Market Operator User Group

Dublin, 8 November 2018



Agenda

Item	Presenter	
Welcome	Simon Grimes	
Ex-Ante Market	Liam McAllister	
Balancing Market	Aodhagan Downey, Sam Matthews, Brendan Ring	
Disputes - Repricing and Resettlement Update	David Carrol	
Settlements & Funds Transfer	Sean O'Rourke, John O'Dea	
Pre Go-Live Known Issues Update	Jonathan Jennings	
Query Management	Claire Breslin	
Q&A		



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Ex-Ante Markets : 31 Days Our Highlights

- Market **STABLE** and performing
- Approx. € ¼ BILLION Cleared through our EX-ANTE MARKETS
- Just over **3TWh** of Energy traded in October
- Our DAM auction is clearing **98%** of Suppliers' demand requirements
- With Average price of **€72.44** (GB neighbour avg price **€72.57**)
- As expected we are highly correlated with our Euphemia partners!
- Interconnectors are efficient
 - Importing when demand is high and exporting off the Island when excess energy available



Ex-Ante Markets

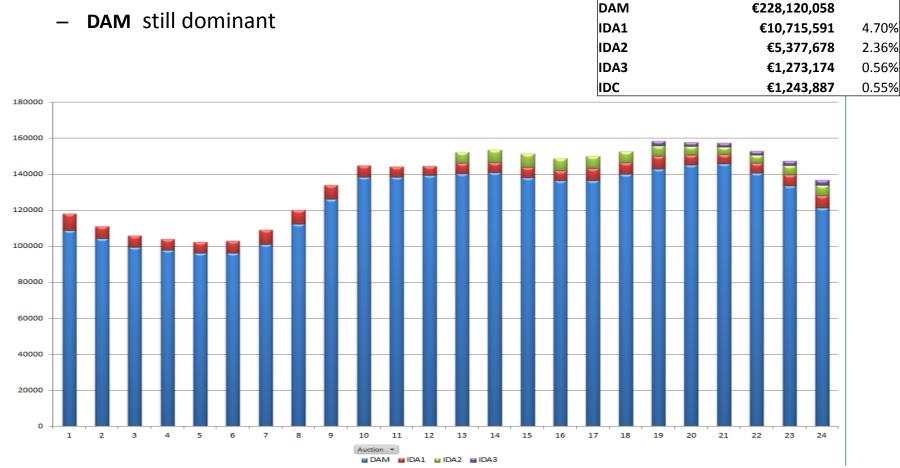
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Market Operato

