



Transelectrica®
Societate Administrată în Sistem Dualist

MARKET MONITORING REPORT

Balancing Market

November 2022

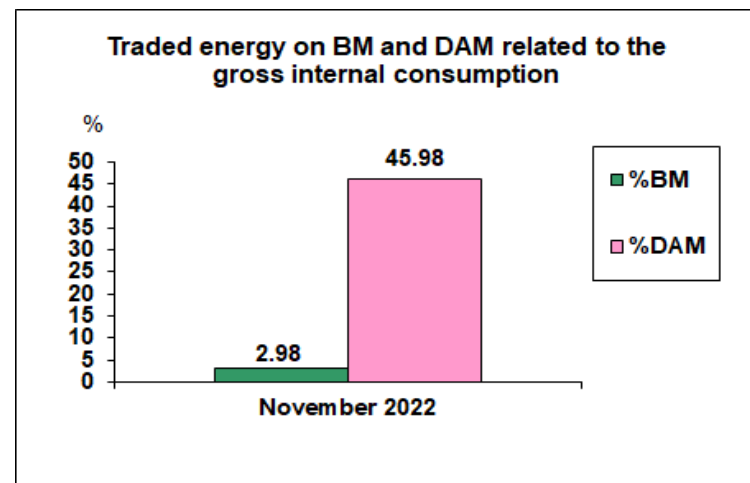
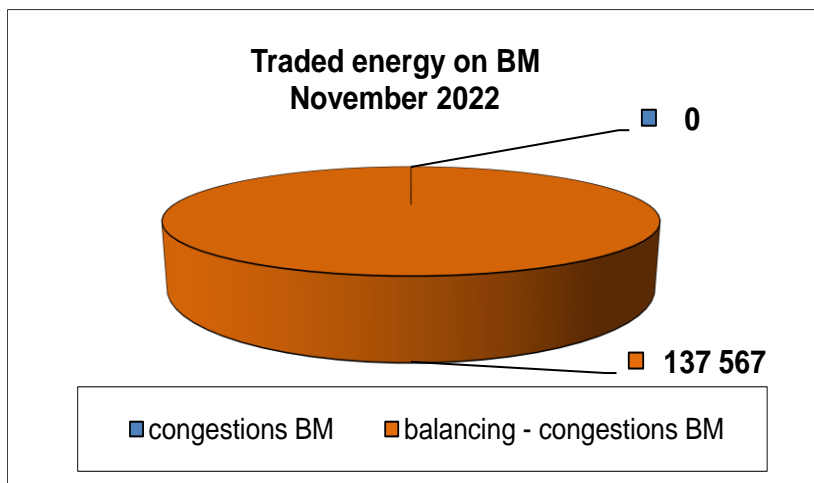
ANRE - Romanian Energy Regulatory Authority
HHI - Herfindahl-Hirschman Index
BRP - Balance Responsible Party
BM - Balancing Market
BMP – Balancing Market Participant
DAM - Day Ahead Market
TSO - Transmission System Operator
DU – Dispatchable Unit
PN – Physical Notification
NDC - National Dispatching 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).

The Balance Generation/Consumption

- The average monthly value of generated power was de 6 481 MW and the actual internal gross consumption was 6 418 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being **1.64%**. 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 **3.65%**. The greatest daily deviation regarding the notifications was registered on the 6th of November (**6.05%**).
- The energy used in November 2022 for balancing the power system and congestion management was 137 567 MWh (with an average power of 191 MW, which means **2.98%** from the internal gross consumption).
- There were no transactions for congestion management nor outside BM (with financial compensation).
- The energy used in November 2022 on Day Ahead Market was de 2 124 844 MWh (with an average power of 2 951 MW, which means **45.98%** from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 100 175 704 lei (with an average weighted price of 728.19 lei/MWh).





