

# I-SEM Trialing of EUPHEMIA

I-SEM EUPHEMIA Working Group  
Meeting 2  
21<sup>st</sup> May 2015



# EUPHEMIA Workshop – Agenda

- Trial Update
- Review of Trial Batch 2 Results
- Demonstration of EUPHEMIA Data Template
- Break
- Discussion of Trial Assumptions
- Discussion of Trial Scenarios
- AOB



# Trial Update



## Trial Update – Recent SEMO Activities

- Held first public workshop on EUPHEMIA Trials 20/04/15
- Progressing further contractual arrangements with APX – there will be no impact to trials by the recent APX/EPEX merger
- Finalised further data for sharing with the working group – will be disseminated following the working group meeting



## Trial Update – Process Feedback

- Feedback received from a number of working group members
- Included suggested refinements to process:
  - Materials in advance of meetings
  - Schedule for dissemination of data
- Refinements to process have been taken under advisement by SEMO – will endeavour to provide timely information
- Algorithm expert at future meetings – has been raised with APX



# Trial Update – Interactions with I-SEM/Project

- Feedback called for an extension of the trial process to incorporate the following:
  - ❑ Interaction with I-SEM modelling
  - ❑ Effects on I-SEM including IDM and BM
- Interaction with modelling work has been discussed at modelling management panel – no formal link but EUPHEMIA outputs will inform modelling work
- Effects on later market timeframes not currently in scope of work – analysis can be discussed with WG for later trials