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EIRGRID

Volumes from ex-ante auctions (1st Oct – 31st Oct)
 Market

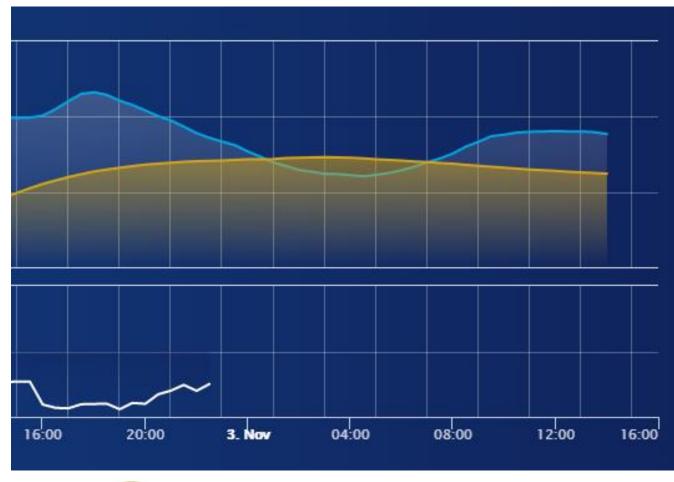


*Using approx. prices

Value

% of DAM

• 3rd November – High Wind / Low Load forecasted



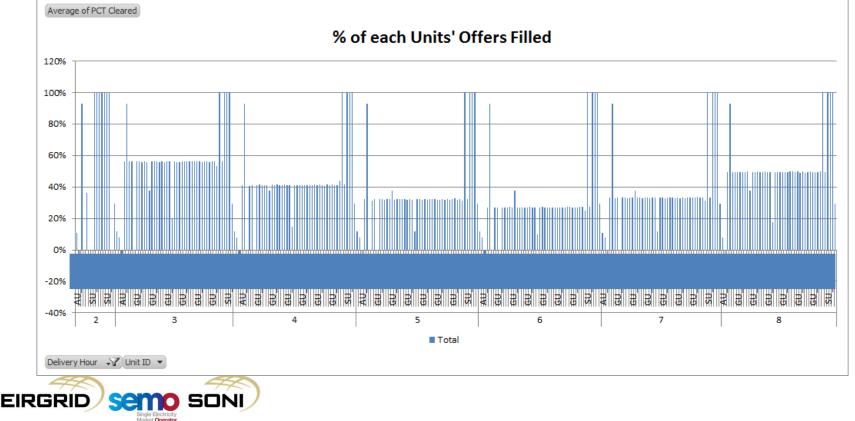


• 3rd November – Multiple hours of low prices observed in DAM



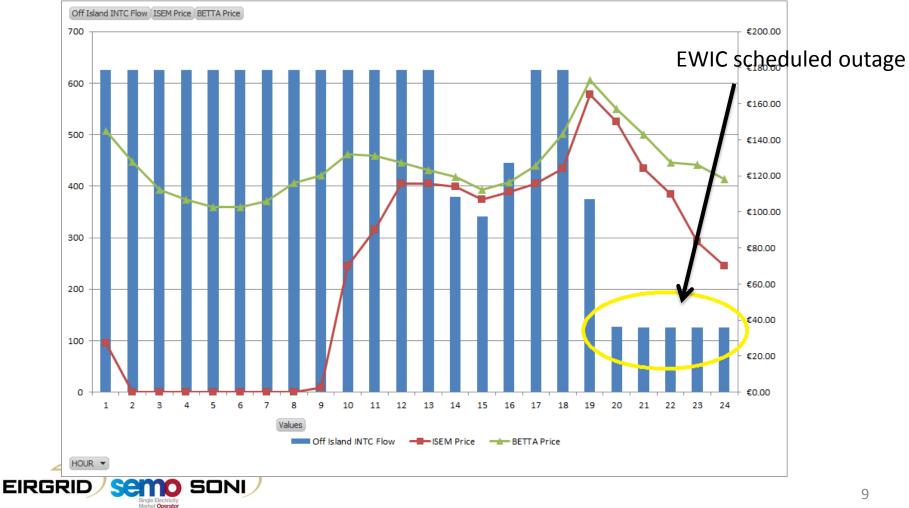


- 3rd November Multiple Units Offering in as 'Price Takers'
 - Several units offered into the market willing to accept *any price* to disburse energy or stay ON, and several units offered in between €0-3000.
 - Euphemia Algorithm treats each of them as one block of energy
 - All units got a % of their volume cleared up to the total block amount

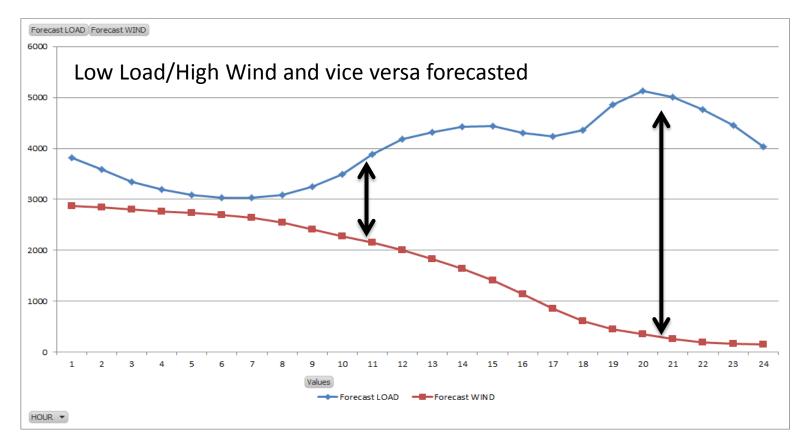


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- 3rd November What were the Interconnectors doing?
 - EWIC & MOYLE on full export

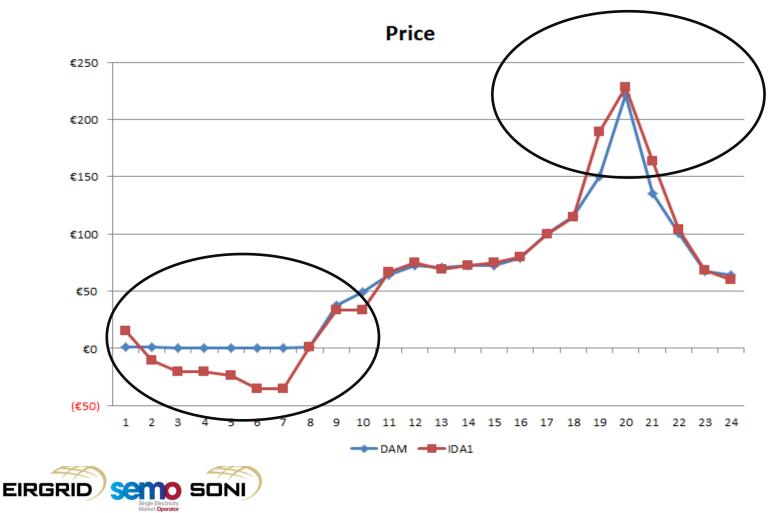


• 4th November – Similar, but different Load & Wind Picture



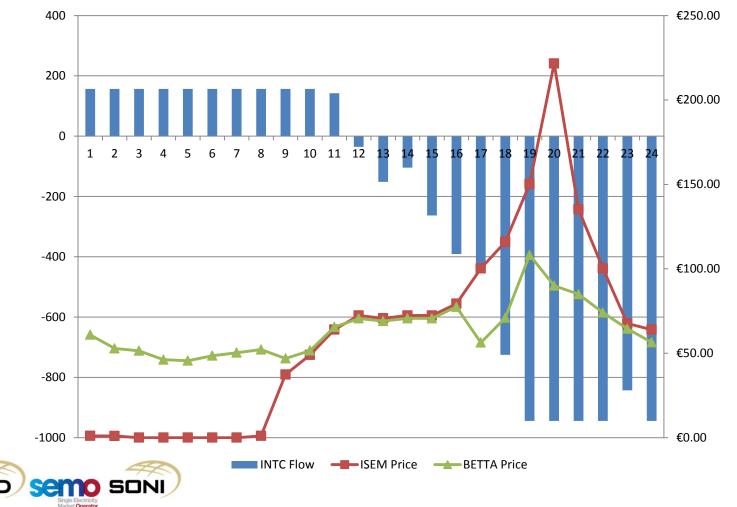


- 4th November High and Low Prices across the day in DAM
 - EWIC was scheduled to come back online Sunday afternoon, but didn't.



