

I-SEM Trialing of EUPHEMIA

Working Group 11
12TH April 2016



Agenda

- SEMO Update
- Batch Four Results and Analysis
- Unscripted Phase 1 Input Breakdown
- Trial Report
- Next Steps

SEMO Update

SEMO Update – Recent Activities

- NEMO BLG meeting held 04/04/2016:
 - Outlined initial details of NEMO implementation
 - Will provide forum for updates
 - Further information from the SEMO website
 - Next meeting 05/05/2016

- EPEX Spot/ECC kick-off meeting held:
 - Discussed items relating to implementation of DAM and IDM
 - Beginning of the programme for delivery of the services
 - Further update through the NEMO BLG meetings

Batch 4 Results and Analysis

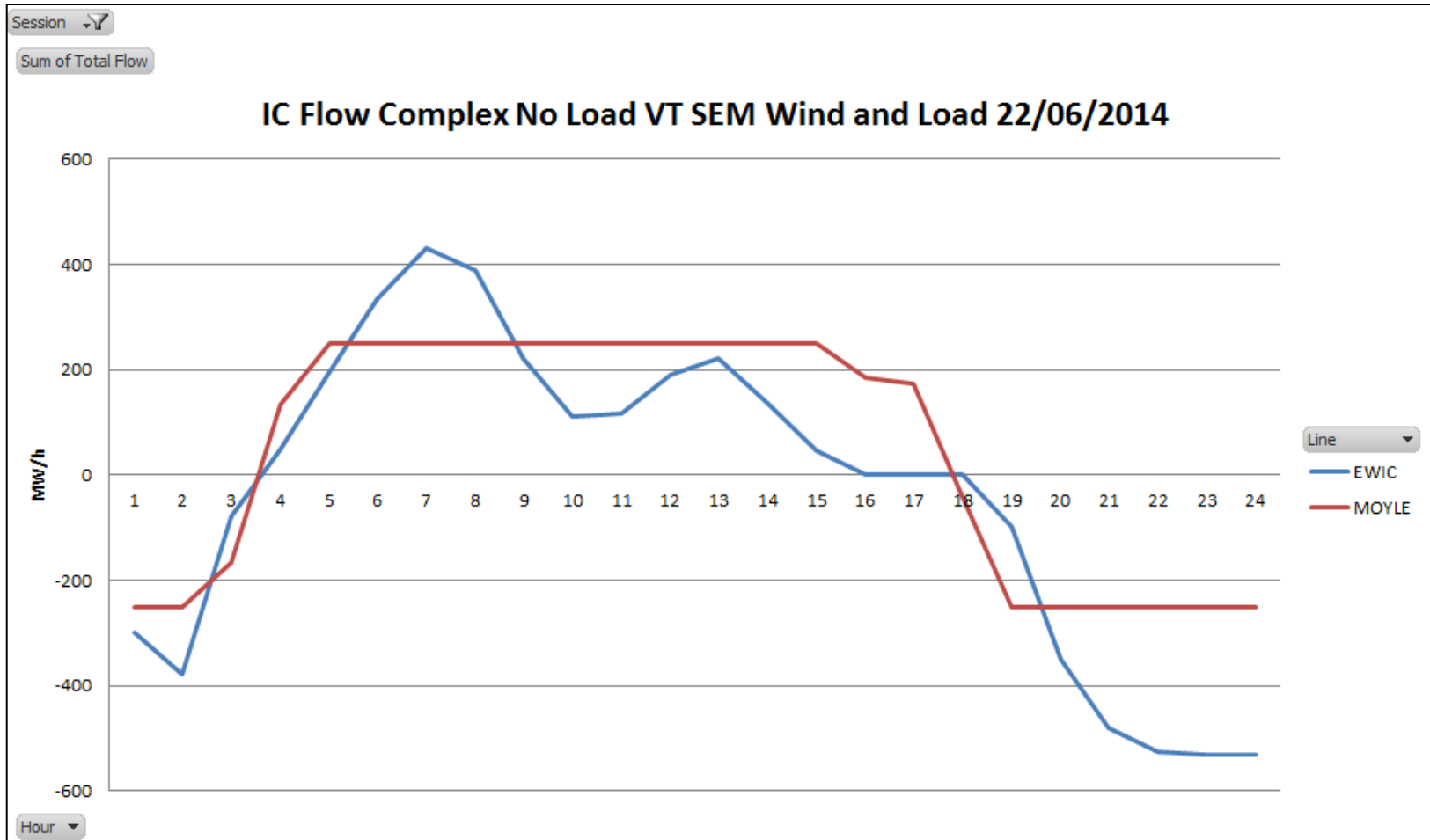
Batch 4 – Objectives

- Assess interconnector flows:
 - How do flows change when load and wind are aligned?
 - What effect does this have on prices in I-SEM/GB?

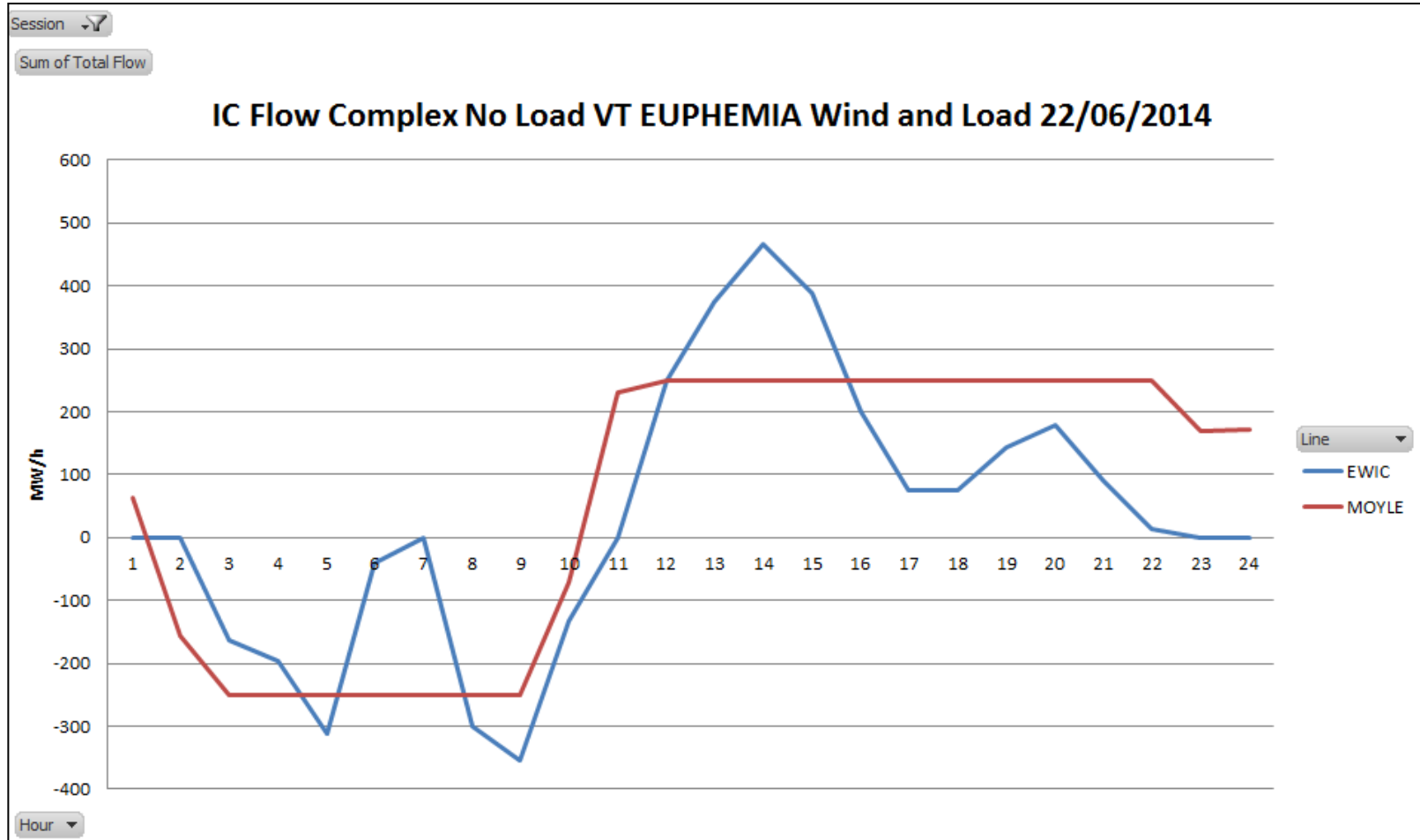
- Assess complex orders:
 - How does no VT affect prices?
 - How does no VT affect scheduling?