# Review of Trial Batch 2 Results



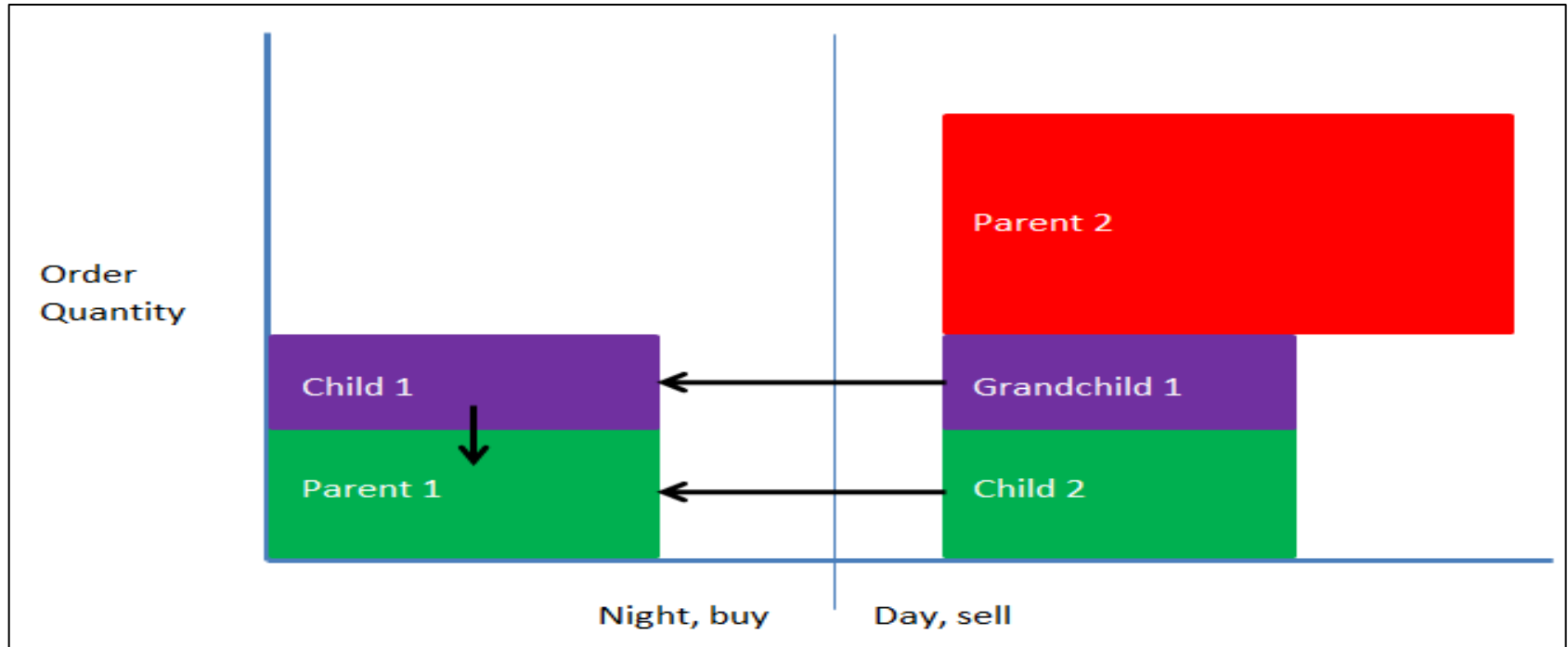
## Trial 2 – Background

- Primary objective was to investigate the effect of different pumped storage treatments (details in following slides):
  - Linked block
  - Extended linked block
  - Simple
- Energy limited hydro adapted to be simple orders instead of flexi orders to allow higher utilisation
- All order types (complex, linked block and exclusive group) were used with initial assumptions and for SEM only



