I-SEM Trialing of EUPHEMIA

I-SEM EUPHEMIA Working Group
Meeting 3
23rd June 2015

EUPHEMIA Workshop – Agenda

- Update by SEMO
- Trial Batch 3
- Further Analysis of Trial Batch 1 and 2
- Discussion of Confidentiality
- Scenarios Feedback
- Proposed Plan for Commercial Phase
- Next Steps

Trial Update

Trial Update – Recent Activities

- Signed contract for further services with APX
  - Contract will cover the remainder of the agreed trials
  - Requires a time limit on data – PCR data > 3 months old (rolling)
  - Allows for expert attendance of WG meeting, if desired
- Completed all additional Initial Phase trial dates agreed with industry representatives
- Updates to EUPHEMIA algorithm complete by PCR:
  - Flow based go-live/new version release

Trial Update – Recent Activities

- Published a EUPHEMIA section on the SEMO website:
  - http://www.sem-o.com/MarketDevelopment/Pages/EUPHEMIA.aspx

- For more information, contact euphemia@sem-o.com

Further Analysis

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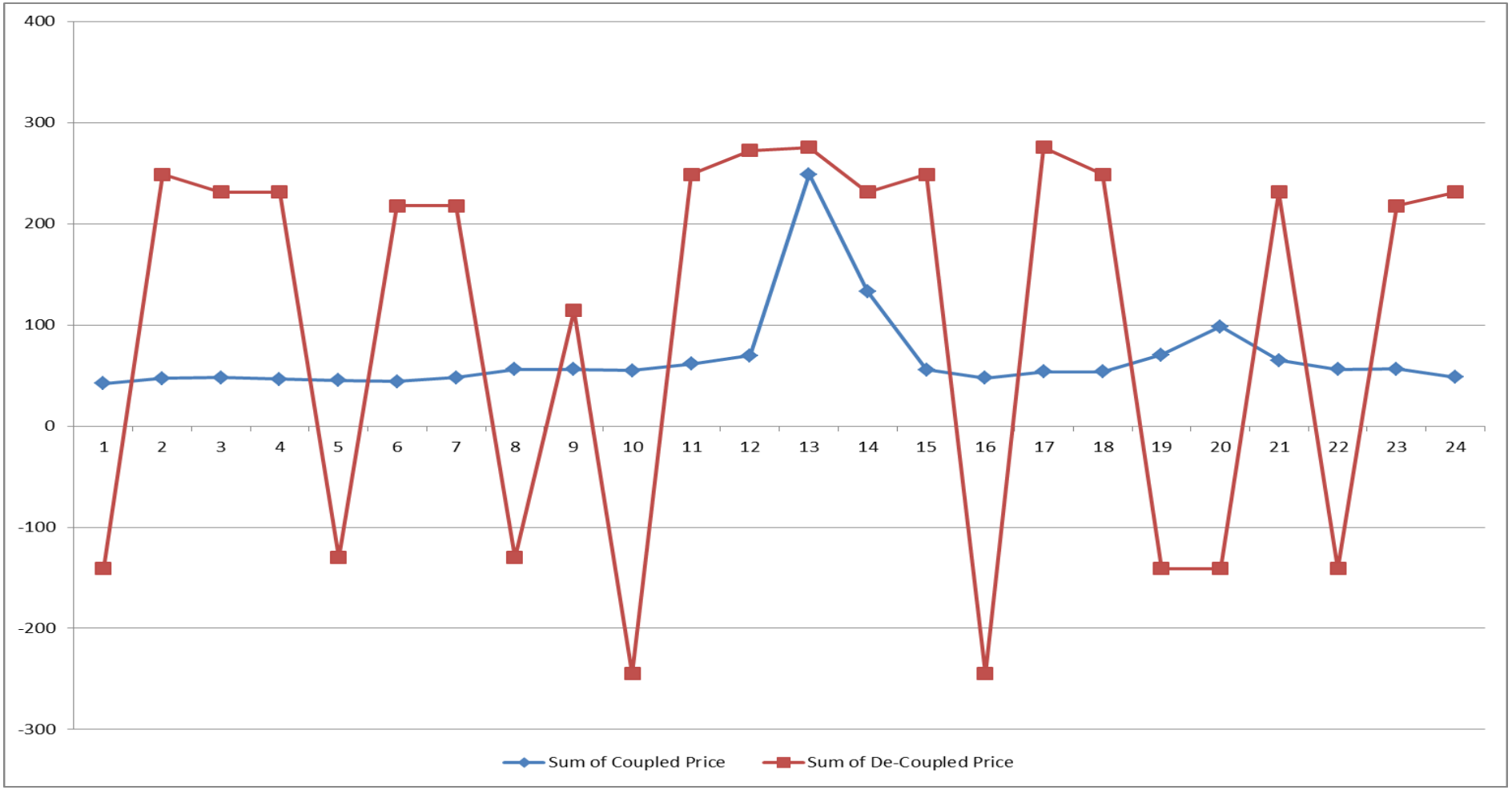
- Following prior WG meetings additional analysis has been performed on existing data

