MCAP formation?
- Greater transparency would be sought by participants

# Some observations – balancing demand

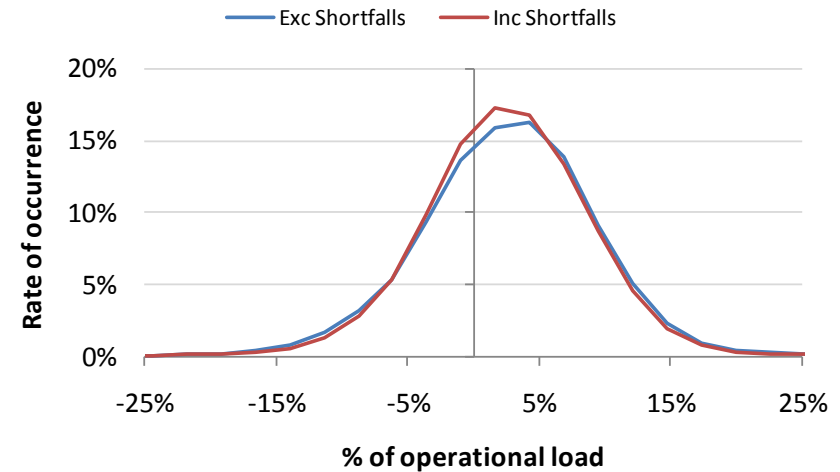
- **Actual load vs scheduled load provides some insights**

- *Scheduled load  $\approx \Sigma$  loss adjusted NCPs*

↓ **Scheduled vs actual load statistics (Sep 2006 - Mar 2009)**



↓ **Re-expressed as percentage of system load at the time**



- **Demand for balancing service is significant**

- Unscheduled generation? Likely to grow?
- Demand uncertainty?
- Outages/ fuel constraints?

# Some observations – context for competitive balancing?

- IPP facilities would compete with Verve's facilities @ srmc
- To the extent IPPs could compete, overall balancing costs (exposures) should reduce
- Overall objective? *Reduce balancing costs/ use resources effectively/ support efficient investment?*

## ➤ Need to explore/ understand motivations wrt balancing e.g.



- Managing electricity & fuel positions given STEM timeframes?
- Concern over transparency/ balancing price formation etc?
- IPP flexibility/ desire to participate in balancing per se?

## ➤ Answers could influence development strategy and options to consider. e.g.



- Balancing support contracts
- Conditionally increase resource plan tolerances for pre-certified IPPs
- Shorten STEM timeframes/ reduce balancing role
- Provide opportunities to adjust STEM commitments
- Open up balancing to all participants
- Variants and combinations of the above

## • Any option(s) will require investigation/ resolution of practical issues

- Need to be cognisant of time & effort vs benefits (and risks of solving wrong problem)!

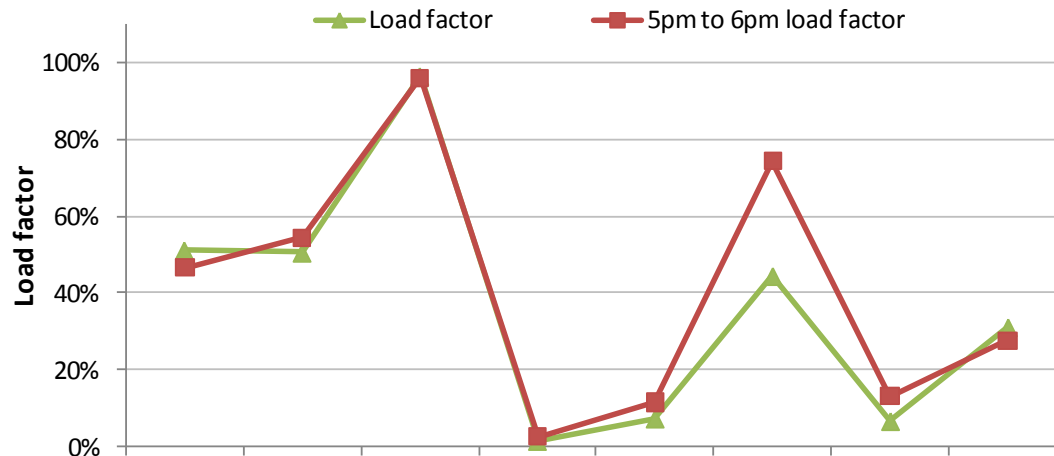
# Alternatives to Verve balancing resources

- Difficult to assess extent to which IPP facilities could currently compete with Verve for balancing