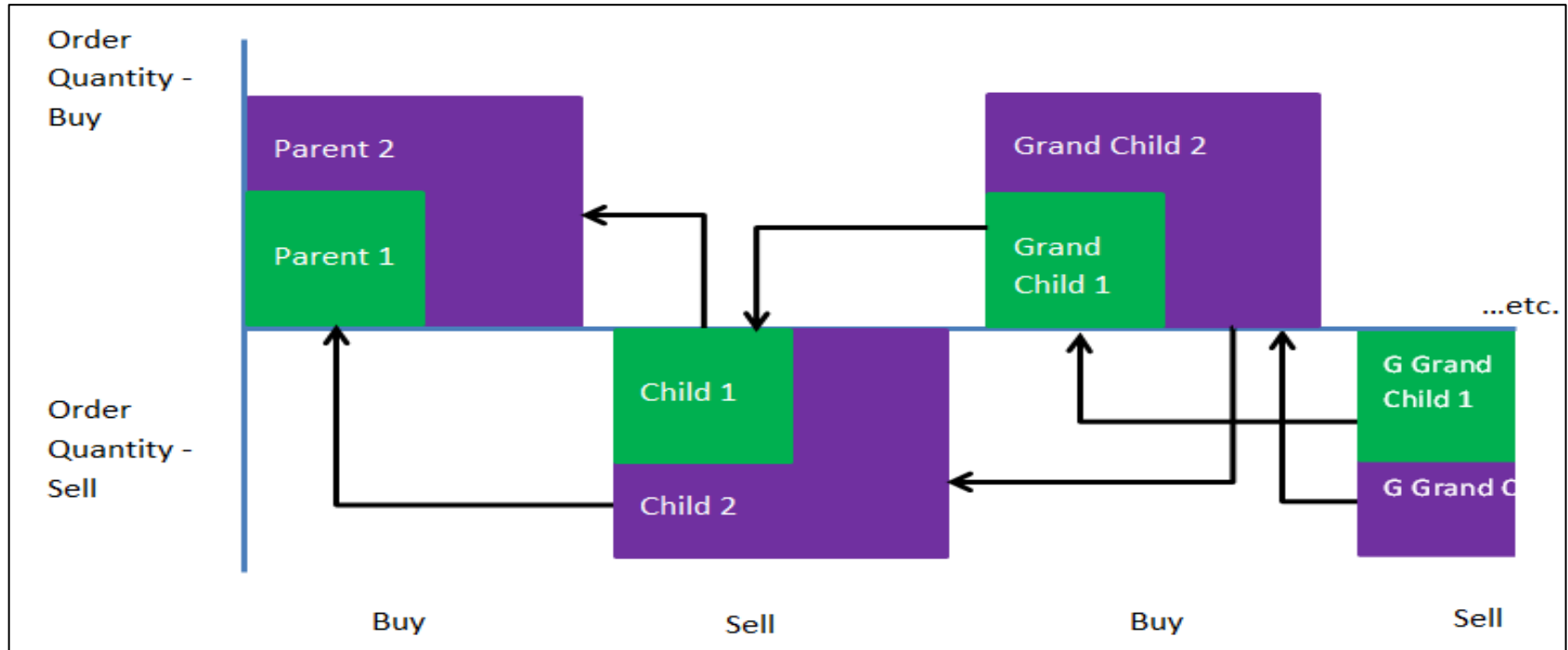


## Trial 2 – Original Linked Block Pump



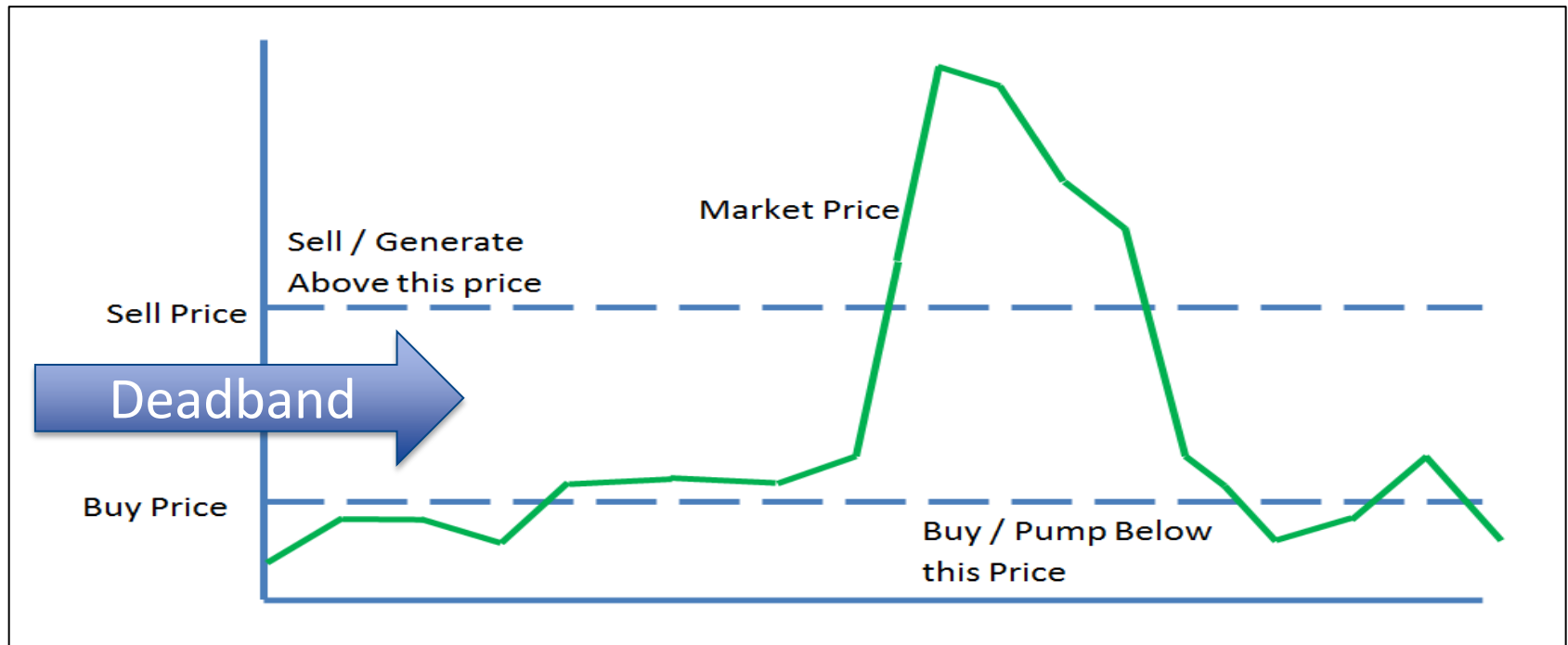
- Linked block used to respect reservoir levels
- Buy blocks at night linked to sell blocks at peak time
- Volume sold is linked to volume bought and starting volume

