



Transelectrica®
Societate Administrată în Sistem Dualist

MARKET MONITORING REPORT

Balancing Market

November 2023

ANRE - Romanian Energy Regulatory Authority
HHI - Herfindahl-Hirschman Index
BRP - Balance Responsible Party
BMP - Balancing Market Participant
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

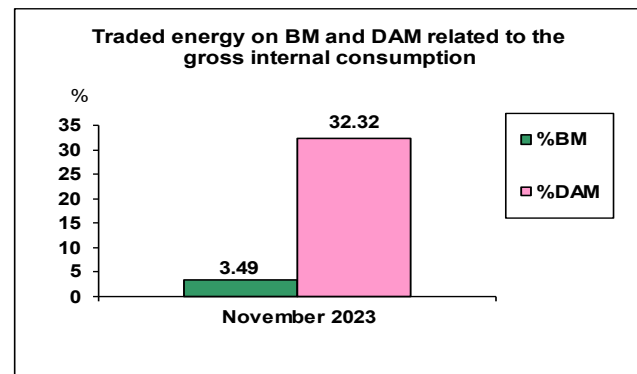
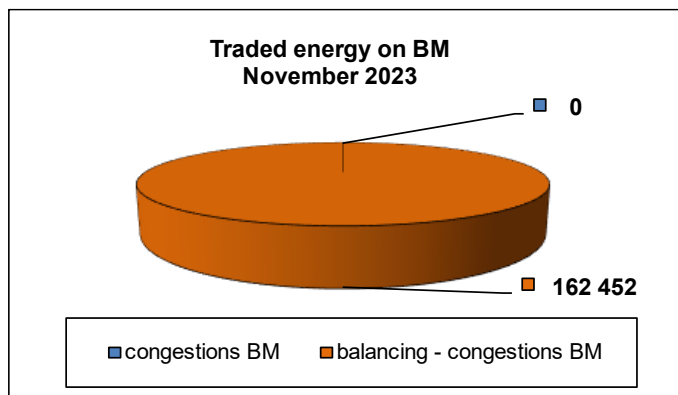
According to the Commercial Code, Transelectrica, the Romanian Transmission System Operator, operates and monitors the activity of 3 types of markets: Balancing Market, Ancillary Services Market and Market for Allocation of Cross-Border Capacities.

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).

- At the beginning of the month on the Balancing Market operated 106 BRPs, 93 market participants, holding 182 commercially operating dispatchable units. According to the provisions of ANRE Order no. 213/2020, as subsequently amended and supplemented during the month, the following changes were made:
 - were registered in the BM during the probationary period, the following BRPs:
 - ✓ BORZESTI POWER (PROBE) (30XROBRZPOWER--2) (01.11), following the start of the trial period for the solar production unit BORZESTI_PROBE;
 - ✓ EVORA CENTER (PROBE) (30XROEVORAPB---K) (08.11), following the start of the trial period for the solar production unit EVORA_PROBE;
 - ✓ PC SUN ENERGY PRODUCTION (PROBE) (30XROPESUNPROD-C) (20.11), following the start of the trial period for the solar production unit OLTENITA2_PROBE;
 - ✓ RATESTI SOLAR PLANT (PROBE) (30XRORATESTISOLM) (24.11), following the start of the trial period for the solar production unit RATESTI_PROBE;
 - ✓ SOLAR ENERGY ULMENI (PROBE) (30XROSOLARULM--U) (28.11), following the start of the trial period for the solar production unit OLTENITA1_PROBE.
 - exited BM, BRP CLUSTER POWER (PROBE) (30XRO-CPOWER---0) (15.11), as a result of the termination of the testing period for the gas production unit CLUSTER_PROBE.
- During the month, the following changes were made in the BM platform:
 - ✓ as of 13th of November 2024 the non-dispatchable gas production unit FAGARAS was registered, with CINTA ENERGY (30XROCINTAEN---N) as BRP;
 - ✓ as of 15th of November 2024 the non-dispatchable gas production unit MISCHII was registered, with ENEL-CIGA (30XROENEL-CIGA-Z) as BRP, after the end of the trial period of the CLUSTER_PROBE production unit;
 - ✓ as of 17th of November 2024 dispatchable solar production unit VALCALUG1 was registered as non-dispatchable, as a result of the withdrawal from the BM of the BMP VIR COMPANY INTERNATIONAL (30XROVIRCOMIN--U).