- **Relevant factors include:**

- Plant specific factors (e.g. fuel supply, commitment times etc)
- Available operating ranges (e.g. technical min-max MW; commercial positions) and plant flexibility
- Marginal cost of IPPs relative to Verve resources and MCAP levels

↓ Load factors for controllable IPP facilities during February 2009

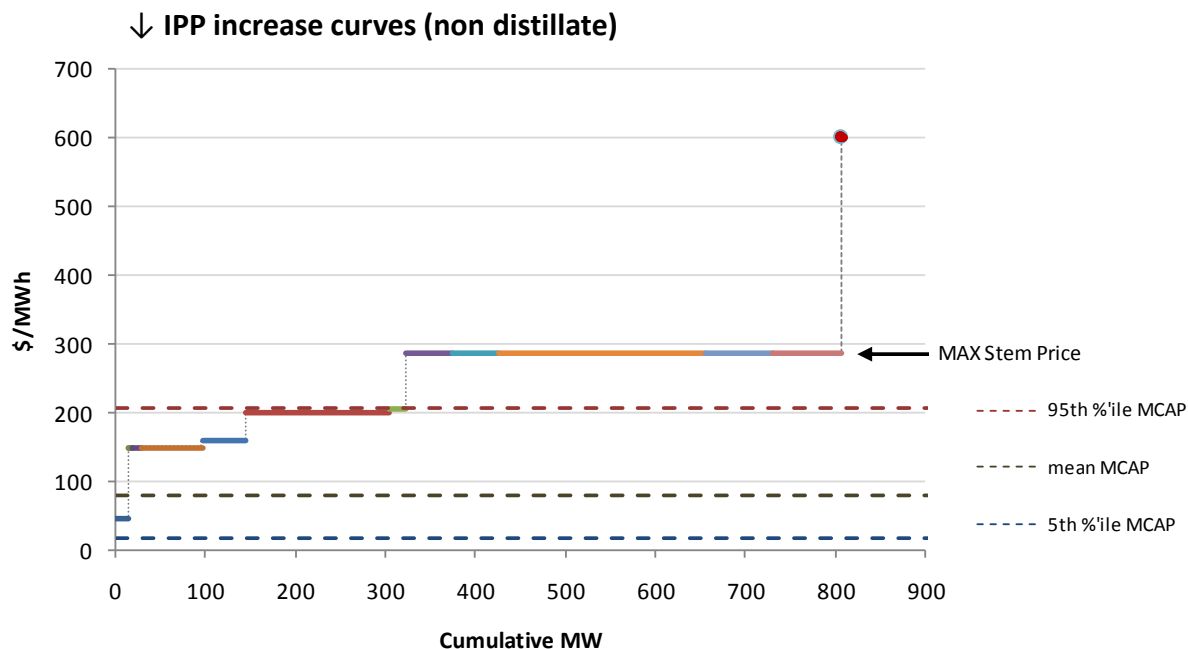


- Unused IPP capacity was available (≈ 500 MW during peak demand periods)

# Alternatives to Verve balancing resources *cont'd*

- **Historical MCAP levels vs IPP supply increase price curves for controllable non-distillate facilities**

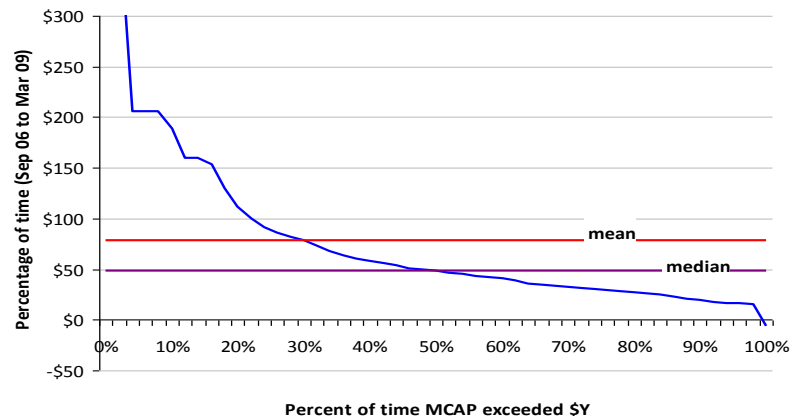
- Derived from IPP standing balancing data
- Facility minimum dispatchable MW to nameplate MW levels



- If balancing data prices reflect *srmc*, IPPs would generally find balancing unprofitable at MCAP prices
- Balancing data prices are generally at Max or Min STEM price limits so probably not reflective of *srmc*?

