



Transelectrica®
Societate Administrată în Sistem Dualist

MARKET MONITORING REPORT

Balancing Market

May 2023

ANRE - Romanian Energy Regulatory Authority
HHI - Herfindahl-Hirschman Index
BRP - Balance Responsible Party
BM - Balancing Market
DAM - Day Ahead Market
TSO - Transmission System Operator
DU – Dispatchable Unit
PN – Physical Notification
NDC - National Dispatching Center
C1 – The market share of the largest market participant
C3 – Total market share of top 3 market participants
NPS – Minimum number of residual generators
TTC – Total Transfer Capacity
NTC – Net Transfer Capacity
ATC – Available Transfer Capacity
NRA – National Regulatory Authority

According to the Commercial Code, Transelectrica, the Romanian Transmission System Operator, operates and monitors the activity of 3 types of markets: Balancing Market, Ancillary Services Market and Market for Allocation of Cross-Border Capacities.

Using the records from the markets data bases, Transelectrica prepares daily, weekly and monthly monitoring reports. A part of the data included in these reports (those data which are not confidential) are published on the website www.transelectrica.ro (section Transparency).



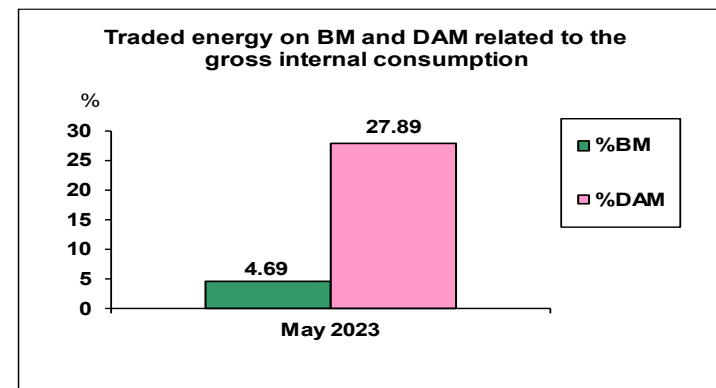
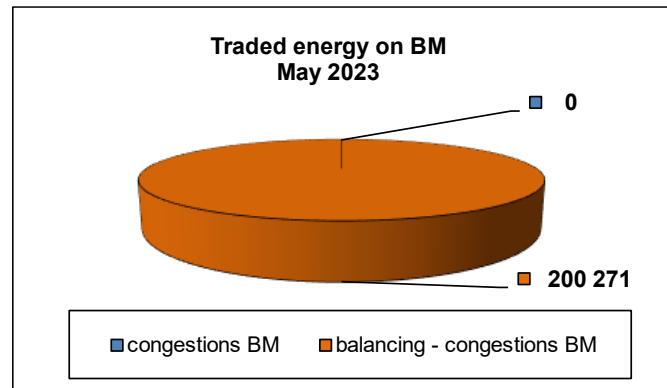
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Balancing Market

The Balance Generation/Consumption

- The average monthly value of generated power was 6 165 MW and the actual internal gross consumption was 5 734 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being **2.53%**. Bigger differences were registered in case of consumption values resulted as the sum between notified production and total scheduled exchanges with the neighbouring power systems. In this case the standard monthly deviation value was **8.37%**. The greatest daily deviation regarding the notifications was registered on 21st of May (**17.93%**).
- The energy used in May 2023 for balancing the power system and congestion management was 200 271 MWh (with an average power of 269 MW, which means **4.69%** from the internal gross consumption).
- There was no energy used for congestion management.
- The energy used corresponding to transactions outside BM (with financial compensation) was 3 436 MWh (with an average power of 5 MW, which means 0.08% from the internal gross consumption). There were no selections on congestion that would lead to costs, as it results after applying the costing algorithm for balancing the system and for the management of internal congestions in the settlement stage on the balancing market.
- The energy used in May 2023 on Day Ahead Market was de 1 189 662 MWh (with an average power of 1 599 MW, which means 27.89% from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 80 076 953 lei (with an average weighted price of 399.84 lei/MWh).
- The value of transactions outside BM (with financial compensation) was -14 919 lei (with an average weighted price of -4.34 lei/MWh)