- Areas of investigation were:
  - Coupled Linked Block Datasets
  - Investigation of SNSP
  - Schedule Results Analysis

Further Analysis - Coupled Linked Block Data

- Original linked block data was SEM only
- Primary issue was a lack or price makers in the solution
- Coupling would allow price makers from other bidding zones to set the price in I-SEM
- Investigated three trading days:
  - 03/03/2014
  - 19/03/2014
  - 23/03/2014

Further Analysis - Coupled Linked Block Data



- Prices more stable and linked to load
- Average price significantly lower with same conditions

Further Analysis - Coupled Linked Block Data

- Expected effect on pricing occurred:
  - Superior pricing with interconnectors available
  - Prices can be set by price makers in other bidding zones

- Price effects only to the point of interconnector congestion:
  - Where flow is at maximum prices set in the I-SEM
  - Issues with linked blocks persist
  - Prices potentially jump rapidly

- Further work on linked block datasets is required

Further Analysis – SNSP Limit

- SNSP limit will need to be applied by the TSO:
  - Day ahead schedule may not account for SNSP limit
  - Balancing actions may be required in BM timeframe
  - Gives an indication of the level of balancing action

- Indicative analysis only:
  - Not included in the agreed scope
  - Currently available data is limited

- Can be further explored:
  - Additional Initial Phase dates, including 2020 wind levels

Further Analysis – SNSP Limit

- Original 3 dates had a breach in 5 of 72 hours

Date	Trading Period	Wind	Load	Wind %	SNSP Limit	Re-dispatch MW
19/03/2014	20/03/2014 01:00	1614.9	3203.6	50.41%	1601.8	13.1
19/03/2014	20/03/2014 02:00	1624	3026.9	53.65%	1513.45	110.55
19/03/2014	20/03/2014 03:00	1624.6	2947.9	55.11%	1473.95	150.65
19/03/2014	20/03/2014 04:00	1610.8	2947.9	54.64%	1473.95	136.85
19/03/2014	20/03/2014 05:00	1579.6	2996.9	52.71%	1498.45	81.15
23/03/2014	24/03/2014 05:00	1485.3	2897.7	51.26%	1448.85	36.45

- All load and wind entered as price taker in these runs

Further Analysis – Complex Schedule Feasibility

- Concerns around feasibility of complex schedules:
  - Fewer conditions applicable than in the SEM
  - Harder to represent technical characteristics
- Risk for generators:
  - Potential intra-day actions
  - Potential balancing actions
- Analysis to quantify the risk:
  - How often do such actions occur in the datasets

Further Analysis – Minimum Stable Generation

- Primarily looked at minimum stable generation:
  - Analysed test 1 and 2 for complex data
  - Analysed all complex sets (all pump storage treatments)

- A number of cases took place across trading days:
  - 35 cases in test 1 (0.96%)
  - 85 cases in test 2 (0.38%)

- Volume of difference from min stable gen varies:
  - Max c. 250 MW; Min c. 0.3 MW

Further Analysis – Complex Schedule Feasibility

- SEMO is willing to engage with industry on these issues:
  - Further analysis
  - Discussion/trial of possible solutions

- Scope of trialling work is set:
  - Assessment of practicalities not fundamentals
  - Existing EUPHEMIA product offerings
  - No scope to explore change requests
  - Provide improved understanding to parties of EUPHEMIA workings

Trial Batch 3

Trial Batch 3 – Selection of Trial Dates

- Plan agreed with industry representatives in February:
  - Prior to the formation of the industry working group
  - Co-ordinated by EAI
  - Limited to c. 30 days of trialling