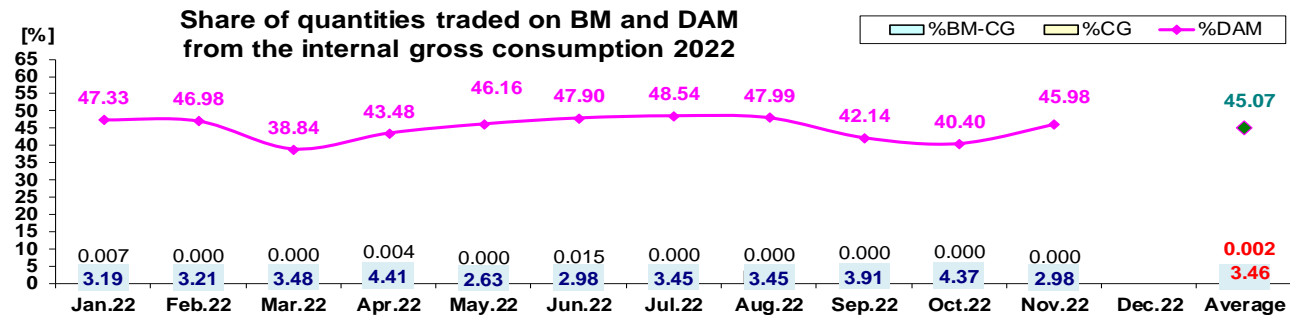
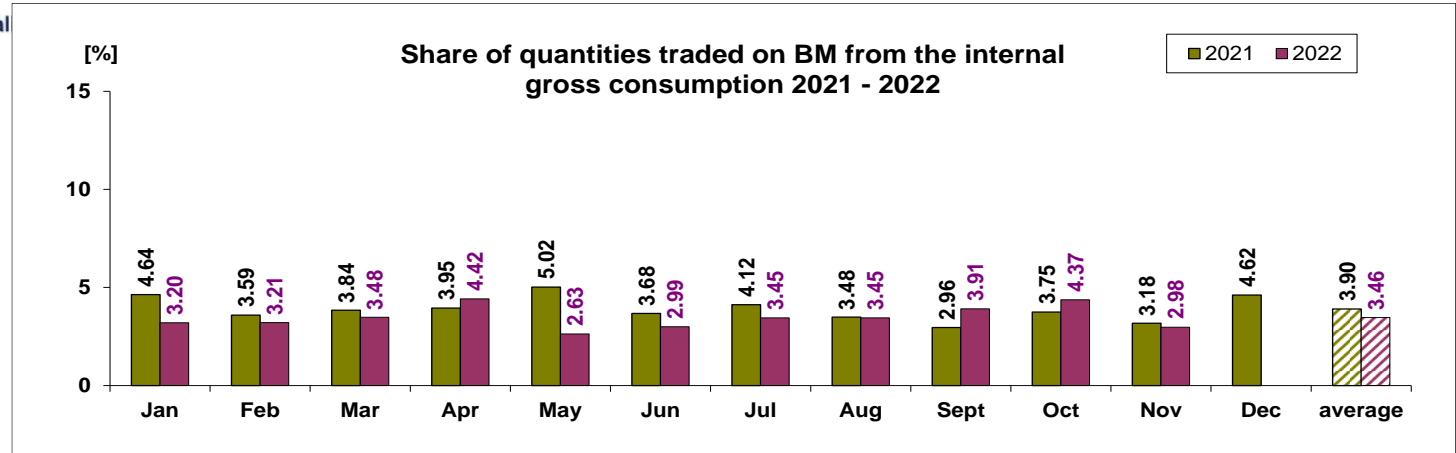
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Balancing Market

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).



