Test report for Grid Loss shadow calculations

EMCC
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Management summary

- EMCC implemented the Grid Loss functionality on Baltic Cable (SE4⇔GER) on the 12th of October.
- The PXs and some cable owner asked for an analyses of the impact of the Grid Loss functionality on the other interconnectors and price areas within the ITVC region.
- It was decided to do shadow calculations with switched off Grid Loss functionality of each production day within a period of 4 weeks
- Due to the fact that the Baltic cable was out of operation between 05.11.2012-19.11.2012 the shadow auctions were stopped on the 5th of November. The long clock change day was not taken into consideration.
- The change between the shadow calculations performed in the simulation environment and the production run is the Grid Loss functionality. The OBKs are the same. The shadow calculation doesn't include the purchase order which Baltic Cable would have given to the market in order to cover the grid losses.

Result:

- A number of all together 552 hours was taken into consideration.
- The tests have shown the following average price deviation between EMCC with Grid Loss (production) and the shadow calculation in EMCC MC system without Grid Loss:

	DK1	DK2	SE4	GER	NL	NO2
Average (prod)	36,98	37,09	35,21	42,36	51,45	35,37
Average (shadow)	37,01	37,13	35,22	42,34	51,46	35,38
deviation	0,03 €	0,03 €	0,01 €	-0,02 €	0,01 €	0,01 €

Test description

Aim:

- The shadow calculations in the EMCC simulation system should show the calculation results without Grid Loss functionality on Baltic Cable in comparison to the calculation results with the Grid Loss functionality on Baltic Cable from production.
- It was expected that flows on the ITVC interconnectors as well as the prices in the ITVC areas should change.

Configuration:

- After each production run the original input files (ATC/OC files; OBK files and LHF values) were uploaded in the EMCC Simulation MC system.
- The Grid Loss functionally on Baltic Cable was switched off for the shadow calculation.
- The EMCC prices of all real areas of the shadow calculation were compared with the EMCC prices of the respective production run.
- The flows on DK1-GER, DK2-GER, SE4-GER and NO2-NL interconnection were also compared between the run with and without Grid Loss.

Calculation date from production: 12.10. – 05.11.2012

Results - prices

Prices:

Both the impact on the minimum-prices, maximum-prices, the minimum and the maximum price deviation and on the average prices has been checked.

The price deviation between EMCC MC system with Grid Loss functionality and the simulation system without Grid Loss functionality are as follows:

prices																	
area	DK1	DK2	SE4	GER	NL	NO2	SE1	SE2	SE3	NO1	NO3	NO4	NO5	FRA	BEL	FIN	EST
Min (prod)	10,98 €	10,98 €	21,05 €	10,09 €	21,58 €	21,58 €	21,05 €	21,05 €	21,05 €	21,58 €	28,68 €	28,68 €	21,58 €	10,09 €	21,58 €	21,05 €	21,37 €
Min (shadow)	10,98 €	10,98 €	21,05 €	10,09 €	21,56 €	21,56 €	21,05 €	21,05 €	21,05 €	21,56 €	28,68 €	28,68 €	21,56 €	10,09 €	21,56 €	21,05 €	21,30 €
deviation	0,00 €	0,00 €	0,00 €	0,00 €	-0,02 €	-0,02 €	0,00 €	0,00 €	0,00 €	-0,02 €	0,00 €	0,00 €	-0,02 €	0,00 €	-0,02 €	0,00 €	-0,07 €
Max (prod)	73,88 €	73,88 €	59,13 €	105,49 €	120,00 €	43,77 €	43,77 €	43,77 €	43,77 €	43,77 €	43,77 €	43,75 €	43,77 €	105,49 €	120,00 €	74,61 €	62,35 €
Max (shadow)	74,12 €	74,12 €	59,13 €	108,11 €	120,00 €	43,77 €	43,77 €	43,77 €	43,77 €	43,77 €	43,77 €	43,75 €	43,77 €	108,11 €	120,00 €	74,61 €	62,35 €
deviation	0,24 €	0,24 €	0,00 €	2,62 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	2,62 €	0,00 €	0,00 €	0,00 €
Average (prod)	36,98	37,09	35,21	42,36	51,45	35,37	35,15	35,15	35,15	35,37	35,60	35,04	35,37	46,32	52,09	37,79	39,18
Average (shadow)	37,01	37,13	35,22	42,34	51,46	35,38	35,16	35,16	35,16	35,38	35,61	35,04	35,38	46,33	52,10	37,79	39,18
deviation	0,03 €	0,03 €	0,01 €	-0,02 €	0,01 €	0,01 €	0,01 €	0,01 €	0,01 €	0,01 €	0,01 €	0,00 €	0,01 €	0,01 €	0,02 €	0,00 €	0,01 €
price deviation																	
area	DK1	DK2	SE4	GER	NL	NO2	SE1	SE2	SE3	NO1	NO3	NO4	NO5	FRA	BEL	FIN	EST
Min	-9,80 €	-9,80 €	-0,45 €	-2,62 €	-3,73 €	-0,45 €	-0,45 €	-0,45 €	-0,45 €	-0,45 €	-0,45 €	-0,45 €	-0,45 €	-2,62 €	-3,73 €	-0,45 €	-0,45 €
Max	6,51 €	6,51 €	0,54 €	1,92 €	0,88 €	0,26 €	0,54 €	0,54 €	0,54 €	0,26 €	0,26 €	1,00 €	0,26 €	1,00 €	0,88 €	0,23 €	0,23 €
average	-0,03 €	-0,03 €	-0,01 €	0,02 €	-0,01 €	-0,01 €	-0,01 €	-0,01 €	-0,01 €	-0,01 €	-0,01 €	0,00 €	-0,01 €	-0,01 €	-0,02 €	0,00 €	-0,01 €
average of absolute values	0,10 €	0,09 €	0,03 €	0,09 €	0,03 €	0,02 €	0,03 €	0,03 €	0,03 €	0,02 €	0,02 €	0,02 €	0,02 €	0,05 €	0,03 €	0,02 €	0,01 €

Results - flows

Flows:

It was known from theory and from tests before the launch that the Grid Loss mechanism shifts under special circumstances volume from interconnectors with Grid Loss functionality to interconnectors without Grid Loss functionality. This has been proven by the test results again.

The flow deviation between EMCC MC system with Grid Loss functionality and the simulation system without Grid Loss functionality are as follows:

flows (MW)								
	DK1->GER	GER->DK1	DK2->GER	GER->DK2	SE4->GER	GER->SE4	NO2->NL	NL->NO2
Min (prod)	0	0	0	0	0	0	0	0
Min (shadow)	0	0	0	0	0	0	0	0
Max (prod)	1.780	1.500	585	600	610	600	700	514
Max (shadow)	1.780	1.500	585	600	610	600	700	514
Sum (prod)	413.935	109.415	170.420	64.313	115.038	20.741	354.716	3.869
Sum (shadow)	403.054	98.851	161.231	61.464	149.097	38.432	355.167	3.514
Deviation of sum	10.881	10.564	9.189	2.850	-34.059	-17.691	-451	355
Dev in %	2,63	9,65	5,39	4,43	-29,61	-85,29	-0,13	9,16

Consideration on results

Results:

- With Grid Loss in 159 out of 552 hours there was no flow calculated on Baltic Cable.
- Without Grid Loss in 27 hours there was no flow calculated on Baltic Cable.
- The average price in GE (including Grid Loss) was 0,02 € higher than without Grid Loss. This can be explained by the fact that the import to Germany was reduced by the Grid Loss volume and by more hours without flow.
- The average price in SE4 (including Grid Loss) was 0,01 € lower than without Grid Loss. This can be explained by the fact that there were less hours with flow from SE4 to GE. So the purchased volume was reduced while the offered volume remained the same.