- Covers a range of conditions:
  - Different times of year (summer, winter, spring, autumn)
  - Different days of the week (weekends, week days)
  - Different wind and load profiles (high/low/average wind/load)

Trial Batch 3 – Baseline Assumptions Used

Unit Type	Assumption
Thermal Non-Peaker	Complex
Pump	Linked Block
Hydro	Simple
Peaker	Simple
Interconnector	Trading Day ATC
Supplier	Price Taker
Wind	Price Taker

- Alternate conditions based on:
  - 2020 wind levels
  - Constrained interconnector and/or pump outage

Trial Batch 3 – Complex Dates

DELIVERY_DA	Set	Seasor	Load	Wind	Conditions	Order Book Form
07/03/2014	a	Spring	High Demand	High Wind	Normal	Complex
07/03/2014	b	Spring	High Demand	High Wind	2020 Wind	Complex
07/03/2014	c	Spring	High Demand	High Wind	2020 Wind - Constrained I/C & No Pump	Complex
19/04/2014	a	Spring	Average Demand	Low Wind	Normal	Complex
08/05/2014	a	Summer	Average Demand	Average Wind	Normal	Complex
20/07/2014	a	Summer	Low Demand	Low Wind	Normal	Complex
10/08/2014	a	Autumn	Low Demand	Average Wind	Normal	Complex
10/08/2014	b	Autumn	Low Demand	Average Wind	2020 Wind	Complex
10/08/2014	c	Autumn	Low Demand	Average Wind	2020 Wind - Constrained I/C & No Pump	Complex
09/09/2014	a	Autumn	Average Demand	Low Wind	Normal	Complex
03/10/2014	a	Autumn	Average Demand	Average Wind	Normal	Complex
17/10/2014	b	Autumn	Average Demand	High Wind	2020 Wind	Complex
18/10/2014	a	Autumn	Average Demand	High Wind	Normal	Complex
21/10/2014	a	Autumn	Average Demand	High Wind	Normal	Complex
21/10/2014	b	Autumn	Average Demand	High Wind	2020 Wind	Complex
21/10/2014	c	Autumn	Average Demand	High Wind	2020 Wind - Constrained I/C & No Pump	Complex
03/12/2014	a	Winter	High Demand	Low Wind	Normal	Complex
07/01/2015	a	Winter	High Demand	High Wind	Normal	Complex
08/01/2015	a	Winter	High Demand	High Wind	Normal	Complex
09/01/2015	a	Winter	High Demand	High Wind	Normal	Complex
09/01/2015	a	Winter	High Demand	High Wind	Normal	Complex
09/01/2015	b	Winter	High Demand	High Wind	2020 Wind	Complex
09/01/2015	c	Winter	High Demand	High Wind	2020 Wind - Constrained I/C & No Pump	Complex
10/01/2015	a	Winter	High Demand	High Wind	Normal	Complex
11/01/2015	a	Winter	Average Demand	High Wind	Normal	Complex
12/01/2015	a	Winter	Average Demand	High Wind	Normal	Complex
13/01/2015	a	Winter	High Demand	High Wind	Normal	Complex
22/01/2015	a	Winter	High Demand	Average Wind	Normal	Complex

Trial Batch 3 – Complex Dates

- Some dates to be run using linked blocks

DELIVERY_DA	Set	Seasor	Load	Wind	Conditions	Order Book Form
07/03/2014	d	Spring	High Demand	High Wind	2020 Wind - Constrained I/C & No Pump	Linked Block
10/08/2014	d	Autumn	Low Demand	Average Wind	2020 Wind	Linked Block
03/10/2014	b	Autumn	Average Demand	Average Wind	Normal	Linked Block
21/10/2014	d	Autumn	Average Demand	High Wind	2020 Wind	Linked Block
21/10/2014	e	Autumn	Average Demand	High Wind	2020 Wind - Constrained I/C & No Pump	Linked Block

- Complex prioritised due to trial date constraint
- Additional linked block trials in the commercial phase
- Mix of coupled and de-coupled based on conditions requested

Trial Batch 3 – Execution

- All datasets submitted to APX

- Executed in EUPHEMIA and preliminary results returned:
  - Post processing required
  - Analysis and discussion with APX required

- Will be released to working group as soon as possible
  - ❑ Results of trials
  - ❑ Initial Phase report