EIRGRI

- 4th November Similar Price Action Observed in 1-8 hours
 - EWIC stayed on outage, MOYLE exported initially, then full import, as demand increased

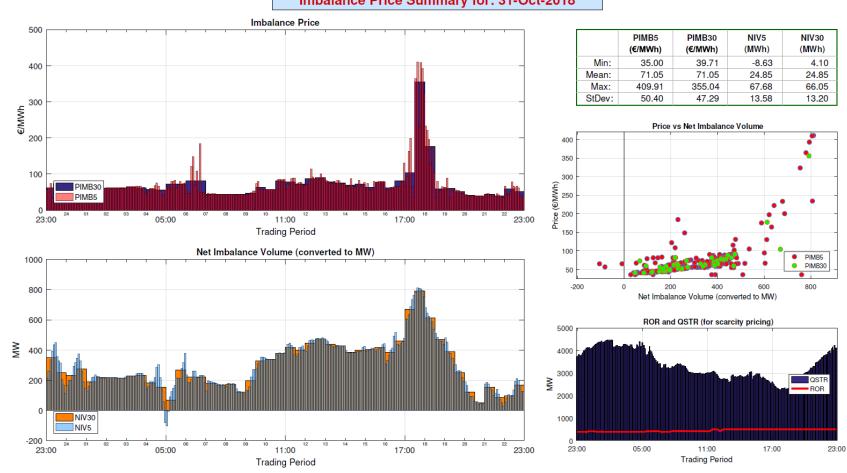


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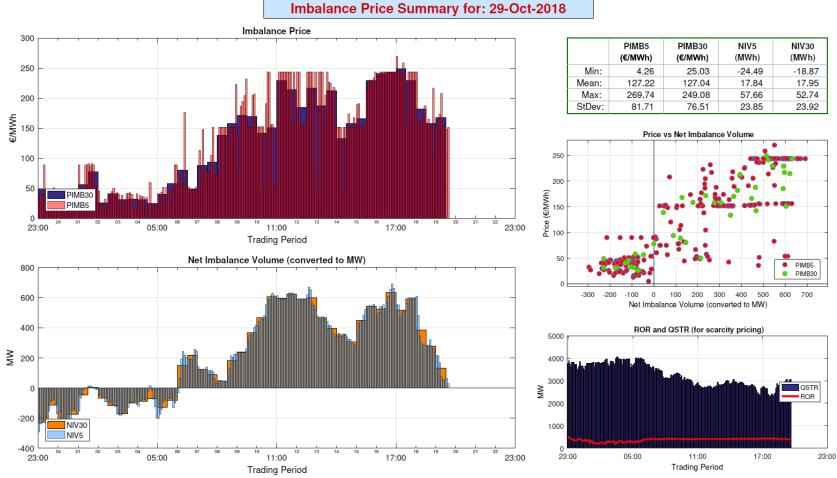
Imbalance Pricing



Imbalance Price Summary for: 31-Oct-2018

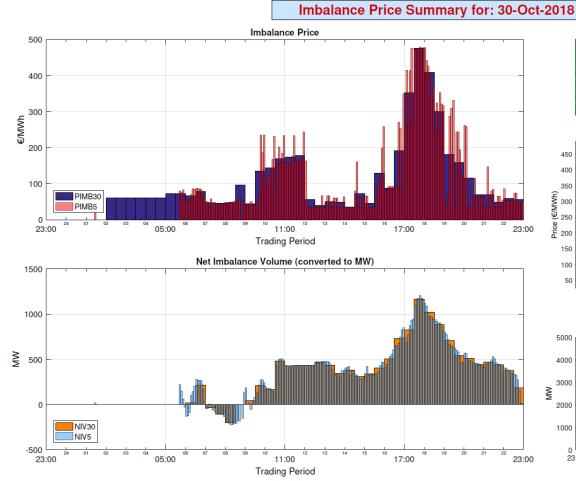


29th and 30th October Events - Pricing

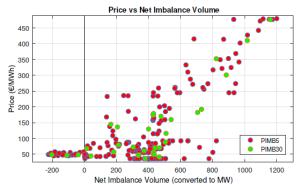


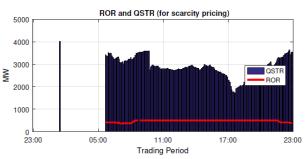


29th and 30th October Events - Pricing



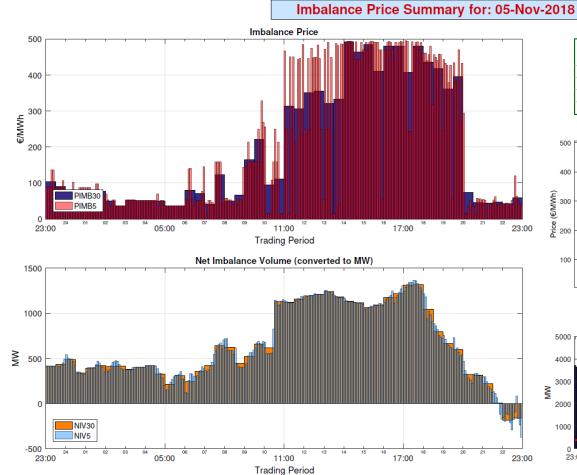
	PIMB5 (€/MWh)	PIMB30 (€/MWh)	NIV5 (MWh)	NIV30 (MWh)
Min:	35.00	35.00	-18.62	-16.83
Mean:	123.48	113.80	32.50	34.21
Max:	478.57	475.68	100.17	96.86
StDev:	118.52	101.47	26.01	25.20