- Assess price taking demand with new assumptions:
 - How much of the stability/low prices is from demand?
 - Will lower prices lead to higher IDM/balancing price?

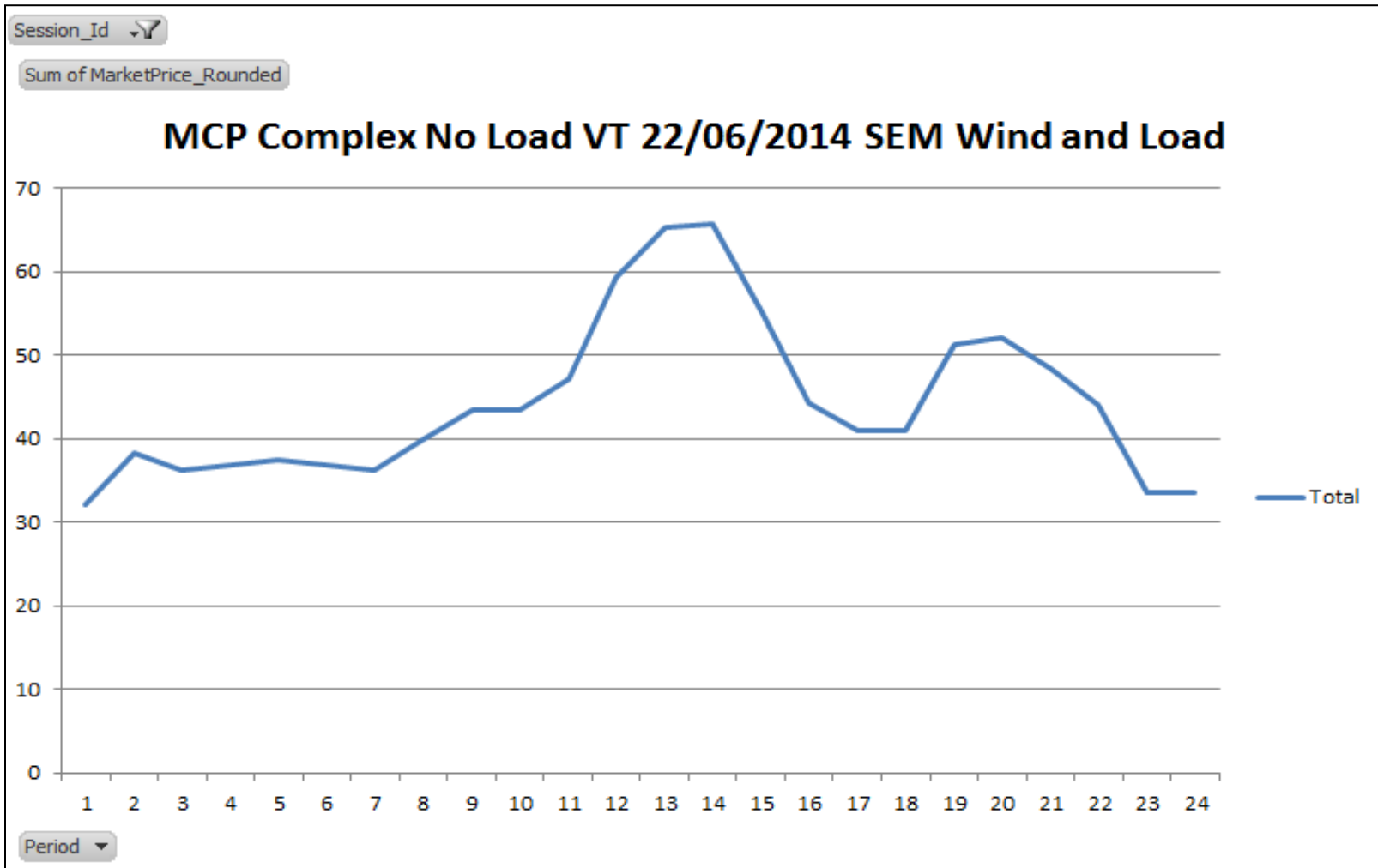
Batch 4 Results



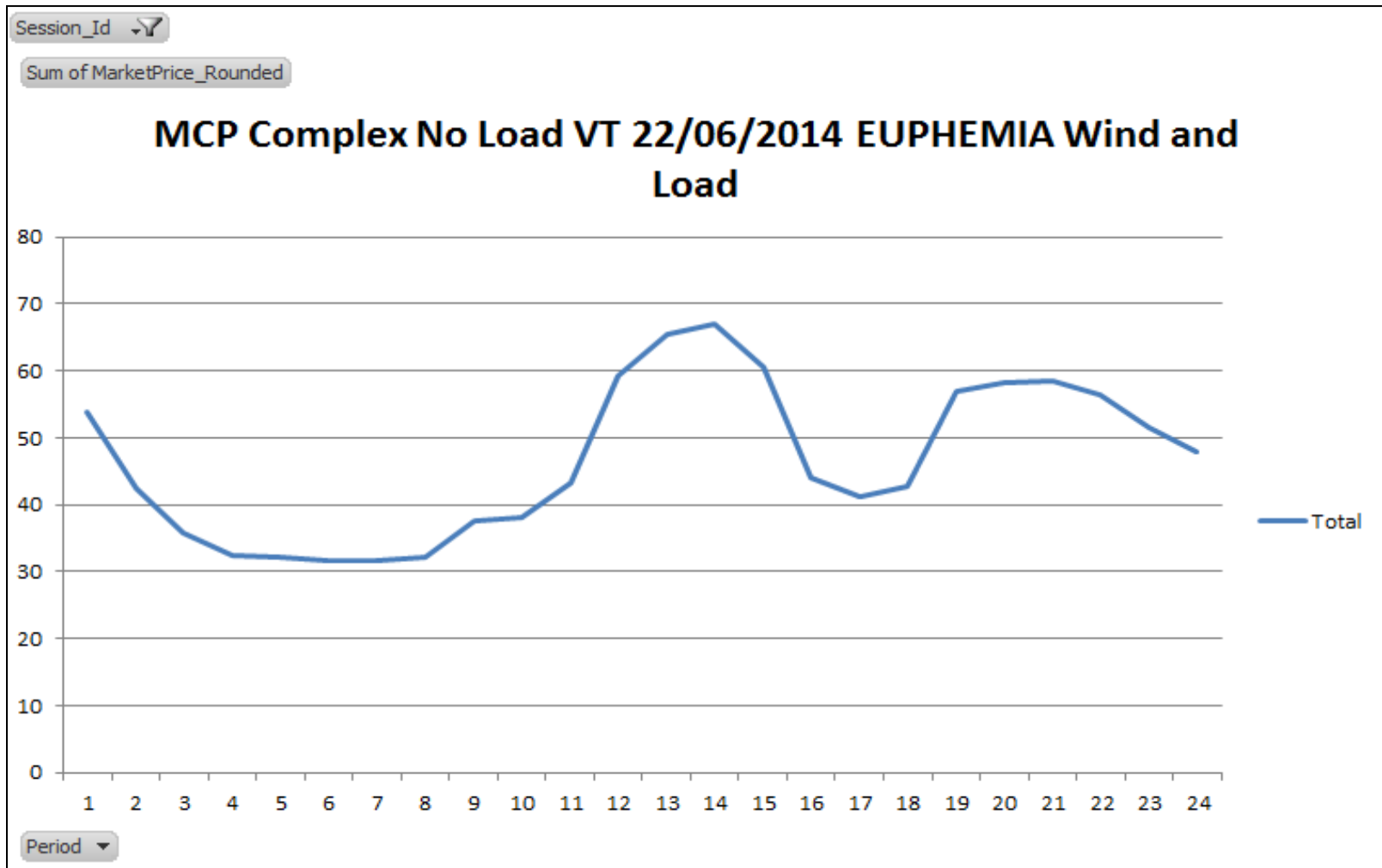
Batch 4 Results



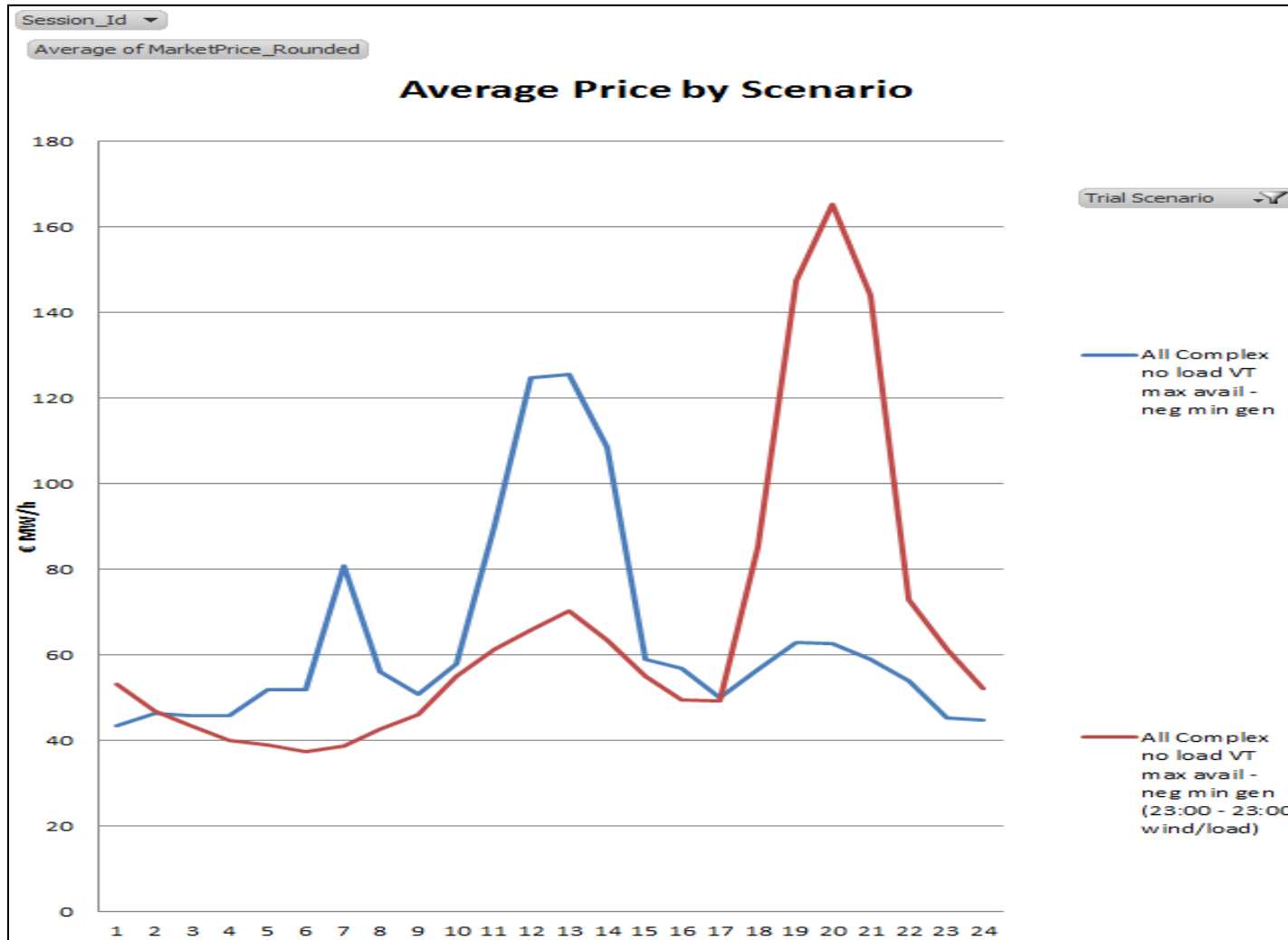