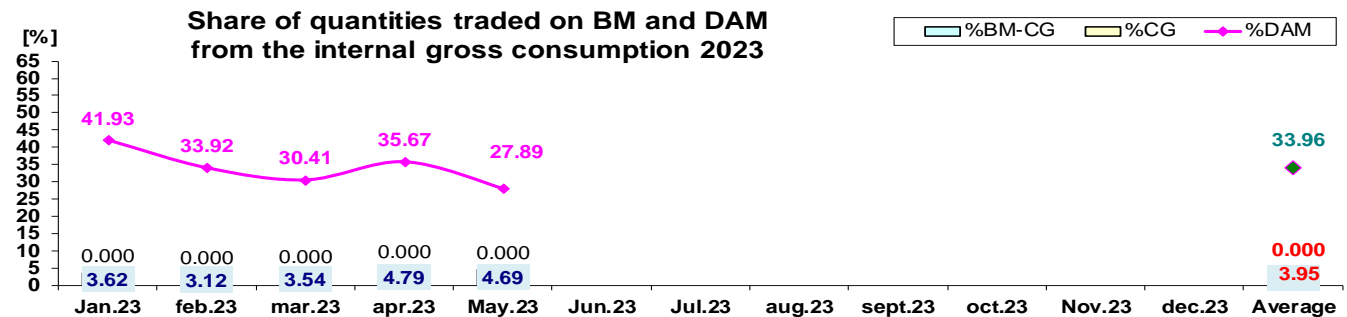
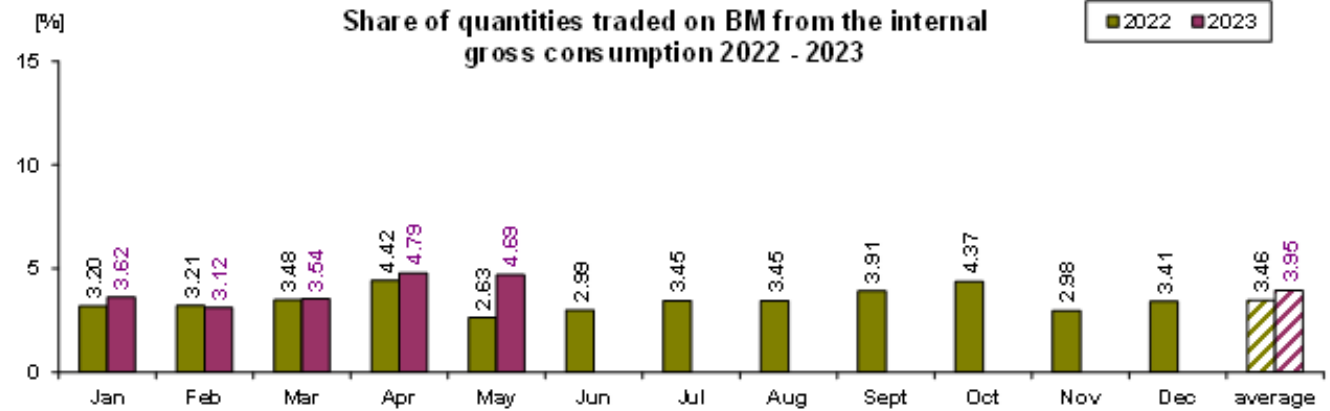
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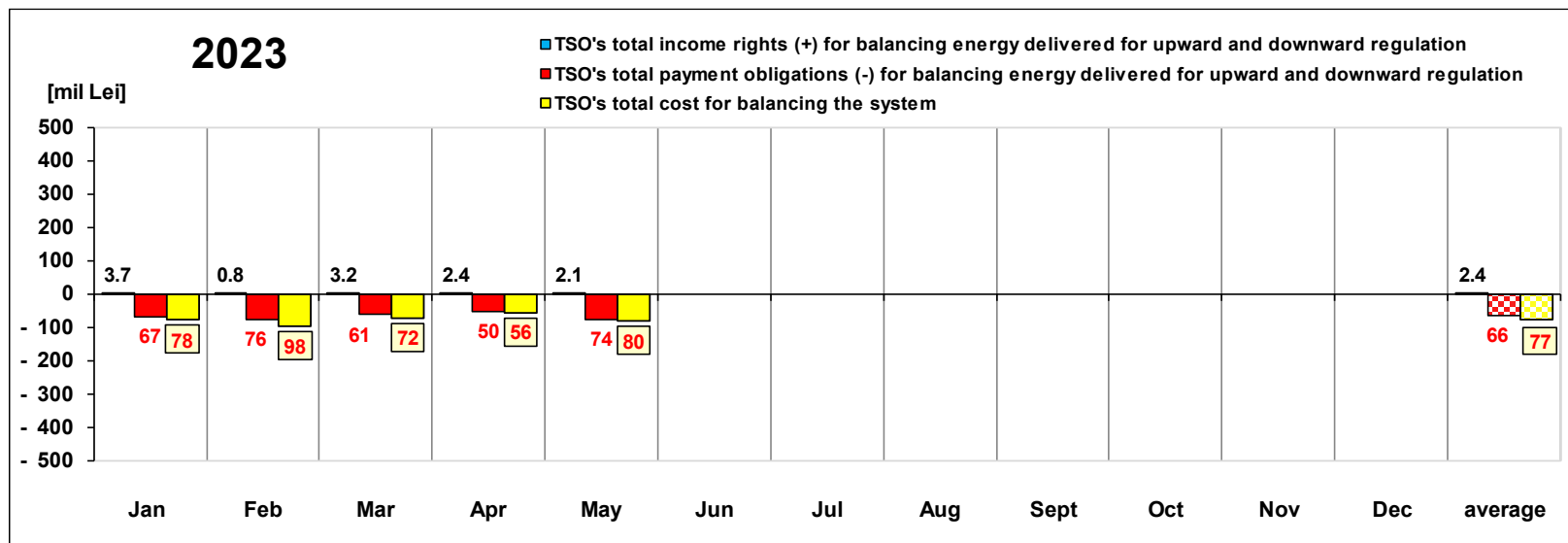
The Balance Generation / Consumption