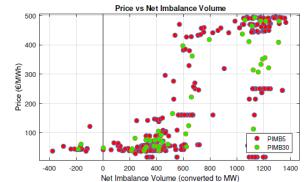


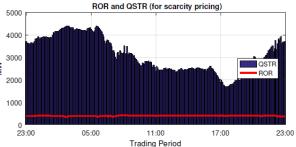


5th November - Pricing



	PIMB5 (€/MWh)	PIMB30 (€/MWh)	NIV5 (MWh)	NIV30 (MWh)
Min:	15.00	37.00	-31.20	-15.17
Mean:	197.19	197.19	54.13	54.13
Max:	495.25	492.55	113.90	109.67
StDev:	185.32	170.27	34.41	34.41







Observations About The First Month

- During the course of the first month of the I-SEM a lot of queries about the market have been submitted.
- These have at times indicated concerns or confusions about the new market.
- This presentation seeks to provide a high level response to some of the most common points raised.
 - We highlight key observations that may help to focus thinking about the performance of the market and near-term actions that may improve any aspects of market operation
 - We do not explore known issues where specific data issues have occurred.
 - The high level focus of this presentation may ignore some finer points of the market design.

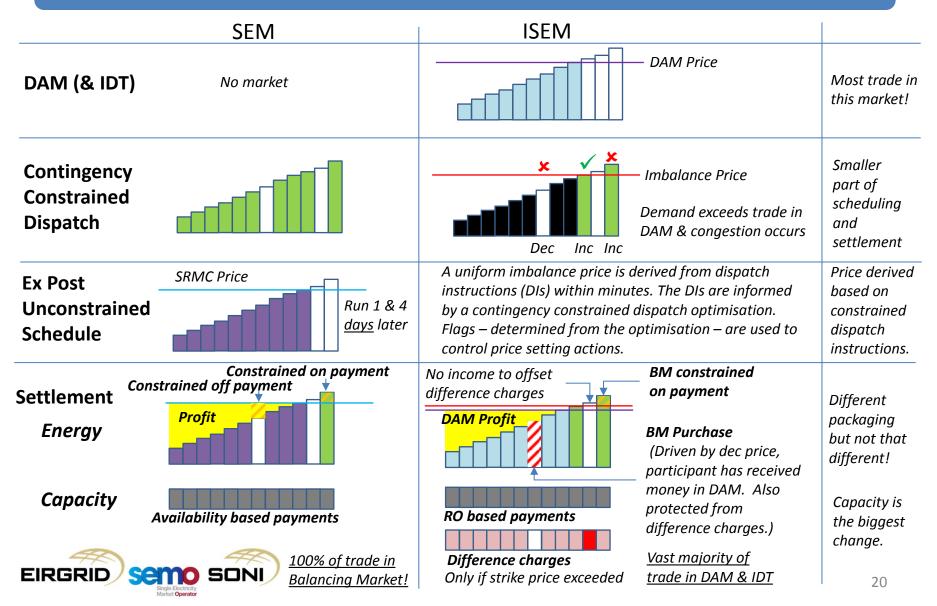


Key Concerns Covered

- Concern about relationships between prices and schedules.
 - Why was my unit not dispatched when imbalance price is above its cost?
 - Why were high priced bids scheduled but the imbalance price is lower?
 - Why was a unit flagged (or not flagged)?
 - Why are imbalance prices volatile?
- Concern about differences between dispatch and schedules.
 - The schedule has a plant running but it was not dispatched!
 - The plant was dispatched but it is not shown in the schedule!
- Concern about cashflow impact of negative prices.
- Concern about exposure to difference charges on reliability options.



The Key Balancing Market Changes



System and Market Operations Are More Linked

- The Grid Code is a primary driver for the System Operations and the Grid Code takes precedent over the Trading and Settlement Code.
- In the new market, System Operator actions have impacts on prices and trading:
 - Events are more immediate and 24/7, for example:
 - SO system outages can require use of back up prices for a period of time.
 - Errors in data used in dispatch can flow immediately through to pricing.
 - SOs can issue dispatch instructions which differ from scheduling solutions for security and reliability reasons. Flags for units are set by optimisation, BOA are based on dispatch instructions.
- Greater flexibility to rebid can move dispatch around more than before.
- While this is a new world for participants, it is also a new world for Eirgrid and SONI and it will take some time to fine tune the priority of secure system operation with best practice processes for avoiding unnecessary impacts on the market.



Imbalance Price Volatility

- There are three effects driving volatility relative to the SEM
 - Some price variations will be related to everyone in the market still "learning the ropes".
 - Physical effects such as changing wind patterns.
 - Shorter time frame for pricing and scheduling (5 minutes) must naturally have some impact. For example:
 - Bringing a new unit into the dispatch will make a difference between 5 minute periods rather than between half hour periods.
 - Constraints that bind in one 5 minute period and drive flags may not bind in the next.
- Averaging prices to a half hour time frame does moderate volatility.
- Keep in mind that level of trade in BM is a small part of market and it can be a very constrained and wind affected system.