2022													
	Jan.22	Feb.22	Mar.22	Apr.22	May.22	Jun.22	Jul.22	Aug.22	Sep.22	Oct.22	Nov.22	Dec.22	Average
%BM	3.20	3.21	3.48	4.42	2.63	2.99	3.45	3.45	3.91	4.37	2.98		3.46
%DAM	47.33	46.98	38.84	43.48	46.16	47.90	48.54	47.99	42.14	40.40	45.98		45.07
%CG	0.007	0.000	0.000	0.004	0.000	0.015	0.000	0.000	0.000	0.000	0.000		0.0024
%BM-CG	3.191	3.206	3.479	4.412	2.631	2.979	3.452	3.448	3.912	4.374	2.977		3.460
% outside BM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00		0.00

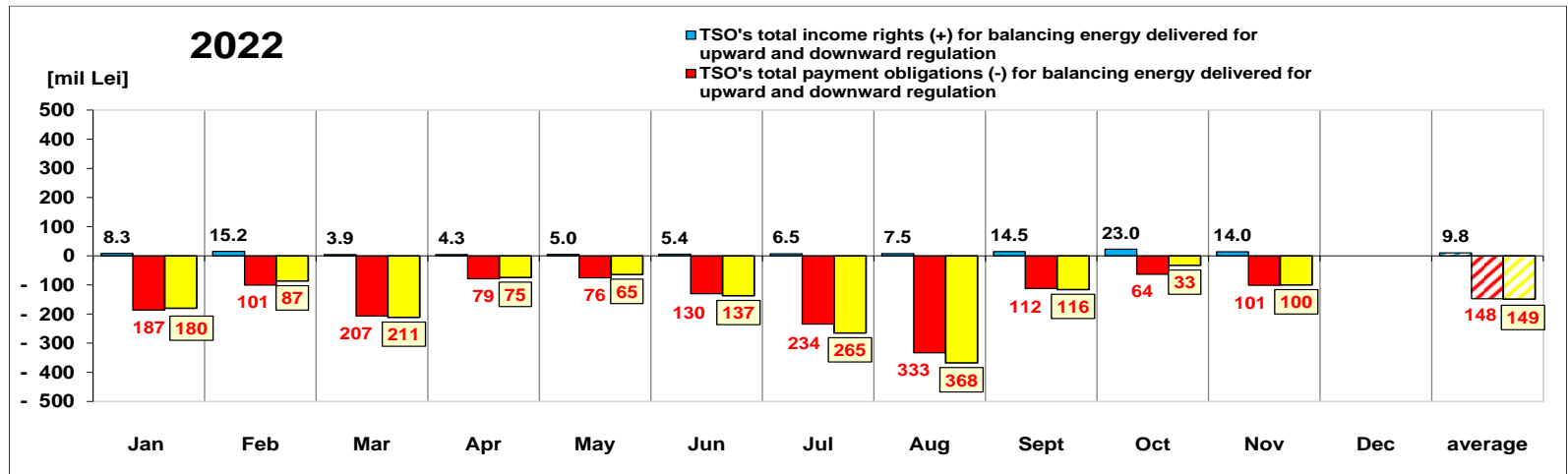
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Balancing Energy Market Transactions



[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	8 344 244	15 164 350	3 932 020	4 322 327	4 990 345	5 393 527	6 457 040	7 512 705	14 481 440	22 974 485	14 045 228		9 783 428	107 617 710
payments (-) prices < 0	- 40 999	- 12 132	- 96 136	- 131 045	- 1 648	- 22 991	- 374	- 15 549	- 3 839	-11 358 266	0		-1 062 089	-11 682 979
TSO's payment obligations / income rights for balancing energy delivered for upward regulation														
payments (-) prices ≥ 0	-186 598 444	-100 703 503	-206 992 197	-78 969 465	-75 510 505	-130 258 379	-234 452 122	-333 300 725	-112 433 467	-52 168 199	-101 285 353		-146 606 578	-1612 672 359
incomes (+) prices < 0	0	0	0	0	0	0	0	0	0	0	0		0	0
TSO's total income rights (+) for balancing energy delivered for	8 344 244	15 164 350	3 932 020	4 322 327	4 990 345	5 393 527	6 457 040	7 512 705	14 481 440	22 974 485	14 045 228		9 783 428	107 617 710
TSO's total payment obligations (-) for balancing energy delivered for	-186 639 443	-100 715 635	-207 088 333	-79 100 510	-75 512 153	-130 281 369	-234 452 496	-333 316 275	-112 437 306	-63 526 465	-101 285 353		-147 668 667	-1624 355 338
TSO's total cost for balancing the system	-180 209 876	-86 965 620	-211 125 690	-74 719 809	-64 511 950	-136 923 991	-265 197 031	-367 812 338	-115 809 867	-32 879 664	-100 175 704		-148 757 413	-1636 331 541
Value of transactions outside BM (with financial	0	0	0	0	0	0	0	0	0	0	0		0	0
Congestion Cost on BM	- 157 055	0	- 3 224	- 30 924	0	- 29 640	0	0	0	0	0		- 20 077	- 220 843
Congestion Cost outside BM	0	0	0	0	0	0	0	0	0	0	0		0	0