• Monthly percentage values resulted are calculated as ratio between traded volumes on BM / outside BM with financial compensation and gross internal consumption. The annual average value was calculated as average of monthly values. (BM – Balancing Market, DAM – Day Ahead Market, BM-CG – difference between Balancing Market and traded volume on congestion).



	2023												
	Jan.23	feb.23	mar.23	apr.23	May.23	Jun.23	Jul.23	aug.23	sept.23	oct.23	Nov.23	dec.23	Average
%BM	3.62	3.12	3.54	4.79	4.69								3.95
%DAM	41.93	33.92	30.41	35.67	27.89								33.96
%CG	0.000	0.000	0.000	0.000	0.000								0.000
%BM-CG	3.620	3.117	3.538	4.785	4.694								3.951
% outside BM	0.00	0.00	0.00	0.00	0.08								0.02

Balancing Energy Market Transactions



[Lei]	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	average	Sum
TSO's income rights / payment obligations for balancing energy delivered for downward regulation	incomes (+) prices ≥ 0	3 671 254	764 288	3 191 826	2 401 619	2 148 297							2 435 457	12 177 284
	payments (-) prices < 0	-18 058 105	-13 750 607	-2 780 494	-2 350 152	-47 431 536							-16 874 179	- 84 370 894
TSO's payment obligations / income rights for balancing energy delivered for upward regulation	payments (-) prices ≥ 0	-48 959 475	-62 157 235	-57 883 797	-47 817 479	-27 021 006							-48 767 798	- 243 838 991
	incomes (+) prices < 0	0	0	0	0	0							0	0
TSO's total income rights (+) for balancing		3 671 254	764 288	3 191 826	2 401 619	2 148 297							2 435 457	12 177 284
TSO's total payment obligations (-) for		-67 017 580	-75 907 841	-60 664 291	-50 167 631	-74 452 541							-65 641 977	- 328 209 884
TSO's total cost for balancing the system		-78 018 832	-97 917 681	-71 922 686	-55 930 994	-80 062 808							-76 770 600	- 383 853 001
Value of transactions outside BM (with		0	0	0	- 66 398	- 14 919							- 16 263	- 81 317
Congestion Cost on BM		0	0	0	0	0							0	0
Congestion Cost outside BM		0	0	0	- 88 286	0							- 17 657	- 88 286

* The annual average value was obtained as arithmetic average of the monthly values.