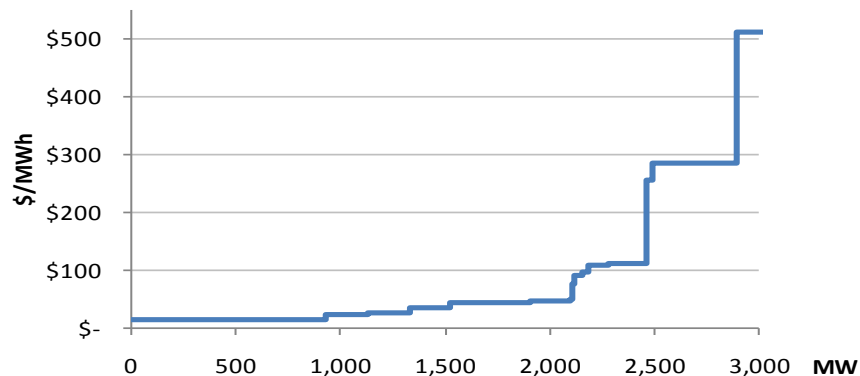
# Alternatives to Verve balancing resources *cont'd*

## ↓ MCAP statistics - September 2006 to March 2009



- Mean MCAP  $\approx$  \$78/MWh & median MCAP just under \$50/ MWh
- MCAP at times reached high levels, and occasionally very high levels (off chart)
- IPPs relying on balancing have exposure to these prices – or could profitably contribute to balancing (and reduce exposures)?

## ↓ Verve's STEM supply curve (5pm 4 February 2009)



- Rules specify srmc based submissions
- Implies >2,000 MW of Verve capacity below median MCAP level
- But significant capacity above median & mean STEM levels



# An ideal balancing regime?

- **In an ideal world, assuming the current overall market design (capacity/ STEM/ srmc balancing):**
  - Commitment timeframes would be less (minimising balancing/ allowing participants to better manage positions)
  - All participants could elect to compete with Verve's facilities for balancing
  - System balancing prices would reflect the price of the actual marginal facility
  - Those causing deviations would pay actual balancing costs
  - *Assets & resources would be used efficiently and the cost of balancing support would be minimised*

# An ideal balancing regime?

- **But such an ideal ignores market size/ transaction costs... and would involve significant changes:**

1. Verve would also submit resource plans, by facility
2. Participants (in the balancing market, inc Verve) would submit facility based balancing offers to the IMO
3. IMO would prepare a unified dispatch merit order (Verve & IPP balancing services)
  - Linked to facilities - currently STEM offers are portfolio based
  - Otherwise, how would SM dispatch competing balancing resources consistently, relative to each other?
4. SM would dispatch balancing services above/ below plans in accordance with unified merit order
5. Balancing prices would be set at the price of the marginal balancer
  - Rather than from ex ante portfolio curves submitted 1 to 2 days before dispatch
  - Would still need SM discretion/ flexibility and associated constrained on/ off balancing payments

- **Given practical issues/ likely effort, it is worth exploring :**

- Simpler options consistent with long term efficiency objectives?
- Transitional steps that can be taken?

# BS contracts?

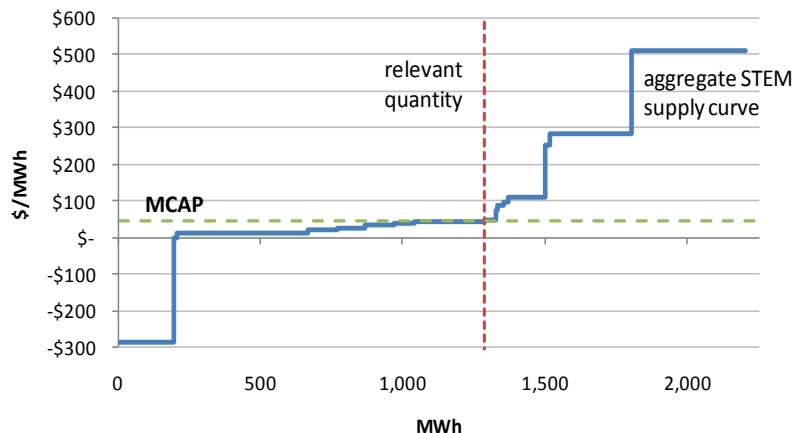
- Rules provide for SM and Verve to enter contracts with IPPs for the provision of balancing support services
  - “...one that allows SM to call upon the participant facilities to assist SM and Verve in meeting their dispatch obligations” - may be arguable as to what that means?
- Assuming Verve and SM support, a number of issues would need to be worked through. For example:
  - Would require support of both Verve and SM support to develop
  - On what basis would SM dispatch a BS contract relative to Verve resources?
    - Verve currently supplies a dispatch merit order to SM (not costs or prices)
    - Without relative costs/ prices, how would SM include BS contracts within the dispatch merit order?
    - Verve could submit STEM offers to IMO on a facility basis (currently portfolio basis) or provide facility srmcs
    - IMO could provide SM a balancing dispatch merit order (to rank Verve facilities & balancing support contracts)
  - How should BS contracts be accounted for in MCAP formation?
  - Likely to involve rule changes to be effective? Multiple BS contracts?