Batch 4 Results



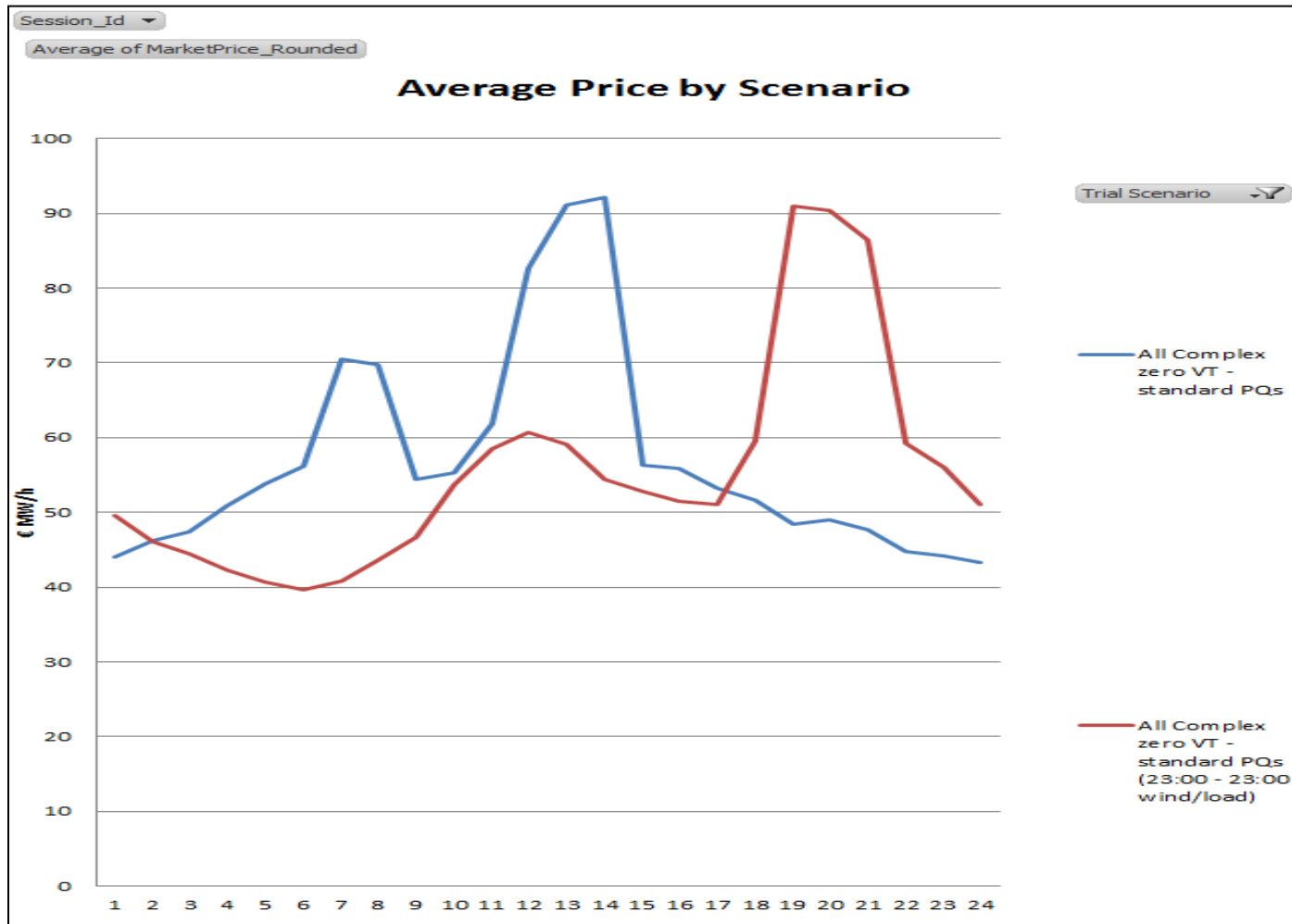
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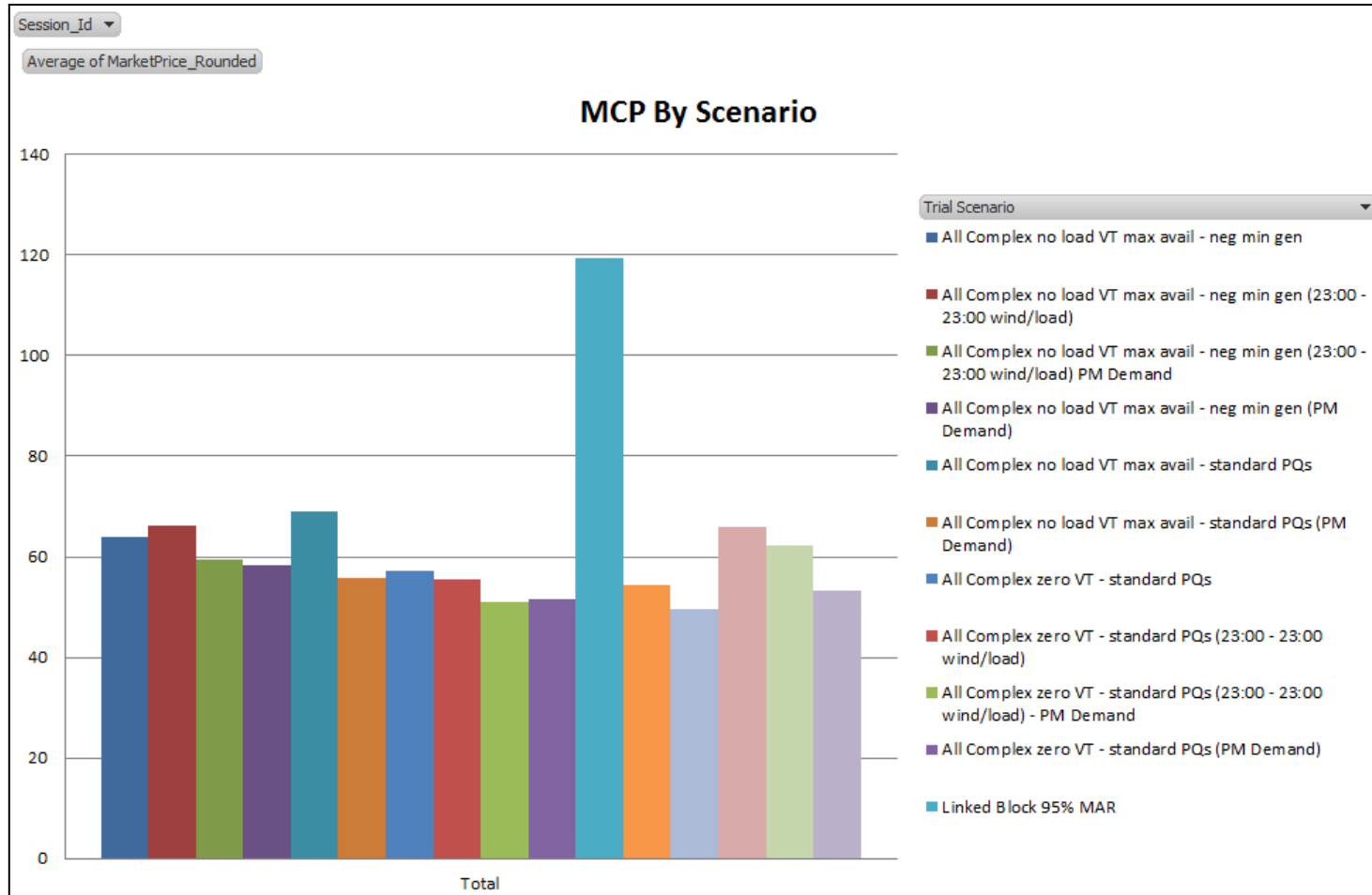
Batch 4 Results