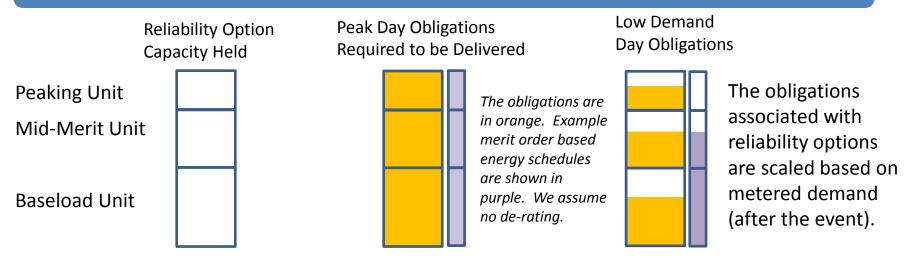


Protection from Extreme Prices

- Exposure avoided through being scheduled in DAM & IDT
- Potential exposure to the imbalance price:
 - If prices exceed the strike price then reliability options protect suppliers, while capping the price seen by energy producers. Those generators holding reliability options who are not generating are exposed to difference charges. See next slide.
 - Suppliers may be exposed to high prices below the strike price. They can
 protect themselves by trading in the DAM & IDT to cover forecast load.
 - Depending on their circumstances generators in the balancing market can be impacted by negative prices. But...
 - If they have a DAM or IDT position and are dec'd (due to too much generation) they are charged at a negative price. They are paid to reduce generation.
 - If inc'd in the Balancing Market, they are paid a negative price, which costs them. But they can set inc prices at the level they are happy with.
 - Intermittent units may receive other payments through non-electricity market mechanisms which allow them to absorb some degree of negative prices.



Hedging Difference Charges



On a peak day generators will have to meet their full obligations. Such days are predicable. Generators can cover this through participation in the DAM & IDT or being scheduled in the BM.

Off-peak days are more challenging. Prices can still be high due to contingency events and the event may be at too short notice for a generator to come on line. While being constrained off is a valid excuse, the generator must be scheduled on (e.g. via DAM/IDT trades) to be constrained down/off. Hedging options include:

- Selling energy into the DAM & IDT to match obligation and then have output raised or lowered in Balancing Market. But a high cost peaking unit will not clear in the DAM if demand is low and can be supplied by base loaded units.
- Financial hedging between (groups of) generators linked to the imbalance price, with low cost units that operate above their obligations compensating higher cost units that don't run.



Closing Remarks

- While there are some BM teething issues this is not unusual and the fact that most trade goes through the DAM and IDT limits their impact.
- Real-time schedules are based on a contingency constrained optimisation units are not simply scheduled based on a merit order cost ranking. This is the intended design.
- Prices are based on dispatch instructions, the optimisation solutions set most flags.
- There is a single uniform imbalance price even if the system is significantly constrained. Flagging cannot be expected to reproduce the same price as the SEM unconstrained schedule. Constrained on / off settlement arrangements exist to provide protection.
- Everything is happening faster with high system availability being more important for price production (and avoiding resorting to back up pricing).
- The risks of cost exposures can be mitigated. It is accepted that mechanisms to hedge against risks around difference charges may not be mature yet.
- Volatility is a by-product of limited market experience, intermittency, constraints and a shorter scheduling window. It should improve to some degree with experience.
- Transparency is more important in the new market as 24/7 dispatch actions impact pricing and trading (and potentially insider trading!). Maximising transparency is an issue for both the SO's and the participants.



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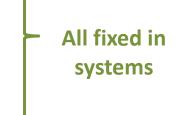


Re-Pricing

- 5 manifest errors
 - Negative Reserve
 - Exchange Rate
 - Non controllable wind QBOAs
 - Incorrect QBOA for a decommissioned unit

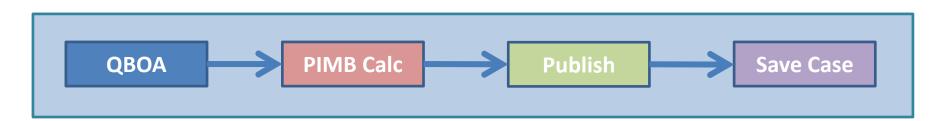
Pricing Disputes

• Incorrect QBOA for a unit





Re-Pricing Option A

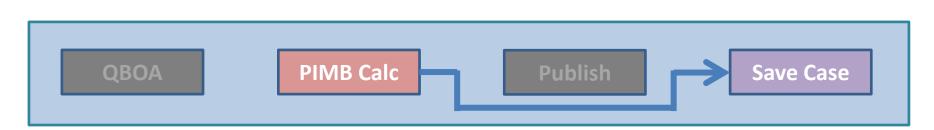


- Automated approach being developed by ABB
- Reruns all process associated with Imbalance Pricing
- Solution delivered by ABB ~ end Nov
- Testing to be carried out ~ mid Jan
- Re calculated impacted Imbalance Price Periods ~ end Jan
- Materiality checking ~ end Jan
- Objective is to feed into M+4 Resettlement ~ Feb

Timings are indicate based on current estimates



Re-Pricing Option B



- Semi-automated approach developed in house using ABB system
- Used for issues after 'QBOA' stage of calculation so limited uses
- Testing completed on 45 x 5 min Imbalance Price periods
- Further testing and review ~ mid Nov
- Legal and Regulatory discussions on suitability of this approach with respect to the Trading & Settlement Code
- Update to be provided following above reviews

Timings are indicate based on current estimates



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Settlements : Key processing updates

Trade Dates	Туре	Run Type	Executed runs
30 th Sep – 6 th Nov	Settlements	Indicative	39
30 th Sep – 1 st Nov	Settlements	Initial	33
30 th Sep – 7 th Nov	Credit Reports	Daily	~65
30 th Sep – 2 nd Nov	Settlement Documents	Weekly	4
30 th Sep – 21 st Oct	Payments In & Out	Weekly	4
1 st Oct – 31 st Oct	SEMOpx Settlement Fee File	Monthly	1