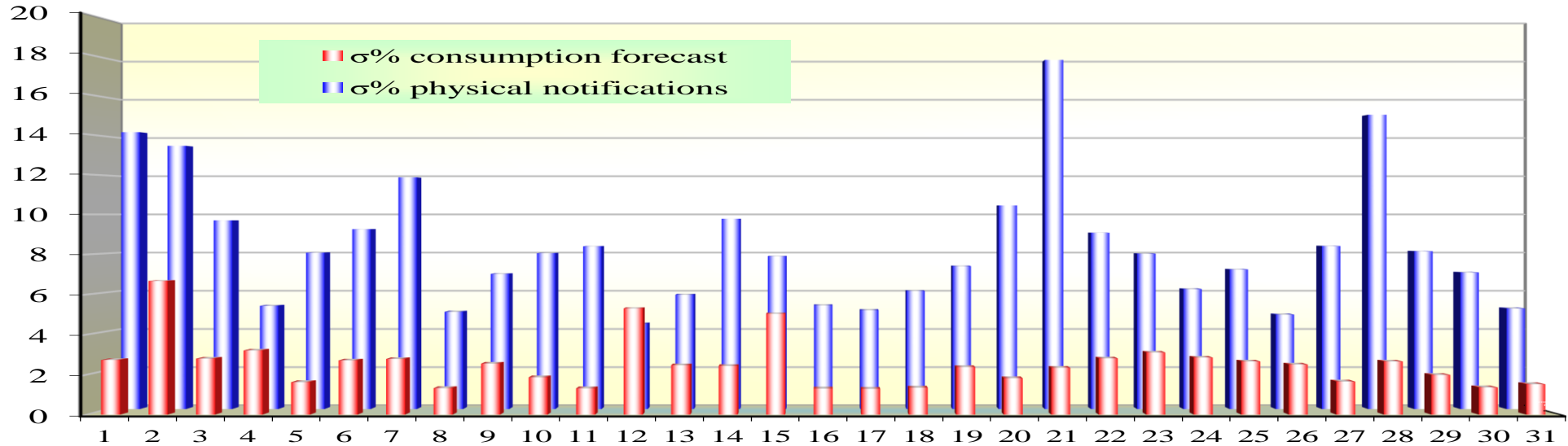


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Balancing Market

Standard deviation of physical notifications and consumption forecast against the actual consumption in May 2023



May 2023

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
σ% consumption forecast	2.73	6.68	2.80	3.21	1.62	2.71	2.78	1.32	2.55	1.86	1.31	5.31	2.47	2.43	5.04	1.30	1.29	1.35	2.38	1.82	2.34	2.81	3.11	2.85	2.66	2.51	1.65	2.65	1.98	1.36	1.52
σ% physical notifications	14.23	13.52	9.69	5.30	8.03	9.24	11.90	5.00	6.94	8.00	8.36	4.38	5.87	9.78	7.85	5.33	5.08	6.06	7.34	10.46	17.93	9.06	7.98	6.16	7.17	4.85	8.38	15.12	8.11	7.02	5.17

σ_{average% consumption forecast} = 2.53

σ_{average % physical notifications} = 8.37

$$\sigma_{average\%consumptionforecast} = \sqrt{\frac{\frac{1}{n} \sum_{i=1}^n (R - P)^2}{\bar{R}}} \cdot 100$$

$$\sigma_{average\%notifications} = \sqrt{\frac{\frac{1}{n} \sum_{i=1}^n (R - N)^2}{\bar{R}}} \cdot 100$$

R = Realized Consumption;

N = Physical Notifications;

P = Consumption Forecast.

Public



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Balancing Market

Balancing energy – Selected prices and quantities

- At the beginning of the month on the Balancing Market operated 80 BRPs, 91 market participants, holding 180 commercially operating dispatchable units. Starting with 1st of May, dispatchable production unit UAG ARAD having as owner BMP AOT ENERGY (30XROAOTER-----V) was registered to the balancing market platform and non-dispatchable production unit AGGREKO was removed from the balancing market platform. According to NRA Order no 213/2020, with subsequent amendments and completions, the following BRPs entered BM:
 - ✓ KEK HAL (PROBE) (30XROKEKHAL----S) (18.05) for production unit KEKHAL_PROBE;
 - ✓ MIO SOLAR POWER (PROBE)(30XROMIOSOLARP-H) (18.05) for production unit MIOSOLAR_PROBE;
 - ✓ CHESHAM SOLAR (PROBE) (30XROCHESHAMSOLF) (24.05) for production units CALAFAT1_PROBE și CALAFAT2_PROBE;
 - ✓ CONTI GREEN PROJECTS (PROBE) (30XROCONTIGREENI) (24.05) for production unit FRASINET_PROBE;
 - ✓ UNIREA GREEN ENERGY (PROBE) (30XRO-UGE-PROBEH) (24.05) for production unit ULMU2_PROBE.