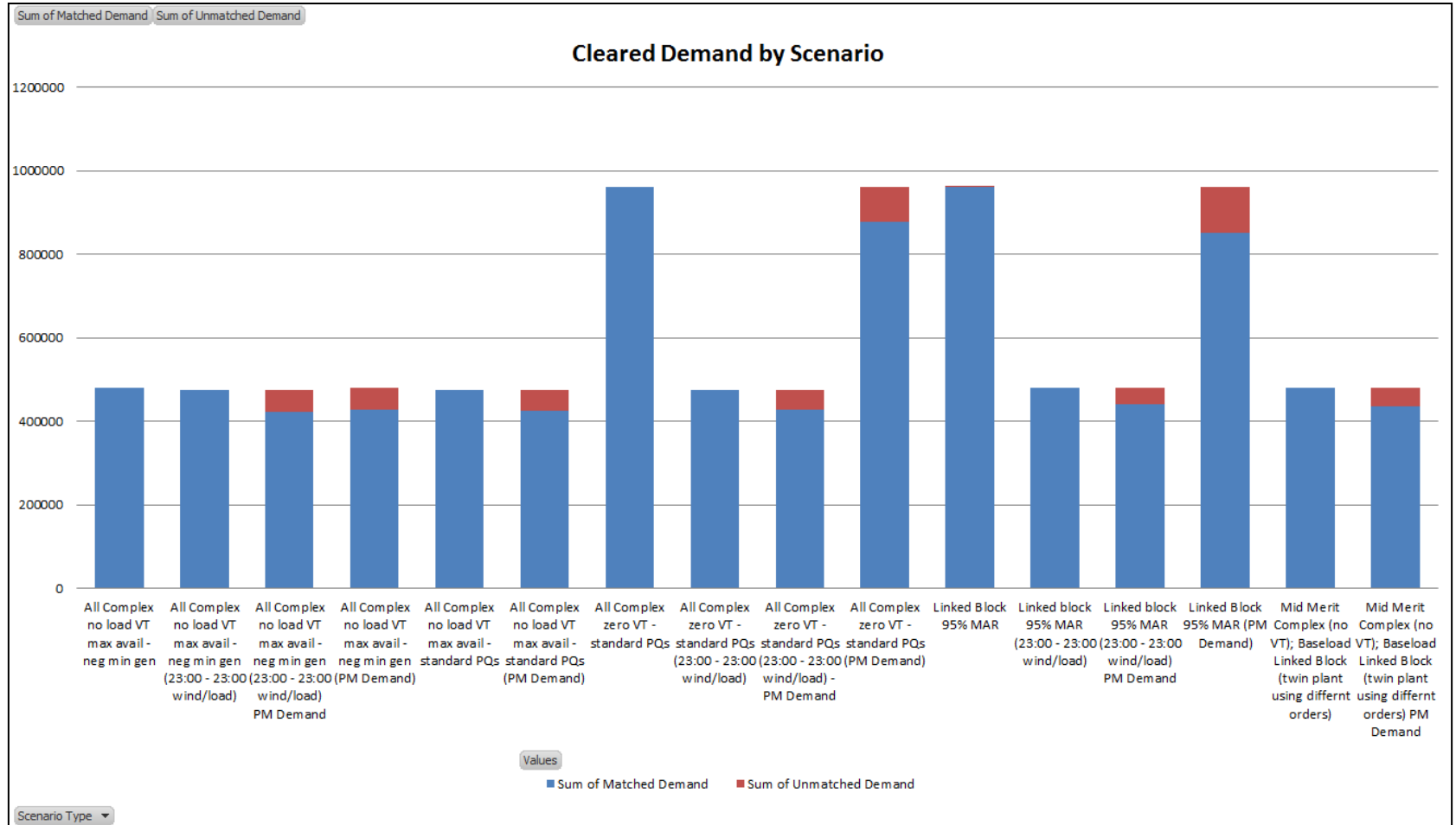
Batch 4 Results



Batch 4 Results



Batch 4 Results

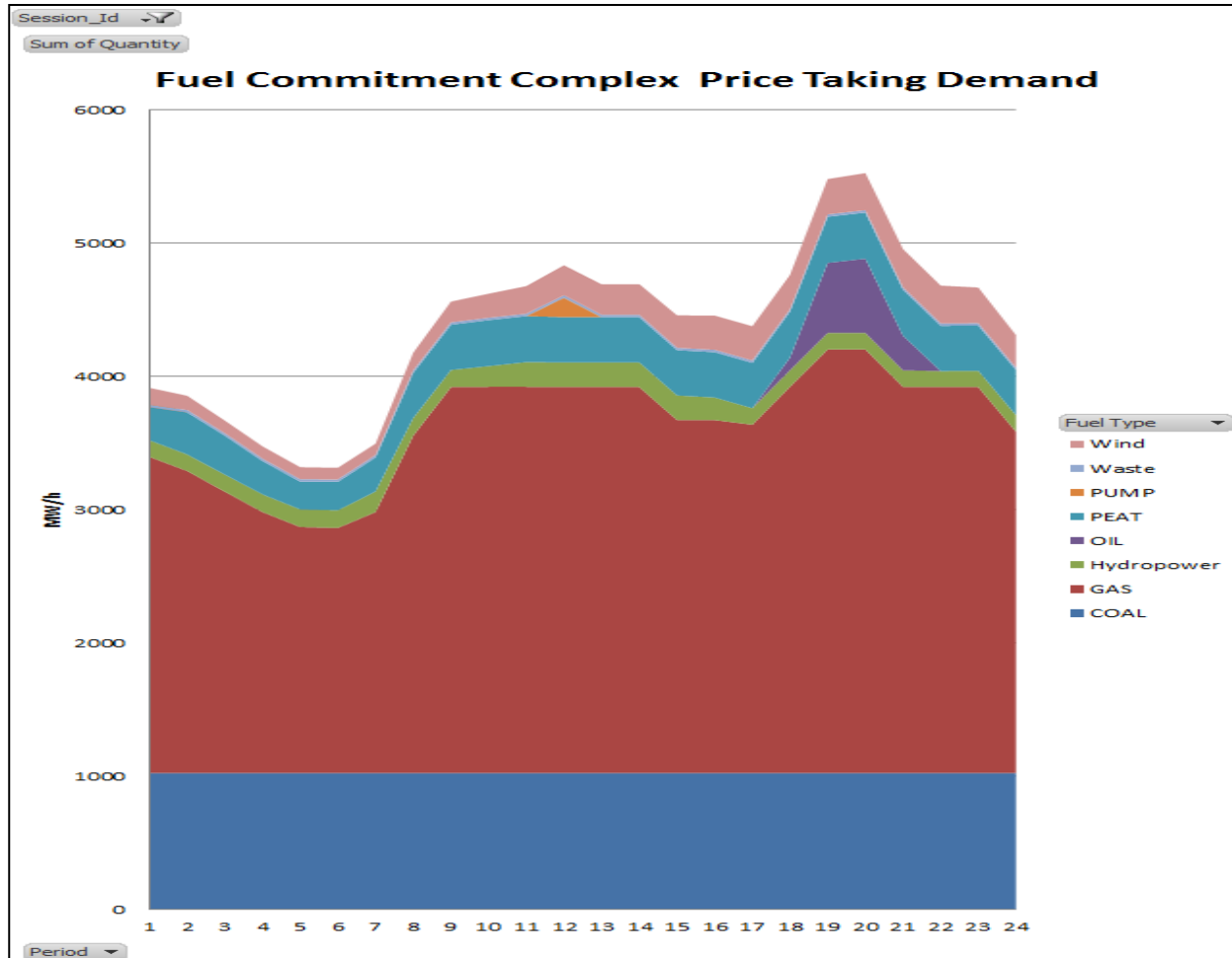


Batch 4 – Interconnector Flows

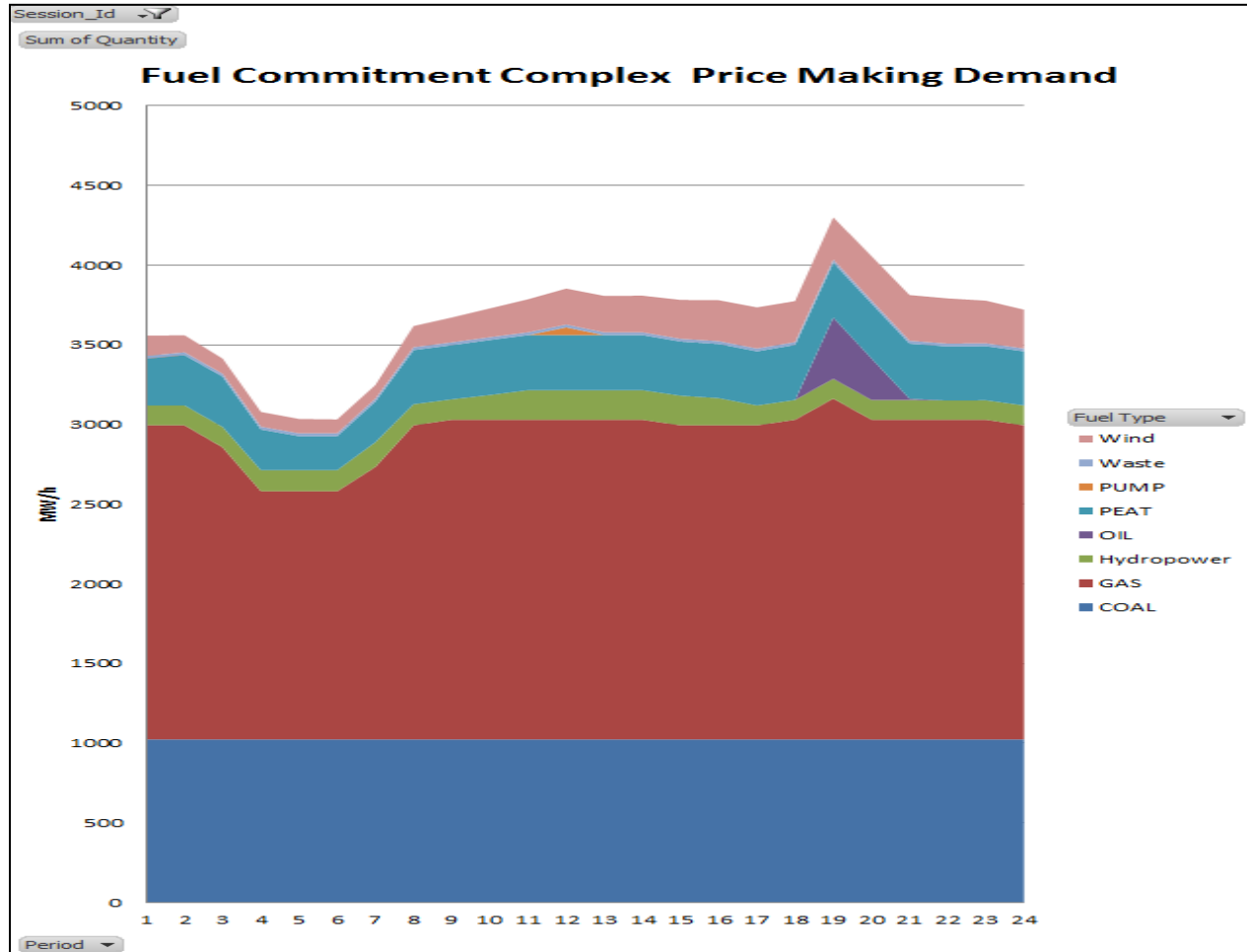
- Large changes to the flows on interconnectors:
 - Different across multiple periods
 - Sometimes completely opposite (i.e. full import v full export)
 - Follows price spread as expected

- Smaller effect on pricing than IC scheduling:
 - Prices similar in I-SEM and GB across methods
 - Likely due to GB price resiliency
 - SEM day comparison can be considered valid