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

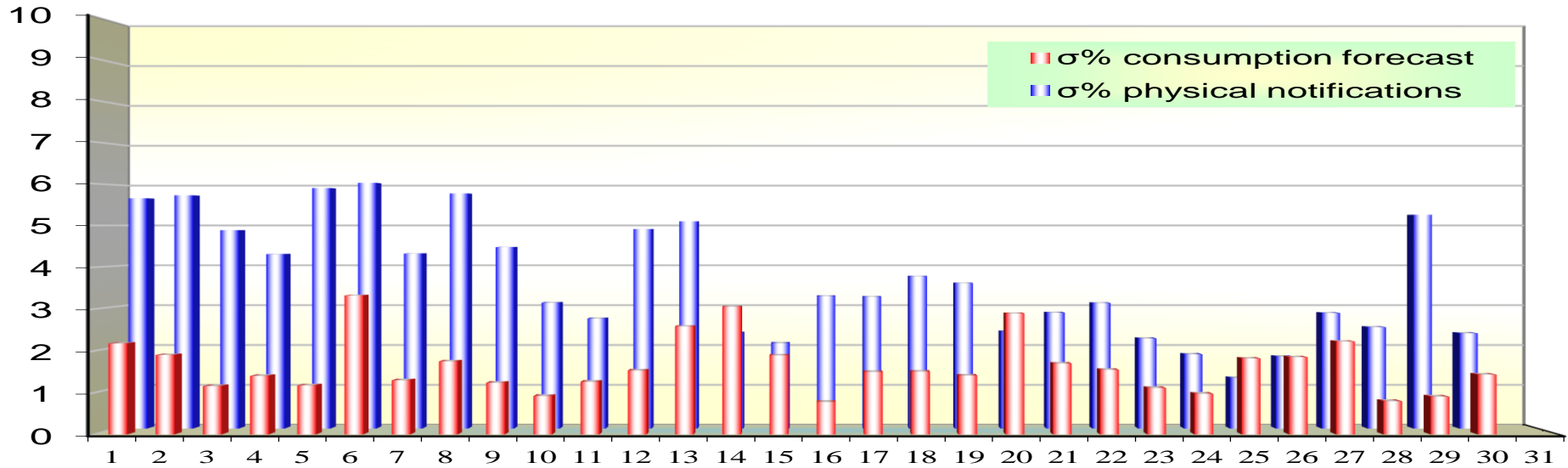


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Balancing Market

Standard deviation of physical notifications and consumption forecast against the actual consumption in November 2022



nov 2022

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
$\sigma\%$ consumption forecast	2.18	1.90	1.16	1.40	1.17	3.33	1.29	1.75	1.23	0.92	1.26	1.53	2.58	3.06	1.89	0.78	1.49	1.50	1.41	2.89	1.70	1.55	1.11	0.97	1.82	1.85	2.22	0.79	0.90	1.43
$\sigma\%$ physical notifications	5.67	5.74	4.88	4.29	5.92	6.05	4.31	5.79	4.47	3.10	2.71	4.91	5.10	2.36	2.10	3.26	3.25	3.75	3.58	2.39	2.85	3.09	2.22	1.83	1.24	1.77	2.84	2.50	5.26	2.35

$\sigma_{\text{average \% consumption forecast}} = 1.64$

$\sigma_{\text{average \% physical notifications}} = 3.65$

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

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

R = Realized Consumption;

N = Physical Notifications;

P = Consumption Forecast.