May 2023

Downward Regulation

Downward Regulation	Prices			Quantities			Participants						
	Weighted Average	Maximum	Minimum	Selected	Actually Delivered	Deviation		C1	C3	C1	C3	HHI	HHI
	[lei/MWh]	[lei/MWh]	[lei/MWh]	[MWh]	[MWh]	[%]	Number	(selected)	(actually delivered)	(selected)	(selected)	(actually delivered)	
Secondary	0.10	0.10	0.10	35321.43	35321.43	0.00%	2	73.88%	100%	73.88%	100%	6140	6140
Fast Tertiary	-304.02	90.10	-10000.00	151282.07	145927.12	3.54%	18	47.03%	94.45%	46.46%	94.55%	4285	4298
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-	-
				186603.49	181248.55	2.87%							

Upward Regulation

	Prices			Quantities			Participants						
	Weighted Average	Maximum	Minimum	Selected	Actually Delivered	Deviation		C1	C3	C1	C3	HHI	HHI
	[lei/MWh]	[lei/MWh]	[lei/MWh]	[MWh]	[MWh]	[%]	Number	(selected)	(actually delivered)	(selected)	(selected)	(actually delivered)	
Secondary	1918.47	2000.00	802.20	9592.62	9592.62	0.00%	2	73.49%	100%	73.49%	100%	6104	6104
Fast Tertiary	913.22	1337.92	90.00	9651.72	9430.00	2.30%	7	80.36%	93.96%	80.63%	93.96%	6593	6635
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-	-
				19244.34	19022.62	1.15%							

May 2023

Downward Regulation

	Quantities outside BM (with financial compensation)			Participants
	Selected	Actually Delivered	Undelivered	Number
	[MWh]	[MWh]	[%]	
Fast Tertiary	3550.21	3436.41	0.03	6

Public



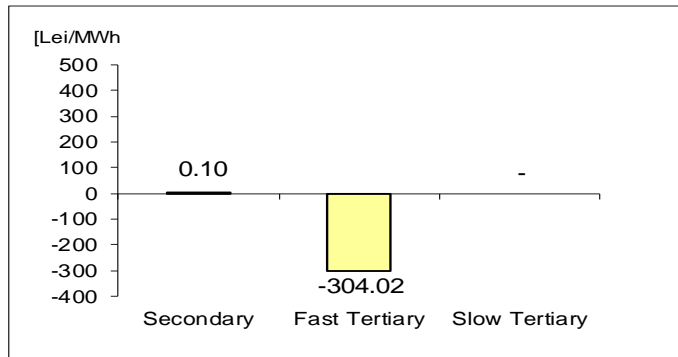
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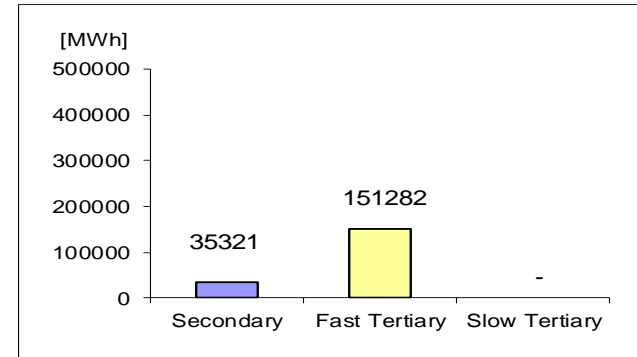
Balancing energy – Selected prices and quantities in May 2023

May 2023

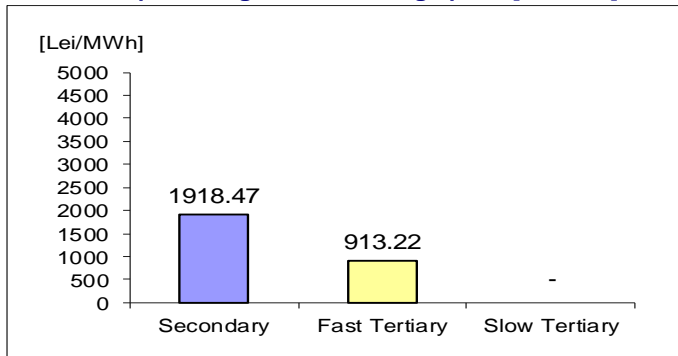
Downward regulation - average price [lei/MWh]