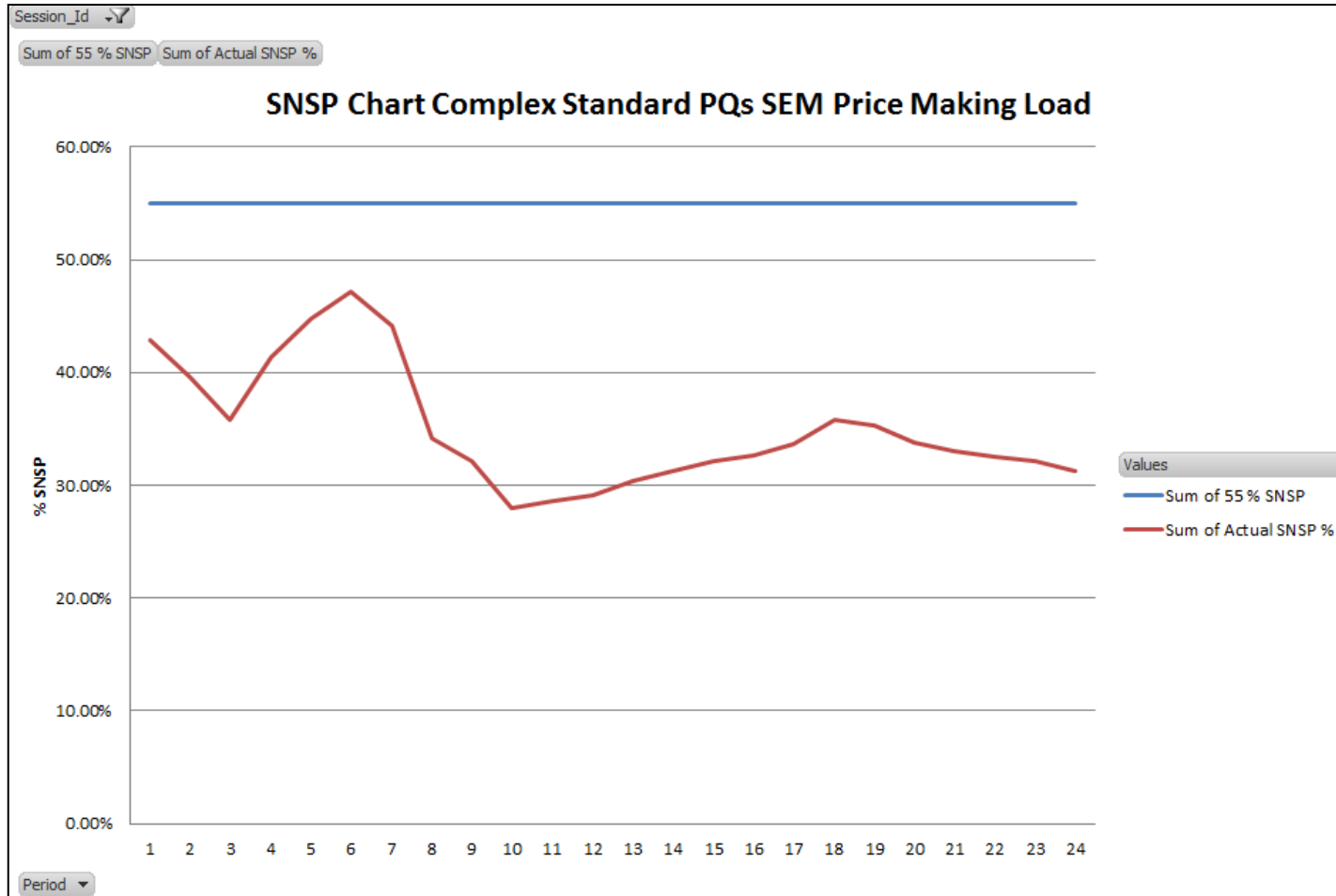
Batch 4 Results



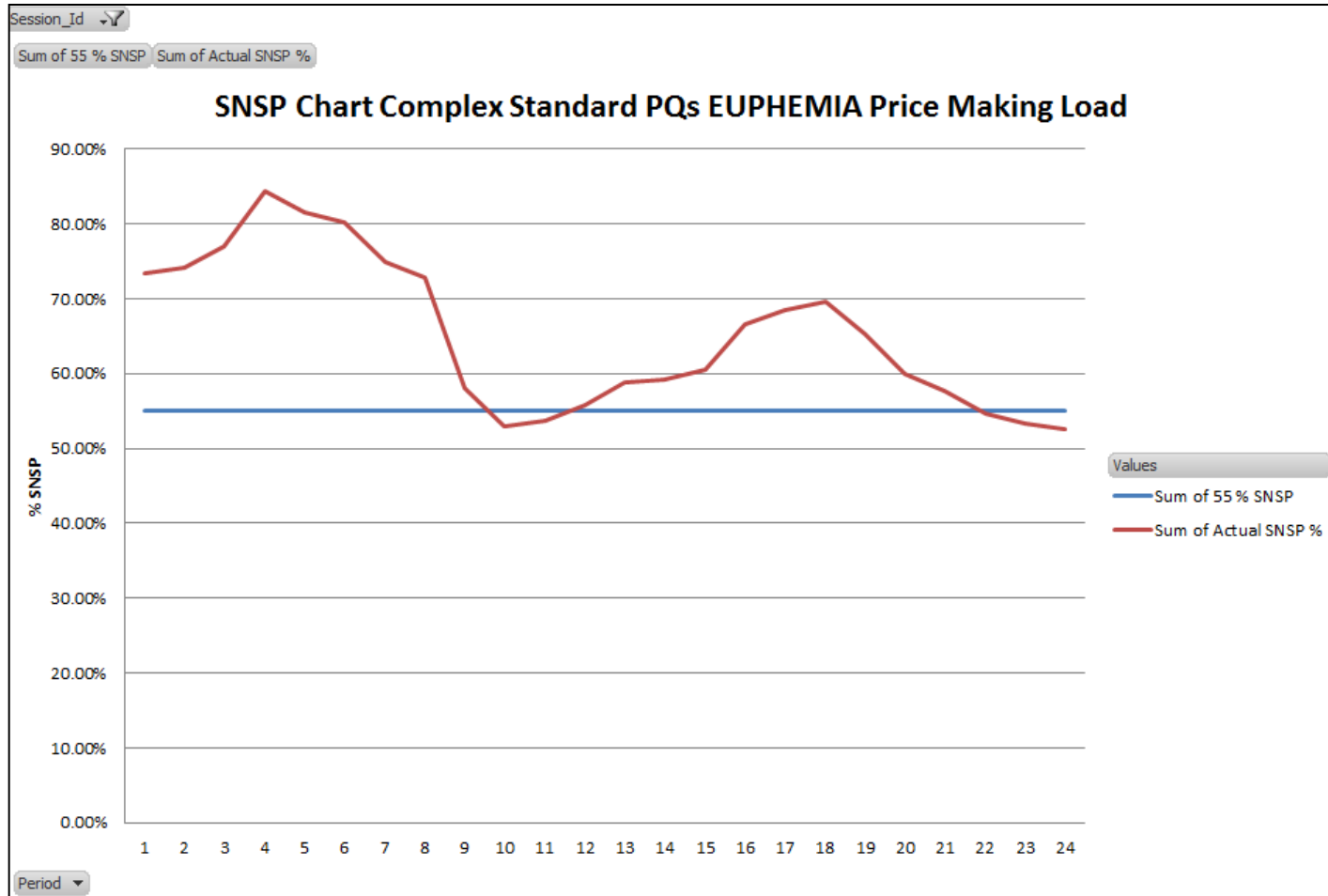
Batch 4 Results



Batch 4 Results



Batch 4 Results



Batch 4 – Initial Findings

- Interconnector flows:
 - Large change to interconnector scheduling as expected
 - Smaller magnitude of change to prices in GB and I-SEM

- Assess complex orders:
 - Lowered Prices with no VT

- Assess price taking demand with new assumptions:
 - lower prices likely to lead to higher IDM/balancing price
 - This is a results of out of merit generation at DAM level
 - Assumption that costs are represented in same way across timeframes

Unscripted Phase 1

Unscripted Phase 1 Inputs

- Inputs received 01/04:
 - Many thanks to those involved
 - No issues with received data

- Processing steps performed by SEMO on data:
 - Volumes rounded to 1 decimal place
 - Money amounts rounded to 2 decimal places
 - Supplier IDs changed for uniqueness (e.g. SU changed to SU_Energia)
 - Data collated into two files (1A and 1B)

Unscripted Phase 1 Inputs – Issue with Peakers

- Volumes calculated incorrectly for certain peakers:
 - Where peaker had non-zero min on time
 - Lower volume and higher price
 - Inputs corrected with an interim workaround

- Will be fixed for batch 2:
 - Formulas to be updated to account for min on time
 - Process steps will not be changed
 - Updated template will be provided
 - Interim solution – change min on time to zero

Unscripted Phase 1 Inputs – Demand Proportions

- Proportions not accurate reflection of market share:
 - Issues with data used to work out percentages
 - Inaccurate reflection of proportion of each supplier
 - Overall volume in the batch unaffected

- Revised data to be supplied:
 - The data will be fixed for batch 2
 - Will provide a better reflection of the market shares
 - SEMO will continue to bid for unassigned demand