- Weekly Settlement documents published per timelines for all scheduled dates
- Strong focus continues on meeting evening timelines for indicative runs Long day 28th issue
- 3 * Credit Reports issued daily



Settlements : Upcoming events

Trade Dates	Туре	Run Type	Date
28 th Oct – 3 rd Nov	Settlements Documents	Weekly	09/11/2018
1 st Oct – 31 st Oct	MO Charges	Monthly	09/11/2018
1 st Oct – 31 st Oct	Capacity Statements (CRM)	Monthly	09/11/2018

Daily Credit Reports:

- Three Daily Credit reports published Start time of 09:00am, 12:00pm & 3:30pm
- Typically published within 1 hour of start time

BAL/IMB / <u>CRM</u> Payments in/out:

- Payments in date for Settlement Documents issued 9th Nov : D+3 by 12:00pm
- Payments out date for Settlement Documents issued 9th Nov : D+4 by 17:00

MO Payments in/out:

- Payments in date for Settlement Documents issued 9th Nov : D+5 by 12:00pm
- Payments out date for Settlement Documents issued 9th Nov : D+6 by 17:00

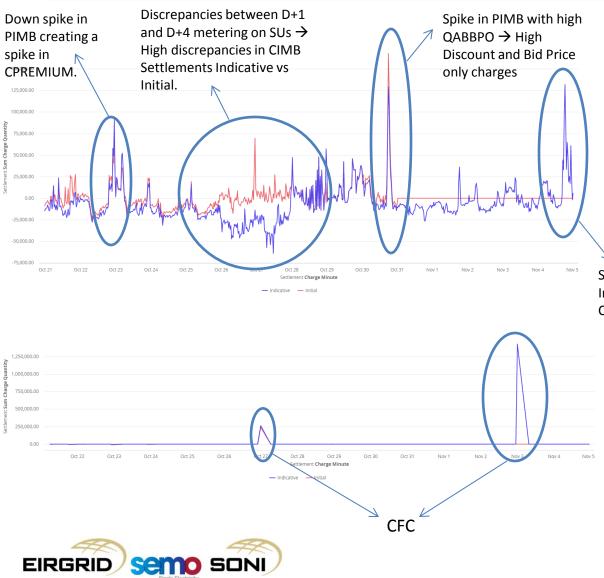


Settlements : Ad-hoc Resettlement update

- Ad-hoc resettlement being reviewed for those items separate to the update on repricing resettlement
- Settlements are reviewing resettlement items with a view to including prioritised items/resettlement periods within the Settlement documents due to issue end of November/early December
- Updates to be provided through market messages over the next week re: what will be included and for what settlement periods
- Settlement calendar will be also updated with planned ad-hoc resettlement



Settlements – Balancing Market



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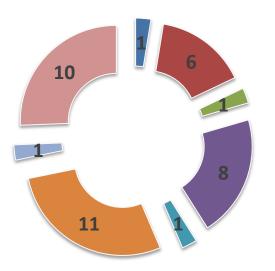
	Settlement Statement Type >	Indicative	Initial
	Settlement Component Name	Settlement Sum Charge Quantity \checkmark	Settlement Sum Charge Quantity
-1	CDISCOUNT	3,937,258.25	3,053,894.39
2	CPREMIUM	3,100,368.83	2,266,734.28
3	CFC	1,690,853.61	240,472.89
4	CABBPO	613,038.85	402,449.35
5	CCURL	41,918.96	-49,602.53
6	CTEST	-288.34	-288.34
7	CCA	-21,622.39	-13,992.37
8	CDIFFCWD	-85,417.91	-118,935.56
9	CUNIMB	-298,194.51	-233,737.86
10	CSOCDIFFP	-304,995.15	-200,771.61
11	CAOOPO	-334,157.99	-340,400.26
12	CREV	-1,008,559.83	-644,834.67
13	CIMB	-3,212,210.05	1,218,180.60
14	CIMP	-7,452,490.26	-4,784,811.37
Tot	al	-3,334,497.94	794,356.95

Spike in PIMB creating a spike in Imbalance Charge and Discount Component

> Note: There were no significant events of difference payments and charges in this period: <u>Difference charges</u> - The strike price was not exceeded by the PIMB and all the within day difference charges collected refer to the use of QBOAs with high BOA Prices. <u>Difference payments</u>- No difference Payments were payed.

Settlements – Formal Queries

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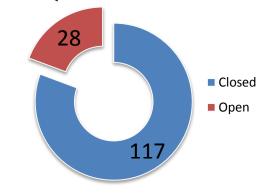


- Capacity Payments
- Difference payments and charges
- Discount Payments
- Discount Payments for non controllable units
- Exchange Rate application
- Fixed Costs Payments and Charges
- Metering
- Uninstructed Imbalance for controllable non dispatchable units

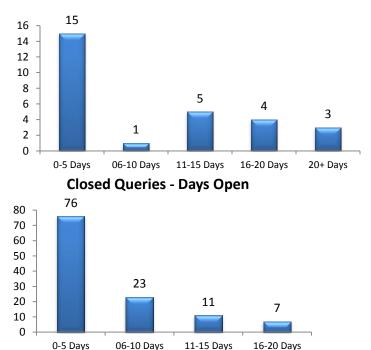
21 completed Formal queries out of a Total of 39 (53%)