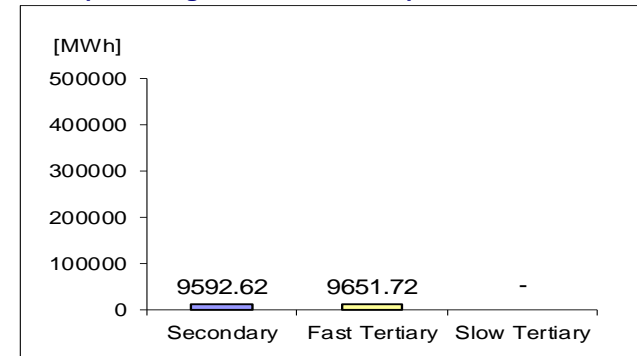
Downward regulation - selected quantities



Upward regulation - average price [lei/MWh]



Upward regulation - selected quantities



$$\text{Price}_{\text{average weighted, regulation type, direction}} = \frac{\sum (Q_{i,j} * P_{i,j})}{\sum Q_{i,j}}$$

where $Q_{i,j}$, $P_{i,j}$ represents the quantity, respectively the price of the energy selected, corresponding to the selected transaction j in the dispatching interval i .

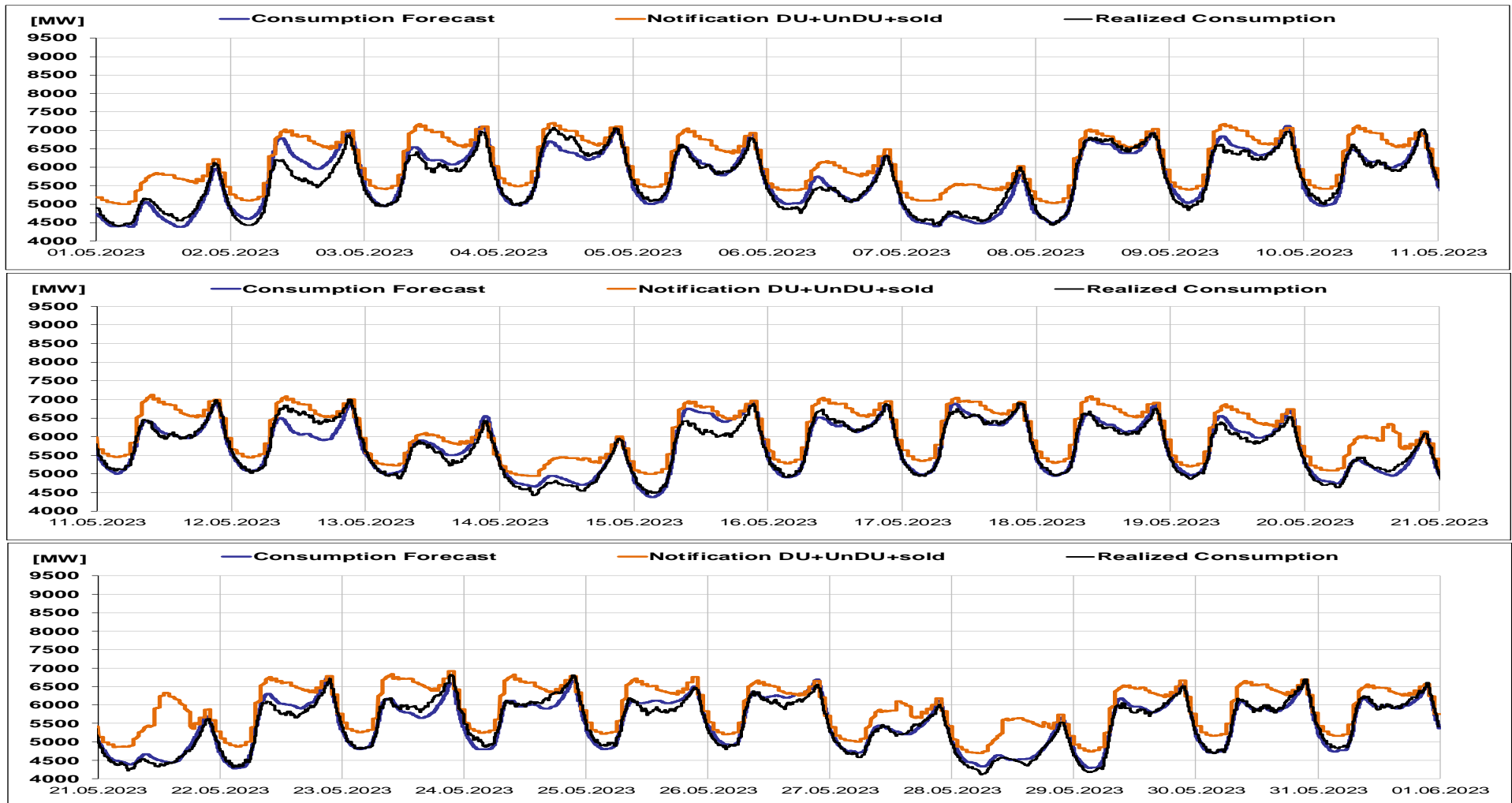


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Realized consumption, forecast, notifications in D-1