Unscripted Inputs – Thermal Units

Generator Company	Linked block only	Complex only	Mix
AES			X
Aughinish		X	
BGE		X	
Bord na Mona			X
ESB GWM		X	
Energia			X
Gaelectric*	X		
Power NI PPB			X
SSE	X		
TEL			X

- Slight preference for a mix of order types
- Order types used in different ways by different participants

Unscripted Inputs – Wind Units

Generator Company	Price Taker	Price Maker
BGE	X	
Energia	X	
Gaelectric	X	
Power NI	X	
SSE	X	

- All participants used price taking orders for wind
- Remaining wind units will be entered as simple price takers
- This is consistent with treatment in later scripted phase batches

Unscripted Inputs – Supplier Units

Generator Company	Price Maker	Price Taker
BGE	X	
Electric Ireland	X	
Energia		X
Power NI		X
PrePay Power		X
SSE		X

- 4/6 participants used price taking orders
- Range of prices for the suppliers using price making orders
- Remaining demand will be entered as simple price takers

Unscripted Phase 1 Inputs

- Successful first run of unscripted process:
 - Inputs received without issue
 - Participants using a range of order types
- Results and inputs to be shared:
 - Collated inputs with rounding will be shared
 - Inputs and results will cover all units
 - Updated tools will also be shared
- Inputs for next batch by 29/04

Trial Report

Trial Report – Current Status

- Draft of report is still in progress:
 - Issues encountered during batch 4 process
 - Other I-SEM project commitments taking priority
 - Draft still in advance of planned programme

- Summary statement prepared:
 - High level summary of proposed report content
 - Will aid in drafting of the report
 - Based on the content presented in working group meetings
 - Act as preliminary strawman for discussion

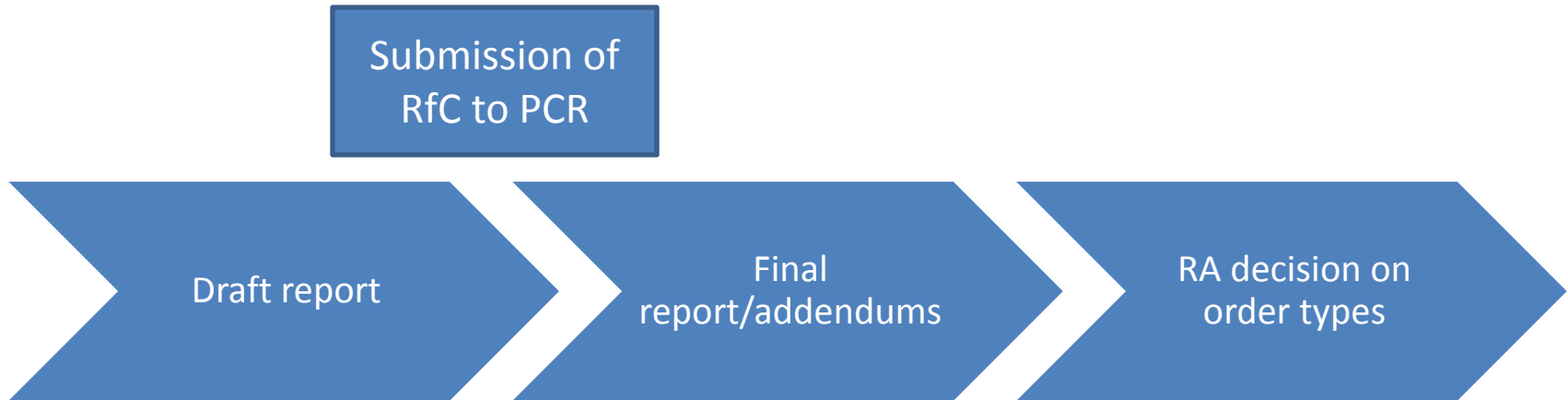
Trial Report – Request for Change to PCR