## Trial 2 – Extended Linked Block Pump



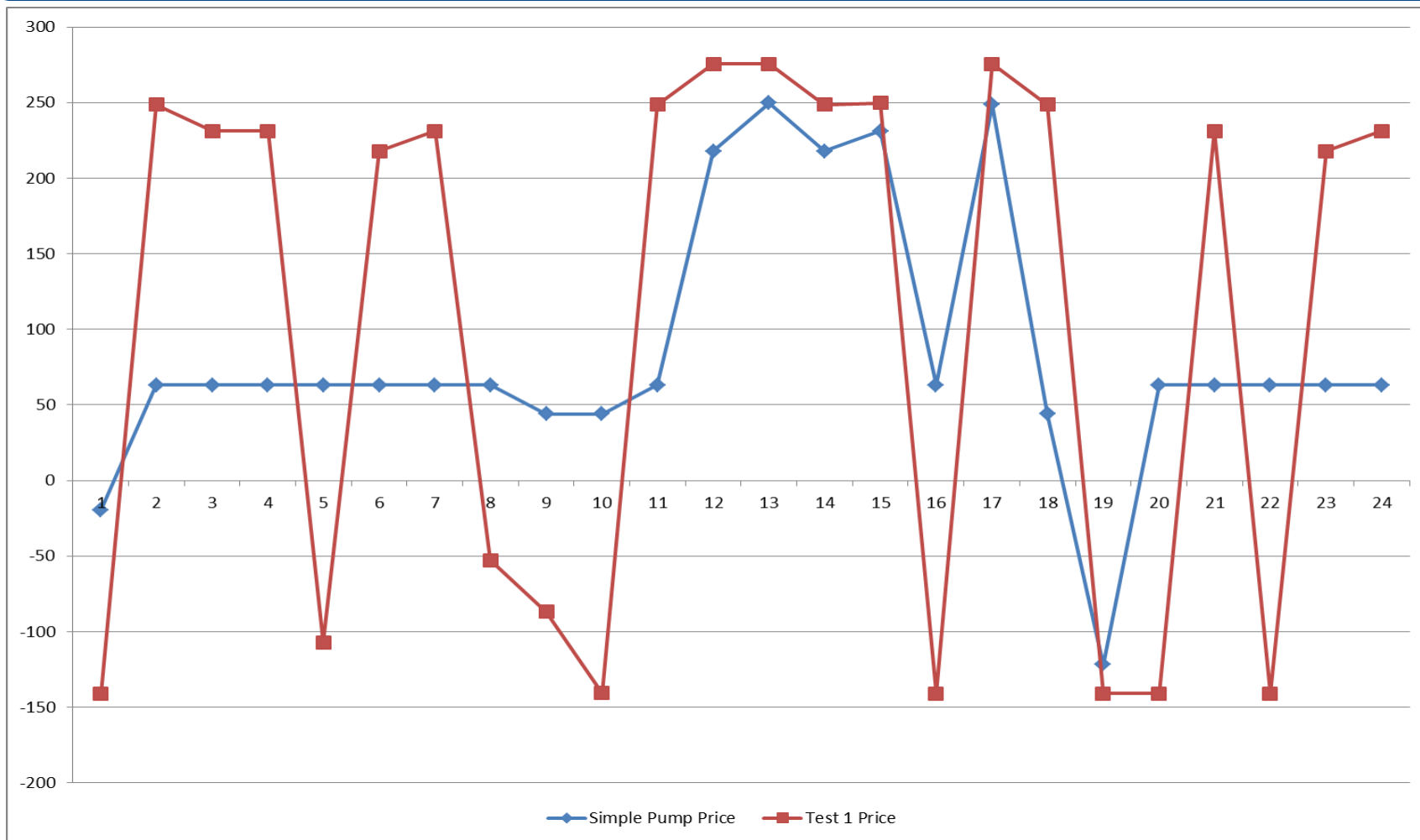
- Linked blocks extended for use throughout the day
- Multiple interlinked buy and sell orders
- Allows empty and refill – morning and evening peaks