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Balancing Market

Balancing energy – Selected prices and quantities

• At the beginning of the month on the Balancing Market operated 75 BRPs, 91 market participants, holding 178 commercially operating dispatchable units. Starting with 1st of November 2022 BMP BEPCO SRL (30XROBEPKO-----8) has modified the operational structure of DU, the new contour being formed by the dispatchable production units BEPCO (30W-BEPCO-----3) (composed by aggregating the plants Bepco CET Nord1, CET Nord2, CET Metrom) and NOUA (30W-BEPCONOUA--4). Starting with 9th of November, according to NRA Order no. 213/2020, amended and supplemented by NRA Order no. 33/2021, was registered in the BM, BRP MEGALODON STORAGE (PROBE) (30XRMEGALODON-K), as a result of the start of the trial period of the MEGALODON storage installation.

November 2022

Downward Regulation

Downward Regulation	Prices			Quantities			Participants						
	Weighted				Actually								
	Average	Maximum	Minimum	Selected	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	24483.77	24483.77	0.00%	3	62.83%	100%	62.83%	100%	5301	5301
Fast Tertiary	222.20	300.00	0.50	66329.88	63413.01	4.40%	6	50.41%	94.83%	49.47%	94.82%	3548	3496
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-	-
				90813.65	87896.77	3.21%							

Upward Regulation

	Prices			Quantities			Participants						
	Weighted Average	Maximum	Minimum	Selected	Actually Delivered	Deviation	C1	C3	C1	C3	HHI	HHI (actually delivered)	
	[lei/MWh]	[lei/MWh]	[lei/MWh]	[MWh]	[MWh]	[%]	Number	(selected)	(actually delivered)	(selected)	(selected)	(actually delivered)	
Secondary	2180.87	4000.00	1500.00	18346.53	18346.53	0.00%	3	65.17%	100%	65.17%	100%	5408	5408
Fast Tertiary	1956.23	4000.00	964.71	31817.34	31324.03	1.55%	5	93.59%	99.45%	93.67%	99.50%	8783	8798
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-	-
				50163.87	49670.56	0.98%							



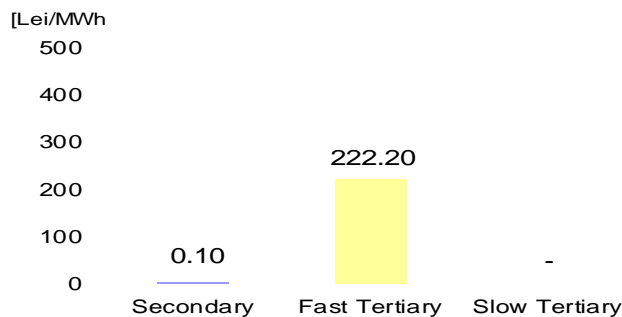
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Balancing Market

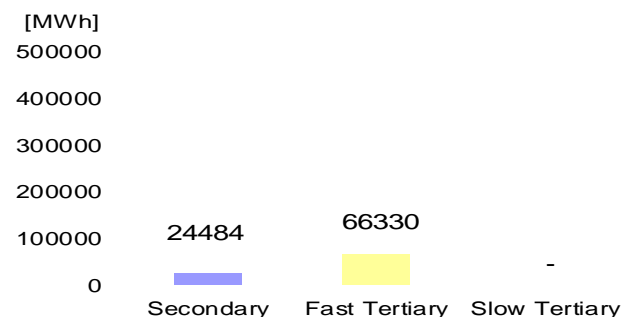
Balancing energy – Selected prices and quantities

November 2022

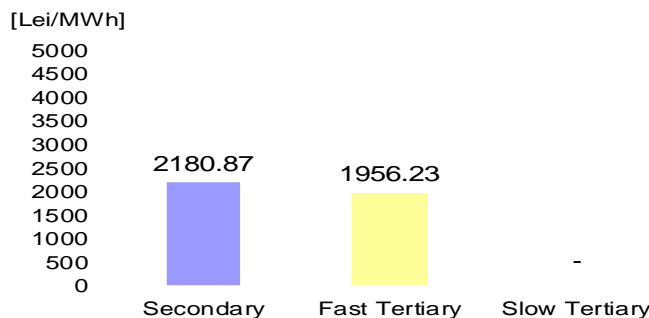
Downward regulation - average price [lei/MWh]