# Conditional relaxation of resource plan deviation tolerances?

- **Controlled expansion of dispatch tolerance for “pre-certified balancing capable” IPPs?**
  - In principle, would enable IPPs to contribute to balancing at MCAP prices
- **Uncontrolled IPP deviations above & below resource plans could be problematic:**
  - For other participants in managing NCPs
  - For SM (uncontrolled/ unplanned deviations could hinder balancing the system/ pose security risks)
  - For dispatch and pricing efficiency
    - e.g. were an IPP were to displace lower cost resource or MCAP clear below IPP balancing cost
- **In some respects, unscheduled generation poses similar risks (and spills into balancing market at MCAP)**
- **But *schedulable* generation can be “planned” in advance of dispatch**
  - And, if necessary, SM can exercise discretion to dispatch/ not dispatch for security reasons
  - This, & greater transparency about market conditions and likely MCAP, could mitigate risks somewhat

# Conditional relaxation of resource plan deviation tolerances?

- Could ex ante supply curve & relevant quantity (or MCAP) estimates be available to participants?



- Would that enable certified IPPs to:

- Anticipate likely MCAP levels?
- Advise, subject to SM requirements, deviations from resource plans (within pre-agreed limits) in advance of real time

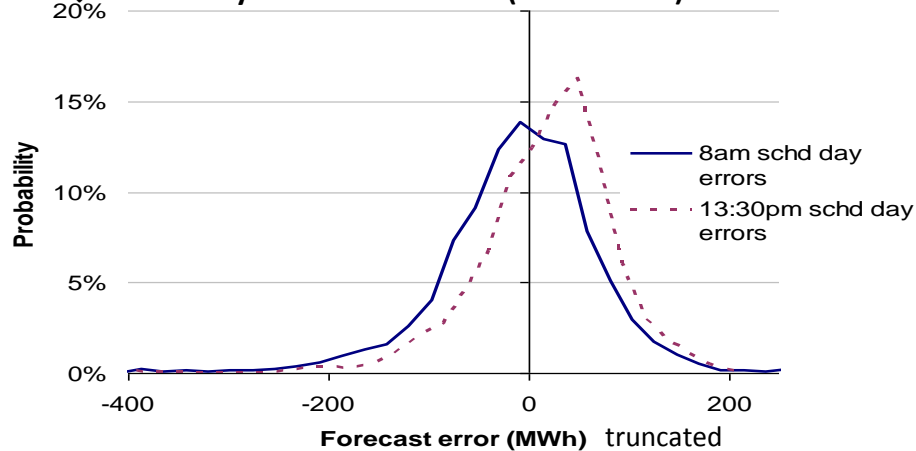
- Less than ideal but in a controlled manner might provide a step towards a competitive balancing market?

- Participants may face pricing risk (markets normally dispatch on price to avoid such risk)

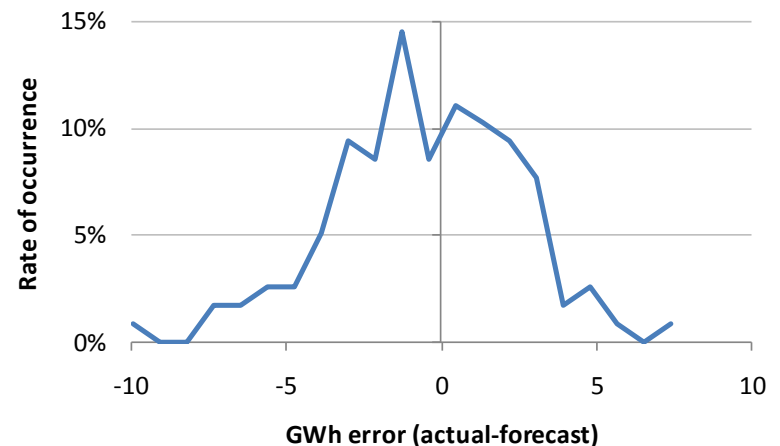
# Reduce STEM timeframes/ balancing requirements?