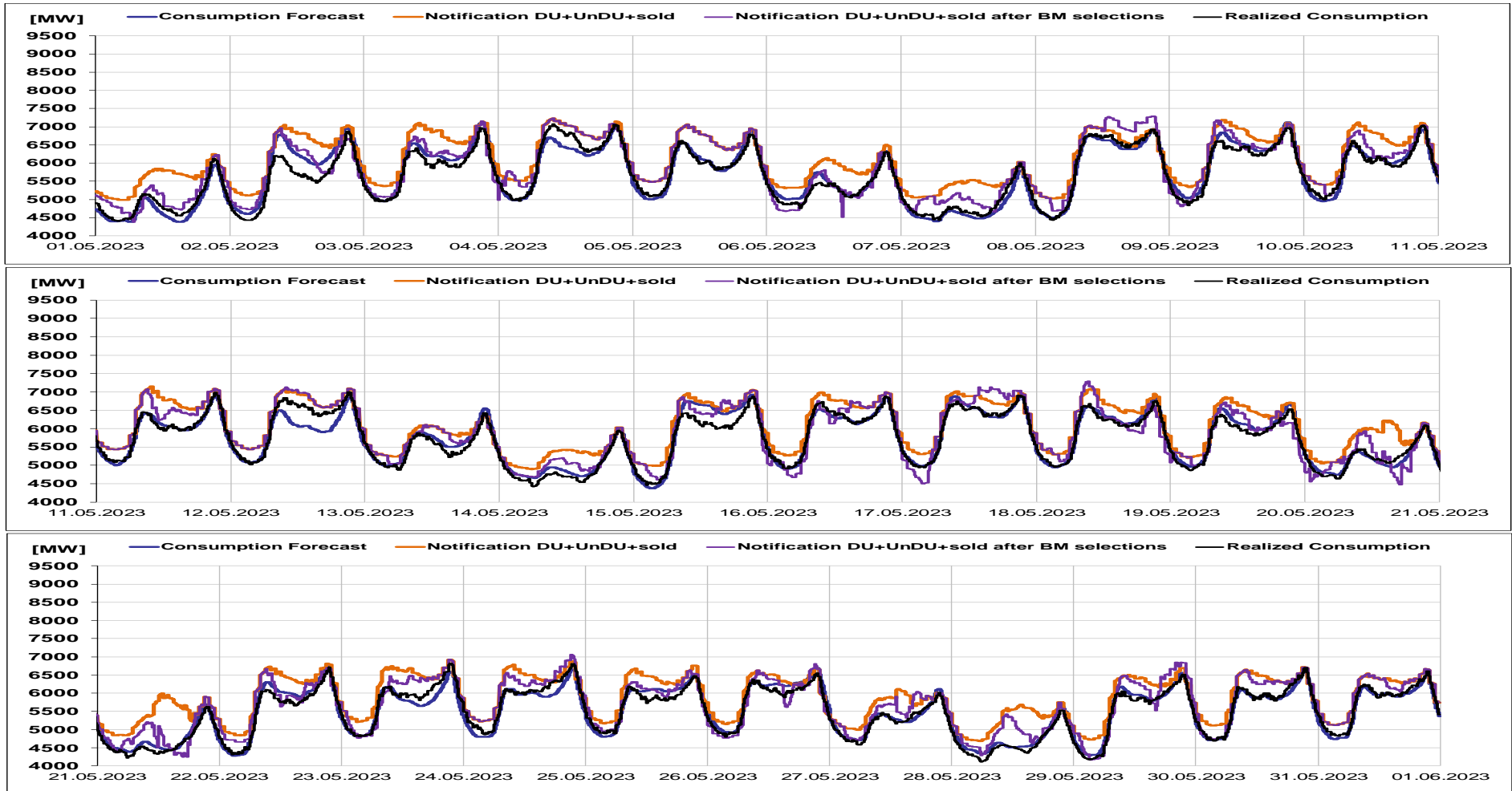


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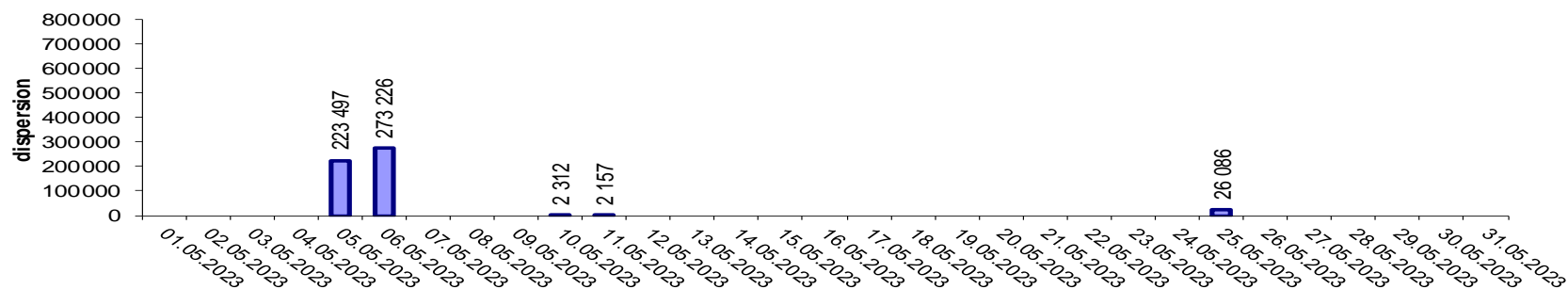
Realized consumption, forecast, notifications, notifications after BM selections in D (end of delivery day)



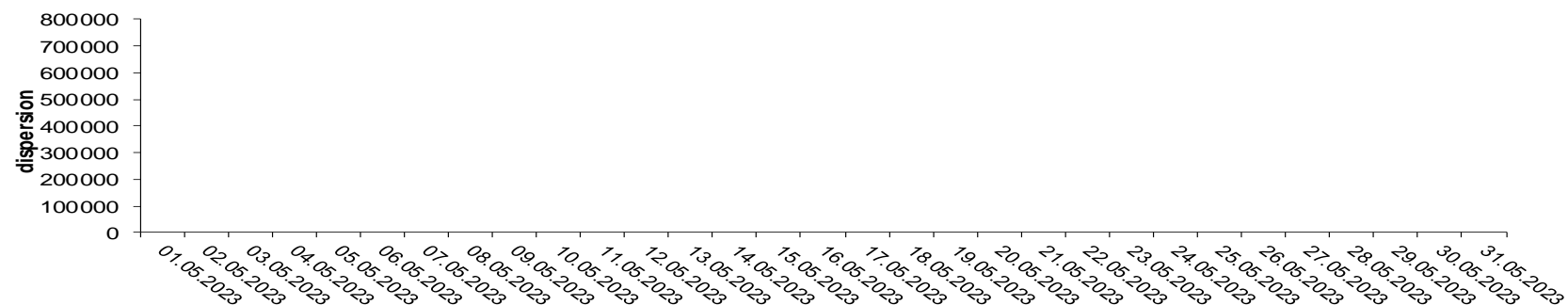
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Indicators – Price Volatility for Secondary Regulation

Price Volatility for Secondary Upward Regulation



Price Volatility for Secondary Downward Regulation



Volatility = price dispersion on studied interval:

$$\frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2$$



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