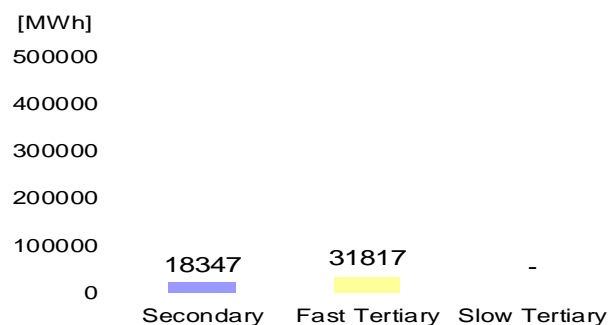
Downward regulation - selected quantities



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 .

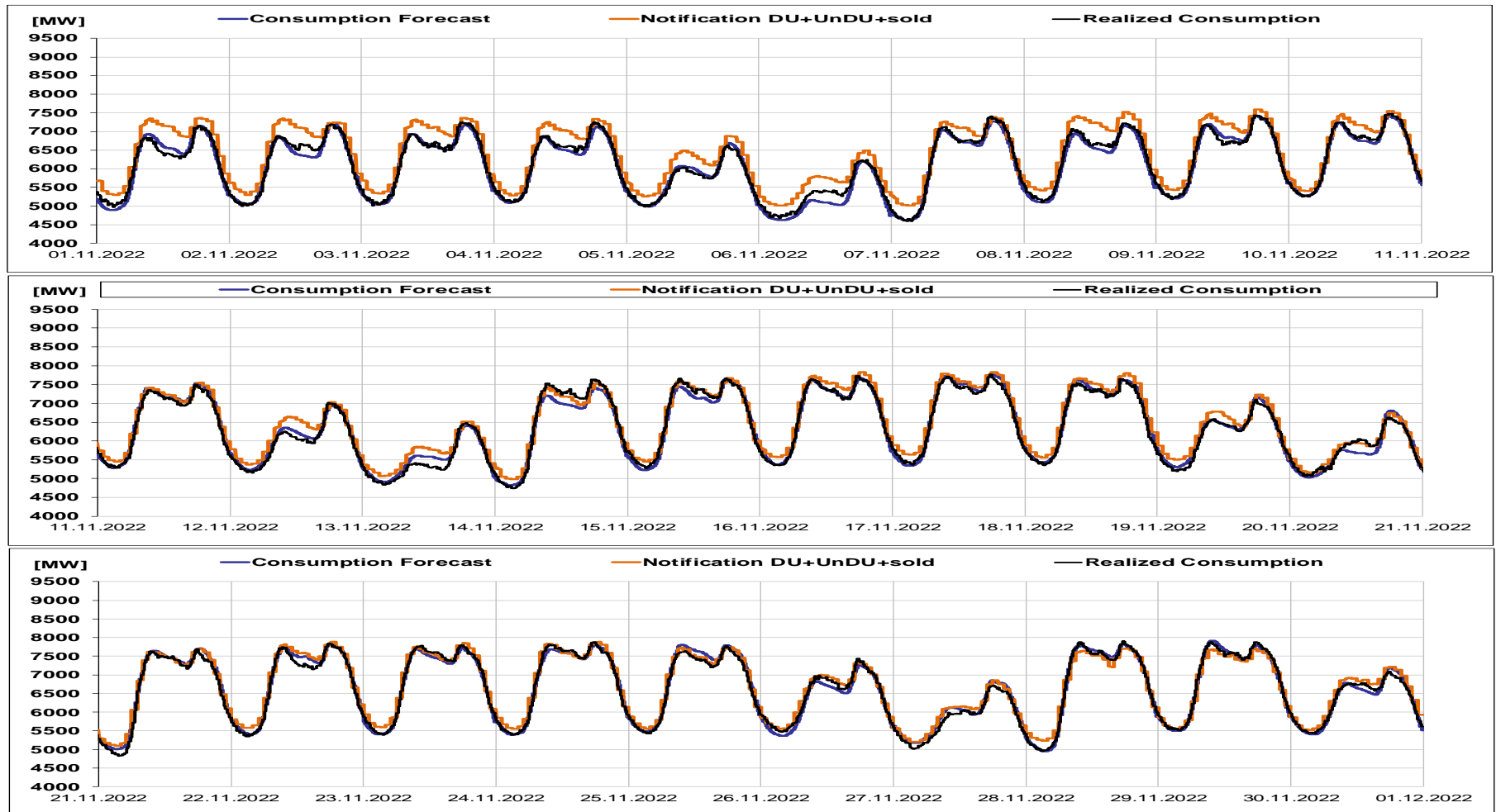


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Balancing Market

Realized consumption, forecast, notifications in D-1



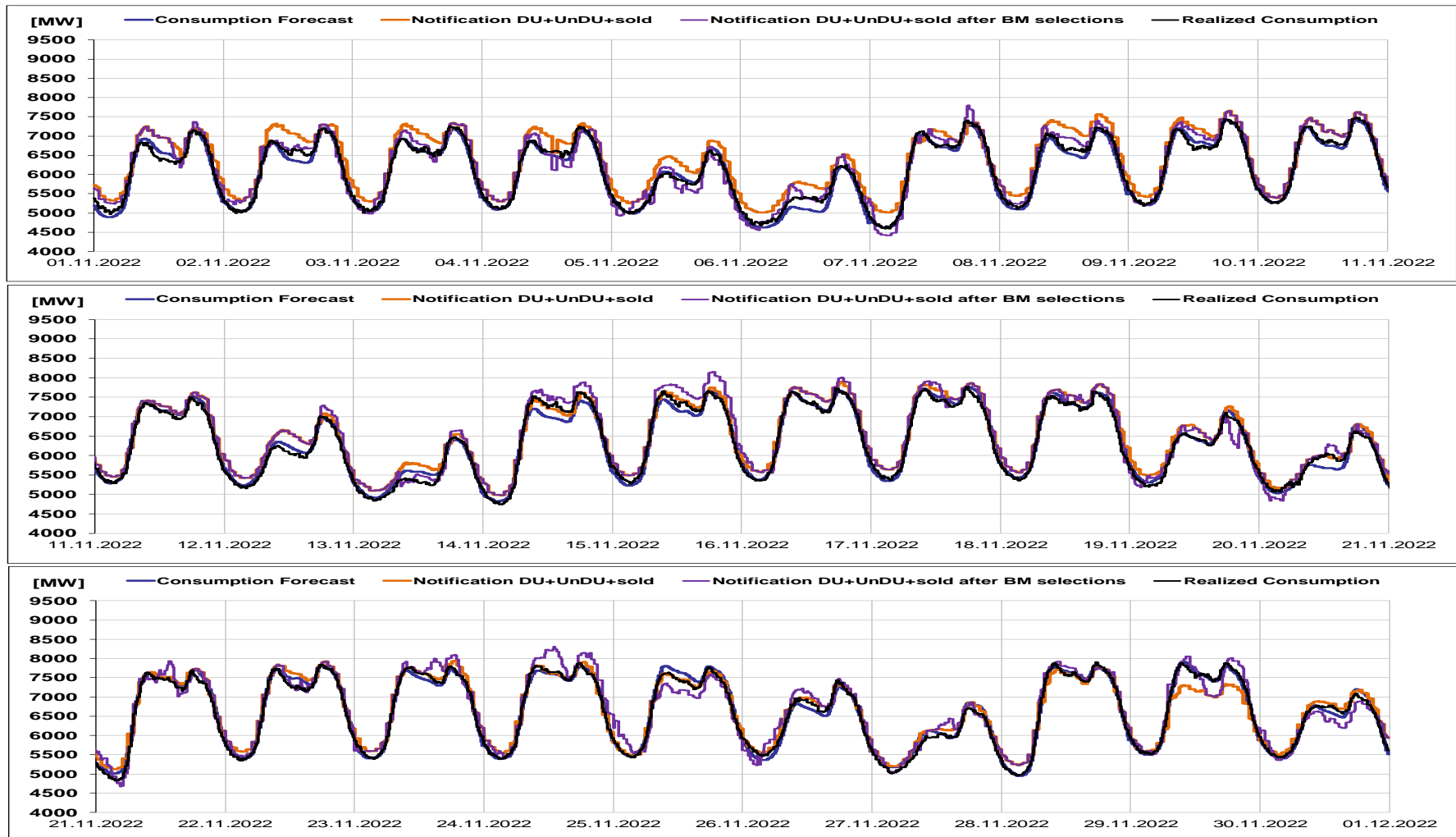


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Balancing Market

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