Open Queries - Days Open



Settlements – Query Updates

- <u>Fixed Costs:</u> Current logic needs to be modified so that CSB gets the correct complex offer data for when a complex bid has been used for a BOA. Fixes required on both Settlements System (CSB) and upstream Market Systems (MA/MI). Estimated delivery (for testing) from the Vendor is 3rd week of November
- <u>FPN / Controllable Wind (DQ)</u>: Both are related issues in that PN and Availability is not being profiled correctly i.e. the start and end of trading period effective values. Estimated delivery (for testing) from the Vendor is 3rd week of November
- <u>Actual Availability</u>: IP Time Weighted Average calculation of qAA only referencing beginning and end of trading period
- <u>Interconnectors</u>: CIMB, Premium & Discount for IRCU and IEU not using QAO and QAB. Fix delivery date TBC
- <u>Autoproducers</u>: Traded positions of TU units are not being considered for difference payments and charges. Fix delivery date TBC



Settlements – Query Updates (continued)

- <u>Capacity Charges/Payments</u>: CCC, CCP and CSOCDIFFP settlement for NI units not applying the Annual Capacity Exchange rate as per G.1.3.5 & G.1.3.6. Balancing market FX rate incorrect being applied. Vendor Investigation ongoing, Fix delivery date TBC
- Incorrect Registered Capacity used in Capacity Payments: 43 GUs and DSUs affected (in some cases the CCP should be higher and in some cases it should be lower). Fix delivered by Vendor, currently under test
- <u>Currency adjustment charge defect</u>: CCA is not being calculated for Supplier lite windfarms registered as suppliers. CCA should be calculated for all supply units (currently only being charged if QMLF < 0)



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Known Issues Update: Balancing Market (1)

ID	Name	Description	Update
468	Reports appearing empty		Manually published to the SEMO website. Currently a defect in the schema that
		REPT_023: Annual CLAF Report	limits amount of rows in XML report at 999,999, in consideration for D1+ potential scope.
5587	Missing Reports on the new SEMO Website	website. REPT_027, REPT_013	Manual workaround being investigated by SEMO. Fix in D1+ potential scope.
5497	VTOD Soak Times	When retrieving VTOD from the MPI via type 2 or type 3, the SOAK WARM QUANTITY values are incorrect. The values shown are the SOAK HOT QUANTITY values. Please note: the integrity of the VTOD set is unaffected. This is simply an incorrect display in the MPI.	In D1+ potential scope.
5195	Report display	time.	Currently not an issue due to clock change. Permanent fix in D1+ potential scope.



Known Issues Update: Balancing Market (2)

ID	Name	Description	Update
5209	REPT_050 Imbalance Price Supporting Information Report	The report contains duplicates items.	Closed with ITS update to accommodate field.
5575	REPT_050 Imbalance Price Supporting Information Report	The report no longer contains duplicates items (5209) however now contains an undocumented field 'Constraint Id'	Closed with ITS update to accommodate field.
5329	1st ISP of Trade Day	Reports not showing first ISP interval for trade date in report. REPT_078: Aggregated Contract Quantities for Generation REPT_079: Aggregated Contract Quantities for Demand REPT_080: Aggregated Contract Quantities for Wind	EirGrid progressing as a matter of urgency; fix due to be delivered for testing by end November 2018
5641	Incorrect MW values	Incorrect values calculated in REPT_078, 079, 080	EirGrid progressing as a matter of urgency; fix due to be delivered for testing by end November 2018
5603	Anonymized INC	Currently the report cumulatively adds each MW quantity to the last MW quantity rather then the difference. This results in erroneous large MW quantity's being produced by the system	In D1+ potential scope.
93703	Hydro Plant start up/shutdown limits	Hydro plants are experiencing issues with their start/shut down limits.	Closed



Known Issues Update: Settlement (1)

ID	Name	Description	Update
5570	TU units not being charged CRM difference Charges vs GU	The traded positions of TU units are not being considered for difference payments and charges	Closed
5637	Charge	Difference Charge Calculation uses service point instead of account for "charged account id" for autoproducer trading sites - making lookups fails.	Closed
5314		The timestamp attribute in the Value element contains +1 second, which it should not.	Not amongst the highest priority report defects
5322		PUBLICATION_TIMESTAMP attribute is incorrectly assigned the start time of the credit assessment, rather than the finish time.	Not amongst the highest priority report defects
5137	REPT_044	In Report 44 null values for the QABBIAS determinant are present instead of zeros	Closed
5339	REPT_043	Incorrect rounding applied to detail records. Summary and Detail records do not sum correctly.	In D1+ potential scope.



Known Issues Update: Settlement (2)

ID	Name	Description	Updates
5137	REPT_044	In Report 44 null values for the QABBIAS determinant are present instead of zeros	Closed
5339	REPT_043	Incorrect rounding applied to detail records. Summary and Detail records do not sum correctly.	In D1+ potential scope.
5658	REPT_044	Settlement Report is reporting QCOB and QCNET as daily values instead of 30 minute values, the calculation is working as designed using each ISP values in the Settlement calculations.	Not amongst the highest priority report defects
5643	REPT_043	The below charges are not being calculated intermittently in Settlement statement (REPT_043) for some units on different days. CABBPO, CAOOPO, CDISCOUNT, CPREMIUM, CUNIMB	Closed
5322	REPT_048 Collateral Report	PUBLICATION_TIMESTAMP attribute is incorrectly assigned the start time of the credit assessment, rather than the finish time.	Not amongst the highest priority report defects
5658	REPT_044	Settlement Report is reporting QCOB and QCNET as daily values instead of 30 minute values, the calculation is working as designed using each ISP values in the Settlement caluclations.	Not amongst the highest priority report defects



Known Issues Update: Settlement (3)