- **Participants make commitment decisions approximately 24 to 48 hours ahead of actual dispatch**
  - Significant changes in supply and demand conditions (and MCP) can occur over that timeframe
    - Forced outages, fuel supply constraints, variations in demand & unscheduled supply etc
  - Someone (retailers and/ or generators) ultimately bears demand uncertainty / balancing costs....

↓ Half hourly error distributions (act-forecast)



↓ In daily energy terms



- **Do current commitment timeframes reflect business hours rather than participant needs?**
  - Could reducing commitment times have similar effect (or initially be preferable?) to opening up balancing per se?

# Reduce STEM timeframes – reduce balancing requirements

- **Verve indicated some concerns about long commitment timeframes/ uncertainty/ flexibility**
  - e.g. distillate burn to manage gas position later in the day
    - In such circumstances, the real cost of balancing is high - with opportunities for alternative lower cost resources to come into play (unless subject to same gas constraints?)
- **IPPs are also likely to be concerned about making commitment decisions so far ahead of real time**
  - Newgen indicated previous day's gas use/ current position not known when it makes STEM submissions
  - IPPs without portfolio benefits find commitment lead times difficult if outages and/ or fuel constraints occur
- **Could/ should STEM timeline be shortened?**
  - e.g. submissions and auction late in the day or early next day
  - Same process – but would benefits exceed extra transactions costs (why is trading day 8am to 8am?)
- **Alternatively, could consider introducing a secondary STEM process (rolling or at set times)**

# Secondary STEM process?

- **Could consider introducing a secondary STEM process**
  - e.g. leave current process intact and/ or shorten timeframe (low cost means of adjusting positions)
- **Provide further opportunity to adjust bilateral positions through secondary STEM process**
  - e.g. at fixed time each day or rolling gate closure (e.g. 4 or 8 hours ahead of dispatch)
- **Could be a more formal way of increasing flexibility/ relaxing resource plan tolerance?**
  - i.e. formalised basis for resource plan changes closer to real time
- **Could increase IPP involvement in balancing/ reduce Verve role**
- **But not directly introduce competitive disciplines and transparency into balancing market**
- **That would require efforts to be focused on opening up the balancing regime itself**
  - Along the lines discussed earlier

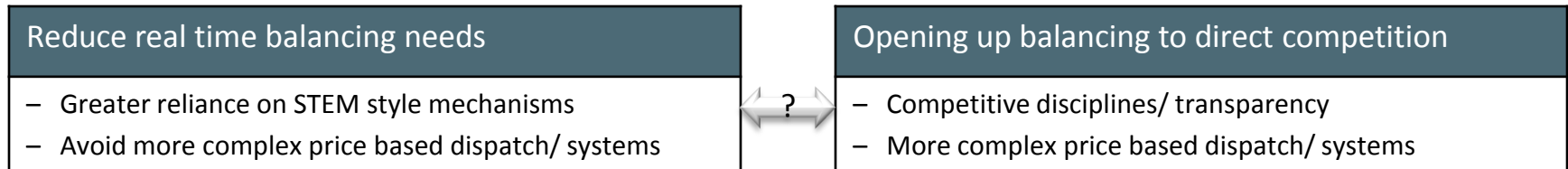


# Opening up balancing market....

- **In theory, a fully competitive balancing market with rolling gate closure could be sufficient support for bilateral regime**
  - e.g. UK market = Bilateral regime + balancing ( with no STEM process)
    - Rolling 1 hour gate closure
    - Participants declare availability to National Grid in advance
    - NG enters warming contracts with plants with start times > 1 hour
      - So they can offer into balancing and be ready if dispatched
- **Relying on such a balancing market would probably be excessive in SWIS context**
  - Increased transaction costs
  - STEM has low transaction costs, intended to counter market concentration?
- **Ultimately, focussing on an open balancing market probably gets closest to ideal arrangements**
  - But may be significant effort/ changes to move to full price based dispatch merit order

# Conclusions

- **No insurmountable technical impediments to increasing IPP participation in balancing arrangements**
  - But how much effort it is worth expending...and where to focus efforts
- **A number of options could be considered but generally within two themes:**



- **Participants should be consulted to determine interests/ preferences with regard to shortening up commitment timeframes and/ or opening up balancing market arrangements to IPPs**
  - Verve has expressed an interest in shorter timeframes (or greater flexibility)
  - Informally Newgen has as well
  - Only limited informal discussion of issues rather than options has been possible though
  - The views of retailers and other generators will also be relevant
- **Subject to the above, and any alternative suggestions, straw men designs could be developed for increased STEM flexibility and opening up balancing per se**
  - Would enable assessment of feasibility and relative costs and benefits and inform preferred option(s) including transitional steps