## Trial 2 – Extended Linked Block Pump



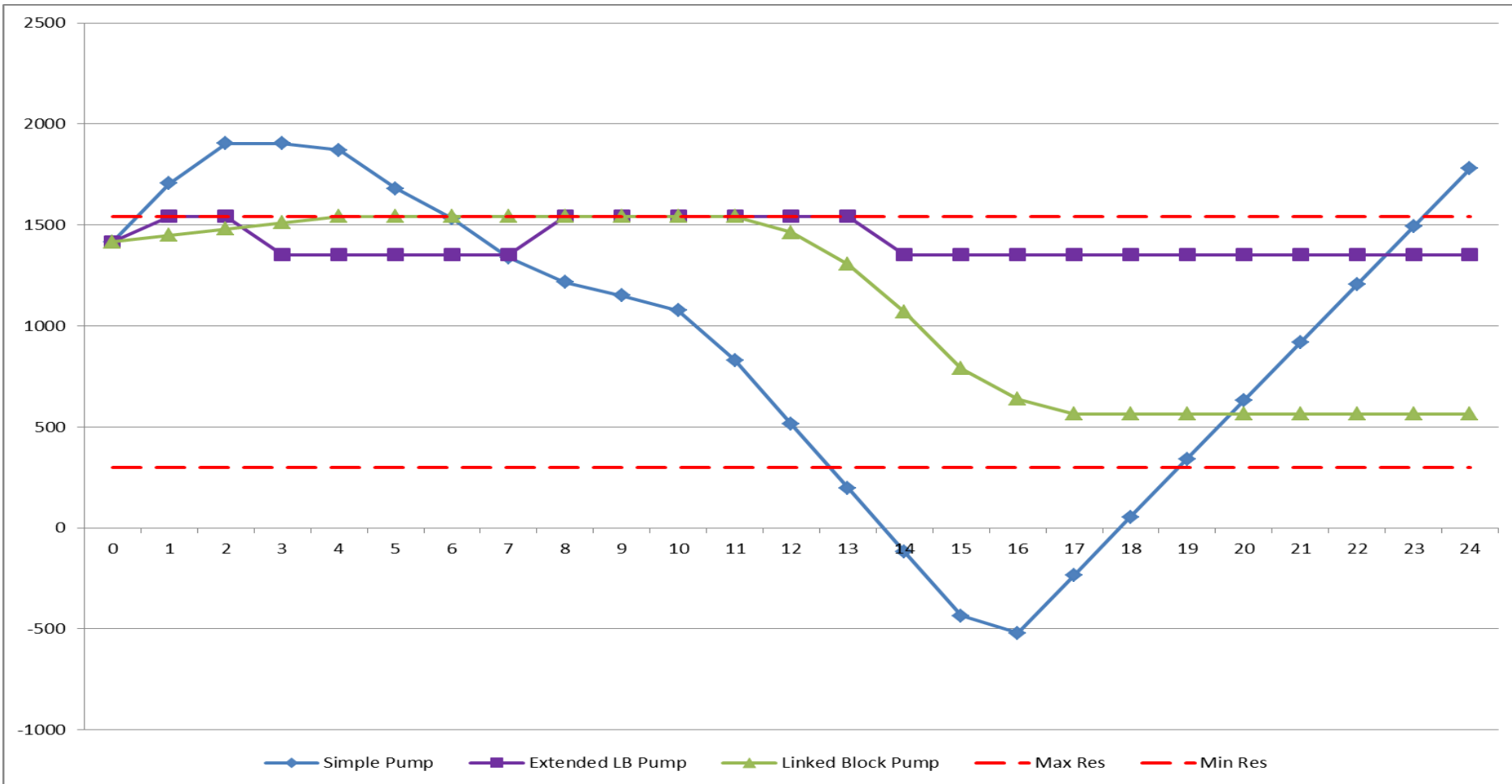
- Pump used as a price hedging instrument
- Allows maximum use of the unit
- Prices based on average price and cycle efficiency of units

## Trial 2 – Effect of Simple Pump on Price



- Price set by pump in 51/72 hours in linked blocks
- Price set by pump in 25/72 hours in exclusive groups

# Trial 2 – Reservoir Levels



- Blocks respected reservoir but were inflexible
- Simple flexible but breached reservoir constraint

## Trial 2 – Results

- No conclusive best approach to pumped storage:
  - ❑ Simple not technically feasible
  - ❑ Inconclusive on best use of linked blocks
  
- Simple pump lead to better price formation in linked block and exclusive group trials:
  - ❑ Introduced additional price makers (c. 290 MW)
  - ❑ Pump was able to set the price based on bids
  - ❑ Technically infeasible but demonstrates addition of price makers