ID	Name	Description	Update
5757		QFPN being calculated in MMS based on values of FPN profile on each half hour boundary point only and not considering changes in profile within the half hour.	
5657	Generator Units	Biased Quantities are currently being calculated for all generator units which is registered as part of an Autoproducer site.	Not amongst the highest priority report defects
5652	Incorrect result for CIMB for IRCU and IEU units in REPT_043	In REPT_043, the CIMB charge calculation for IRCU and IEU units is incorrect due to missing data.	EirGrid progressing as a matter of urgency; fix due to be delivered for testing by end November 2018
5654	Incorrect result for CDISCOUNT and CPREMIUM for the IRCU unit in REPT_043	In REPT_043, the CPREMIUM & CDISCOUNT charge calculations for the IRCU unit are incorrect due to missing data.	EirGrid progressing as a matter of urgency; fix due to be delivered for testing by end November 2018
5643	Initial Conditions processing for settlement input data	The Initial Conditions calculations logic in Instruction Profiling/QBOA is not properly handling all scenarios for all units for the first interval of the day. Subsequently, the necessary data for producing a complete and accurate Settlement Statement (REPT_043) are not calculated or sent to CSB. As a result, the CABBPO, CAOOPO, CDISCOUNT, CPREMIUM, and CUNIMB charge types are missing for units in the first interval in the day).	Closed



Known Issues Update – SEMOpx

ID	Name	Description	Update
		Message log is not retaining the message indicating availability of the ETS Auction Results.	tbc
	Curves Report	Bid/Ask Curves report fails to generate following an auction, for a given jurisdiction, when there are no orders received for that auction.	tbc

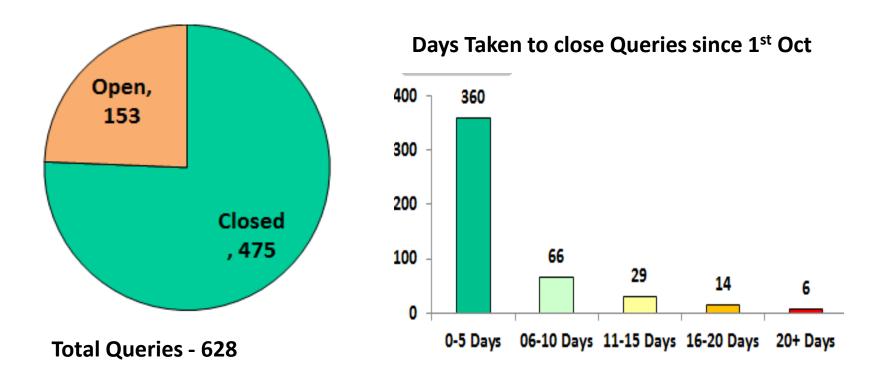


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Disputes - Repricing and Resettlement Update	David Carrol	
Settlements & Funds Transfer	Sean O'Rourke, John O'Dea	
Pre Go-Live Known Issues Update	Jonathan Jennings	
Query Management	Claire Breslin	
Q&A		



Query Status – From Oct 2018





Formal Queries and Disputes – From Oct 2018

Disputes

- o Open 1
- Referred to DRB 3
- Resolved 20

Settlement Queries

- o **Open 20**
- Completed 21

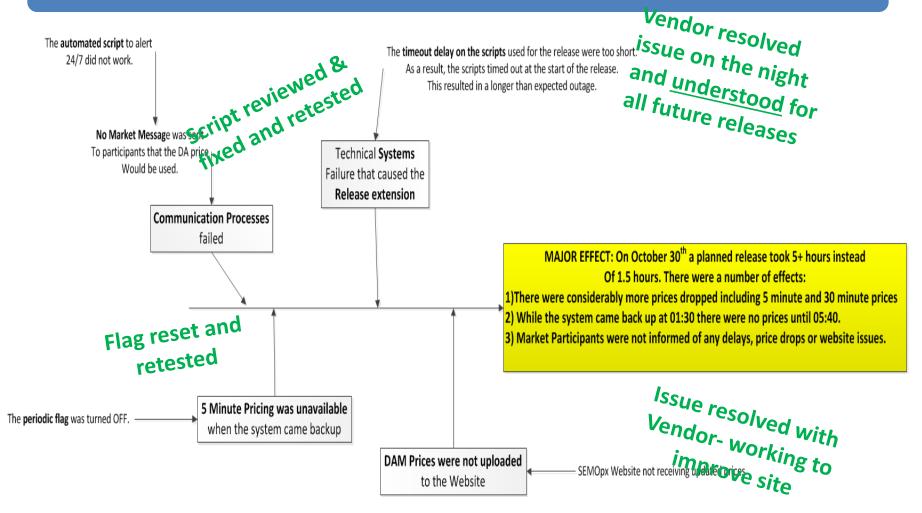


Agenda

Item	Presenter	
Welcome	Simon Grimes	
Ex-Ante Market	Liam McAllister	
Balancing Market	Aodhagan Downey, Sam Matthews, Brendan Ring	
Disputes - Repricing and Resettlement Update	David Carrol	
Settlements & Funds Transfer	Sean O'Rourke, John O'Dea	
Pre Go-Live Known Issues Update	Jonathan Jennings	
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Q&A		



Oct 30th Root Cause Analysis





Close

- SEMO Website: <u>http://www.sem-o.com/</u>
- Semopx Website: <u>http://www.semopx.com/</u>
- Queries: <u>Info@sem-o.com</u>; <u>Info@semopx.com</u>

Thank you for your attendance.