Discussion of Confidentiality

Confidentiality of Trial Process Inputs

- SEMO host public workshops on EUPHEMIA:
  - Supplement the working group meetings
  - Will continue throughout the process
- To date data shared has been SEMO data:
  - Trial results
  - Information on the creation of trial data
- Going forward, this may need to change
  - More data will be produced by working group members (e.g. trial scenarios)

Confidentiality of Trial Process Inputs

- SEMO wish to discuss WG requirements for confidentiality

- Potential items to share with public:
  - WG members/member organisations
  - Details of trial inputs (e.g. scenario templates)
  - Details of WG discussions

- Further discussions can be had around unscripted/commercial order data in later phases

Questions for Discussion

- Are working group members comfortable sharing the following:
  - Name of member organisations?
  - Name of members?
  - Inputs which are not commercially sensitive (e.g. trial scenarios)?
- Are there any conditions working group members have for the sharing of data?
- Can agreed working group information be shared in public workshops hosted by SEMO?

Scenario Feedback

Scenarios Feedback – What goes into a trial scenario

Trading Day Conditions

Wind Profile	Load Profile	Unit Availabilities

Adjustments to Conditions

Alter Wind Profile (e.g. 2020)	Outages (e.g. I/C or Pump)	Alter Participation (e.g. non mandatory)

Scenario Feedback - Overview

- Feedback received from a number of organisations

- Feedback will form the basis of the trial script:
  - Script denoting what will be trialled by SEMO
  - SEMO will create data following the trial script

- Dataset creation will need to begin start of July:
  - Engagement with respondents over July
  - Any amendments or additional scenarios by COB 26/06/15

Scenario Feedback – Constraints on Process

- There are a number of constraints based on APX contract

- The following are not possible:
  - Scenarios significantly in excess of the 365 agreed
  - Trial dates less than 3 months old
  - Alterations to order books outside of the SEM
  - Trial dates from outside 2014/2015

- SEMO will accommodate as many trial scenarios as possible
  - Focus is on as comprehensive a process as possible

Scenario Feedback – Wind and Load

- High interest in the effects of wind:
  - Increased wind levels
  - Non-participation
  - Forecasting
  - Wind penetration/SNSP

- Interest in price effecting wind and load:
  - Need to engage with WG members on pricing
  - Need to determine the price which will be entered
  - Affects non-wind price taking generators also

Scenario Feedback

- Interest in the effect of outages:
  - Interconnectors
  - Pumped storage
  - Mid merit and baseload plant

- Interest in all order types:
  - Different scenarios with different order types
  - Combinations of order types in single scenarios
  - Differing order types for units on same trading site

Scenario Feedback – Amendments & Additions

- WG members may wish to change scenarios:
  - Add additional scenarios
  - Submit new scenarios
  - Amend existing scenarios

- Work will need to begin by SEMO 29/06/15:
  - Please use template when submitting
  - Please make all additional submissions by COB 26/06/15
  - SEMO will engage with WG members for clarifications where needed

Proposed Plan for Commercial Phase

Proposed Commercial Phase Arrangements

- The commercial phase is broken into three batches:
  - Scripted Trial – July - September
  - Unscripted Trial 1 – September/October
  - Unscripted Trial 2 – November/December

- It is SEMO's expectation that requirements will remain steady during the scripted trial

- Requirements will increase in the unscripted trial 1 & 2 beginning in September

Proposed Commercial Phase Arrangements

- The unscripted trial will require active participation:
  - Creation of trial data
  - Review of interim reporting materials
- SEMO available July – September for additional engagement:
  - Training in tools/process
  - Sessions for staff new to EUPHEMIA process
- These will need to be co-ordinated by SEMO for efficiency:
  - Multiple organisations per session, if required

Proposed Commercial Phase Arrangements

	July	August	September	October	November	December
Scripted Trial						
Unscripted Trial 1						
Unscripted Trial 2						

	Current Requirements	Extended Requirements

- Requirements in scripted trial at current level:
  - Meeting attendance/feedback
  - Review of materials
- Requirements in unscripted trial extended:
  - Active in creation of datasets

Next Steps

Next Steps

- SEMO will host public workshop 26/06 in EirGrid Offices

- SEMO will create data based on trial scenarios
  - Any amendments by COB 26/06, if possible
  - Bilateral engagement may be required in this period
  - WG members will not be required to create order data

- Next working group meeting in July (date TBC)
  - Final review of scenario data
  - Data will be submitted to APX end of July

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