# Demonstration of EUPHEMIA Data Template



## Worked Example 1- Linked Block

- GU\_400930
- Date 03/03/2014 – unit was ON in HOT heat state
- Profile – come on to max output, maintain that level for 4.5 hours, come off
  
- Expected Result:
  - 5 hour profile to account for ramping
  - Split into a number of stacked blocks
  - Each block has individual price





## Worked Example 2- Exclusive Group

- GU\_400930
- Date 03/03/2014 – unit was ON in HOT heat state
- Profile – come on to max output, maintain that level for 4.5 hours, come off
  
- Expected Result:
  - 5 hour profile to account for ramping
  - Single block profile to form part of an exclusive group
  - Block has a single average price

# Discussion of Trial Assumptions



# Assumptions Feedback

- Feedback received from a number of working group members
- Feedback supported initial assumptions as a kick off point
- Numerous suggestions for desired refinements to assumptions
- SEMO wish to establish a baseline set of assumptions to assess changes against – baseline to be refined
- Some revisions to assumptions to be looked at in later trials, e.g. the effect of strategic trading/ removal of BCOP



# Assumptions – Block Data

- Respondents interested in continuing to investigate blocks
- Initial assumptions lead to problems:
  - Complexity and performance issues
  - Price formation issues
- Need to revise the assumptions:
  - Minimum Acceptance Ratio and Cost Recovery
  - Level of Complexity/Flexibility/Practicality



# Assumptions – Complex and Simple Data

- Respondents were interested in continuing the investigation of complex and simple orders as well as blocks
- Do working group members have suggestions for how to refine the use of complex orders or simple orders?
- Are the assumptions made by SEMO as regards the treatment of simple orders for hydro and peaker units acceptable?



# Discussion



# Discussion of Trial Scenarios



# Scenarios Feedback

- Initial Scenarios based on mandatory DAM based on EA1
- Additional conditions discussed with EAI in February
- Feedback suggested trialling scenarios based on:
  - Additional wind (2020 levels)
  - Prices in SEM – price events etc.
  - Different times of year – winter, summer, shoulder months
- Feedback called for a mix of individual days and days in sequence





# Scenarios Feedback

- Some scenarios are outside of current scope:
  - Assessment of SNSP limit
  
- Some scenarios will need to be assessed at a later stage once EUPHEMIA is better understood:
  - Emerging technologies
  - Assetless trading
  
- SEMO are interested in engaging with the working group to assess ways that units not in the SEM may be represented for later stages of the trial process



# Scenarios Template - Example

## EUPHEMIA Trial Scenario # 1

<b>Trade Date #:</b>	<Trade date being used>	<b>Order Type #:</b>	Linked Block (Thermal) Complex (Pumped Storage)	<b>Working Group Member #:</b>	MA - SEMO
<b>Scenario Description:</b>	Trial of a "High wind" trade date with MOYLE at zero ATC and EWIC at full availability.				
<b>Objective:</b>	Assess how EUPHEMIA schedules export of supplier surplus when interconnected with Europe and only EWIC available. Assess how Pumped Storage reacts to this scenario using Complex order type in EUPHEMIA.				
<b>Assumptions/ Constraints:</b>	<ul style="list-style-type: none"> <li>1 - Pumped Storage fully available.</li> <li>2 - EWIC fully available.</li> <li>3 - MOYLE unavailable.</li> </ul>				
<b>Duration of scenario:</b>	Minimum of two trade dates trialled.				
<b>Data variables:</b>	<ul style="list-style-type: none"> <li>1 - All plant is fully available i.e no units under test.</li> <li>2 - A "High Wind" trade date should be used.</li> <li>3 - MOYLE ATC set at zero.</li> </ul>				



# Discussion



## Next Steps

- SEMO will be asking working group members to fill in scenario templates following the meeting
  - ❑ Scenarios should cover the next scenarios to be trialled
  - ❑ Larger variations to assumptions will be considered at a later stage
- SEMO will be producing an Initial Phase report covering all trials completed thus far
- SEMO will schedule the next public workshop and working group meeting



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