- Request for change to PCR must be submitted in near future:
 - Official change request to allow for I-SEM in EUPHEMIA
 - Needs to be submitted soon to allow for program delivery
 - Many other RfCs will be submitted for new borders (passport PXs)

- Will be subject to rigorous testing:
 - Testing of order types being used
 - Testing of technical implementation used
 - Impacts to other markets and EUPHEMIA delivery

- Final implementation will need to pass this testing
 - Ultimate decision will be made outside of the I-SEM

Trial Report – Context



- Will require two working assumptions:
 - Working assumption on order types in recommendation
 - Working assumption that decision is in line with recommendation
- SEMO feels enough trials are complete for working assumption:
 - Only 28 trial dates remaining (350 scripted complete)

Trial Report – Scripted Phase

- Has achieved its goals:
 - Expanded on the Initial Phase results
 - Understanding of order types increased
 - Initial Phase areas for further study have been explored
 - Further areas have also been explored

- Successfully prepared participants for unscripted trial:
 - Sufficient understanding of the order types
 - Participants able to attempt to implement strategies
 - Participants understand assumptions used in scripted phase
 - Participants can explore moving away from these assumptions

Trial Report – Complex Orders

- Risk mitigation is still key to understanding:
 - Effects of using MIC and PQ pairs
 - Robust strategies will likely need to use both
 - Load gradient and scheduled stop less important due to TOD
 - Participants will need to evolve strategies over time

- Complex orders can provide a solution for I-SEM:
 - Price formation and stability is best in complex datasets
 - Price formation is still good when de-coupled
 - Generators have methods by which they can mitigate risk
 - Can account for profiling by altering PQ values

Trial Report – Block Orders

- Exclusive group orders are a low priority for the group:
 - ❑ Preference was for linked block orders and complex orders
 - ❑ Exclusive group orders are not required or the I-SEM solution

- Linked block orders provide desirable advantages:
 - ❑ Offer control over the costs associated with profiles

- Blocks as sole solution cause issues:
 - ❑ Insufficient price makers from simple orders
 - ❑ Prices too volatile at times of IC congestion
 - ❑ Issues linked to overall liquidity

Trial Report – Simple Orders

- Simple orders can be flexibly used:
 - Profiling built into the volumes offered
 - Costs implicitly built into the order price
 - Suitable for a range of different unit types
 - Likely to be used by the majority of units

- Insufficient knowledge of final design to predict liquidity:
 - Unclear on incentives in place for suppliers and wind
 - Unclear on participation of assetless traders
 - Role of aggregation may effect the level of simple orders used

Trial Report – Interconnectors

- Representation in line with I-SEM HLD:
 - Separate modelling of interconnectors
 - Individual results produced in line with expectations
 - Interconnectors have positive effect on price formation

- Final implementation may differ from trial:
 - Technical differences only
 - Functionally the same as in the trial
 - Requirement to accommodate other design elements in topology

Trial Report – Unscripted Phase

- Will allow hands-on experience in developing orders:
 - Participants can implement their own strategies
 - Better chance for strategies to match to specific units
 - Inputs show different strategies being used by different participants

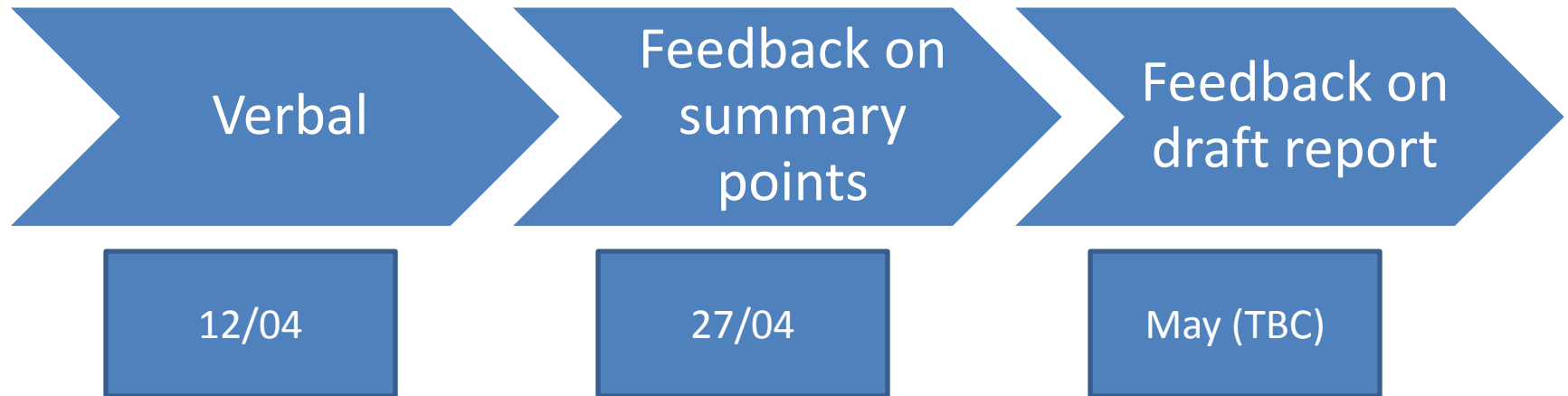
- Majority of learning from the scripted phase:
 - Focus on same order types as previously
 - Hard to predict outcomes due to unscripted nature
 - Cannot assess outcomes against expectation
 - Value is in simulation of multiple strategies concurrently

Trial Report – Implementation

- I-SEM market will follow HLD:
 - Step-wise orders
 - Interconnector representation (losses, ATC, ramping)
 - Dual currency
 - Technical implementation will accommodate these elements

- I-SEM market will use multiple order types:
 - Simple orders
 - Complex orders (all conditions)

Trial Report – Process for feedback on initial points



- SEMO will proceed with drafting based on verbal feedback
- Working assumption for RfC based on feedback
- Final report will reflect all feedback received

Next Steps

Next Steps

- SEMO to release unscripted phase results:
 - Full results will be shared
 - Results in same format as scripted results

- Revised data template proportions:
 - Corrected for demand proportions
 - Minor updates to overcome encountered issues

- Unscripted Phase 2 Inputs:
 - Inputs to be sent to SEMO by 29/04

Final Meeting

- Final meeting scheduled for 18/05
 - EirGrid offices
 - Conference call available

- Main goal to address final points:
 - Feedback on the trial report
 - Final items of analysis

- Further work on DAM and IDM through BLG:
 - NEMO implementation workstream
 - Next meeting 05/05

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