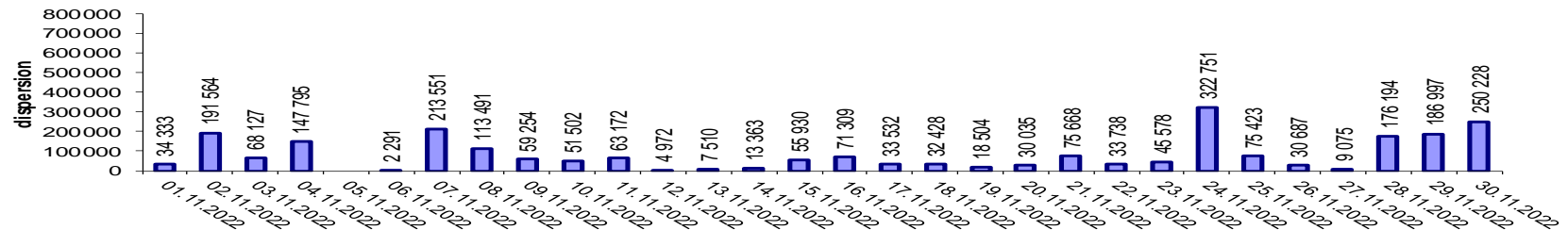
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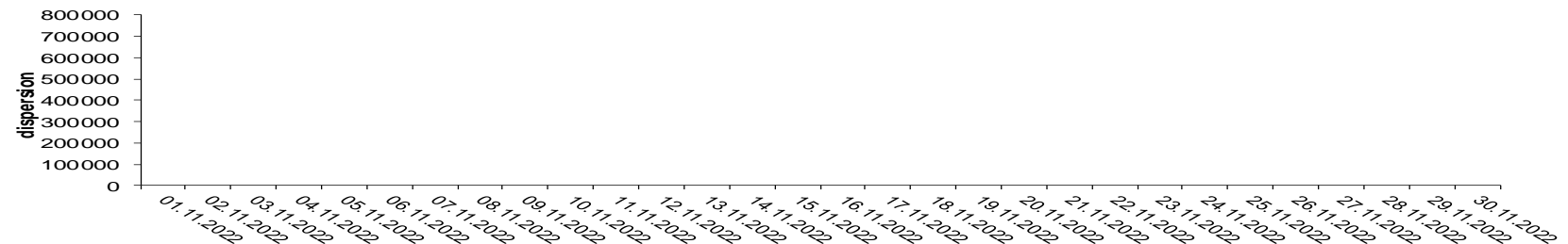
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Indicators – Price Volatility for Secondary Regulation

Price Volatility for Secondary Upward Regulation



Price Volatility for Secondary Downward Regulation



The price volatility for the secondary regulation, determined as the daily dispersion of the price, recorded different values of zero for upward regulation on most days of the month, due to the changes in the price from one dispatching interval to the next and recorded values of zero for downward regulation throughout the month, the cause being the maintenance of the price constant from one dispatching interval to the next.

Volatility = price dispersion on studied interval:

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



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