The Balance Generation/Consumption

- The average monthly value of generated power was 6 493 MW and the actual internal gross consumption was 6 458 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being 2.16%. 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 **3.43%**. The greatest daily deviation regarding the notifications was registered on 5th of November (**7.58%**).
- The energy used in November 2023 for balancing the power system and congestion management was 162 452 MWh (with an average power of 226 MW, which means **3.49%** 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 4 340 MWh (with an average power of 6 MW, which means 0.09% from the internal gross consumption), of which, for congestion management, 247.5 MWh (with an average power of 0.34 MW, which means 0.0053% from the internal gross consumption).
- The energy used in November 2023 on Day Ahead Market was de 1 502 669 MWh (with an average power of 2 087 MW, which means 32.32% from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 171 264 685 lei (with an average weighted price of 1054,25 lei/MWh).
- The value of transactions outside BM (with financial compensation) was 0 lei (with an average weighted price of 0 lei/MWh).
- The cost for the congestion management, paid by CNTEE Transelectrica S.A., was 1,617 lei.



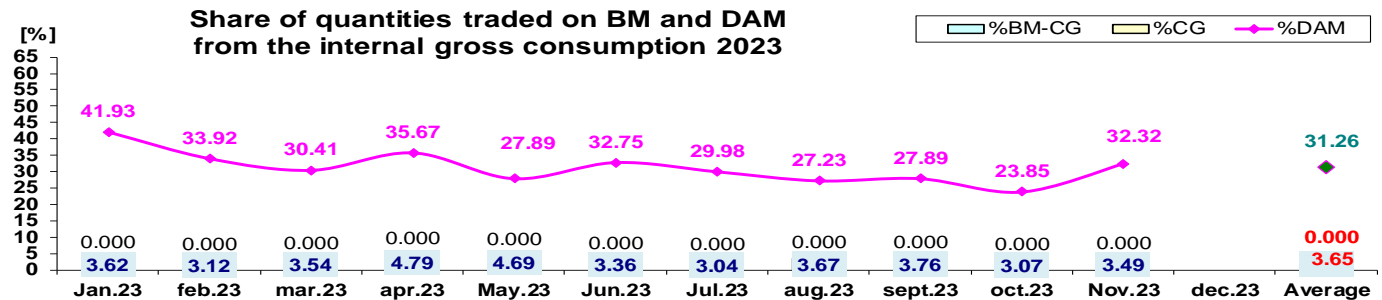
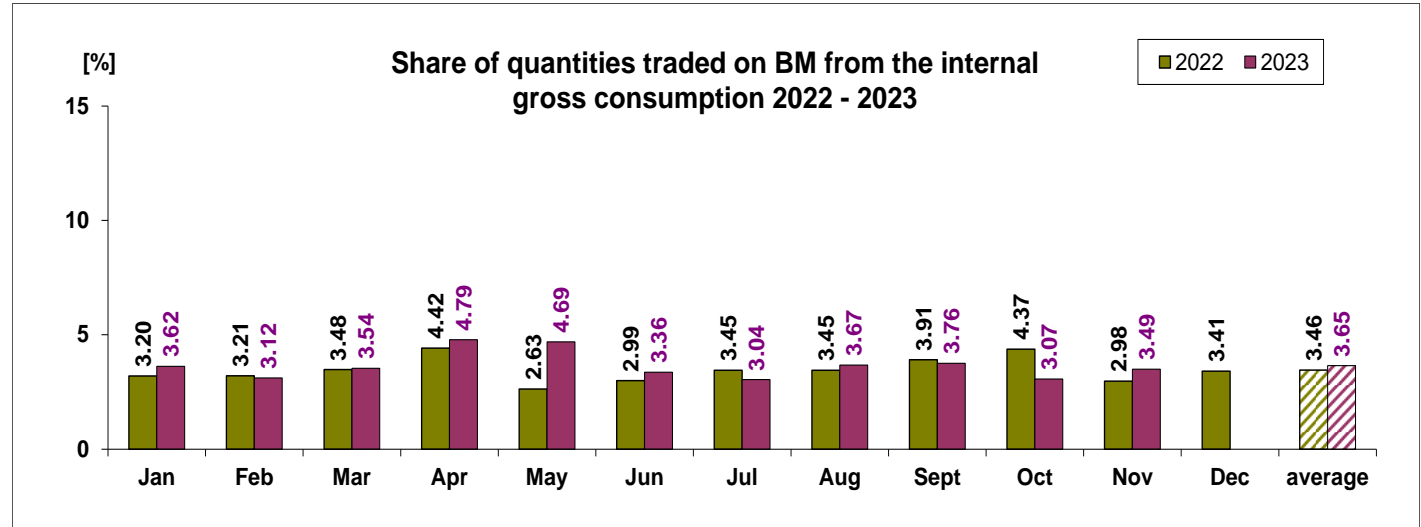


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Balancing Market

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).



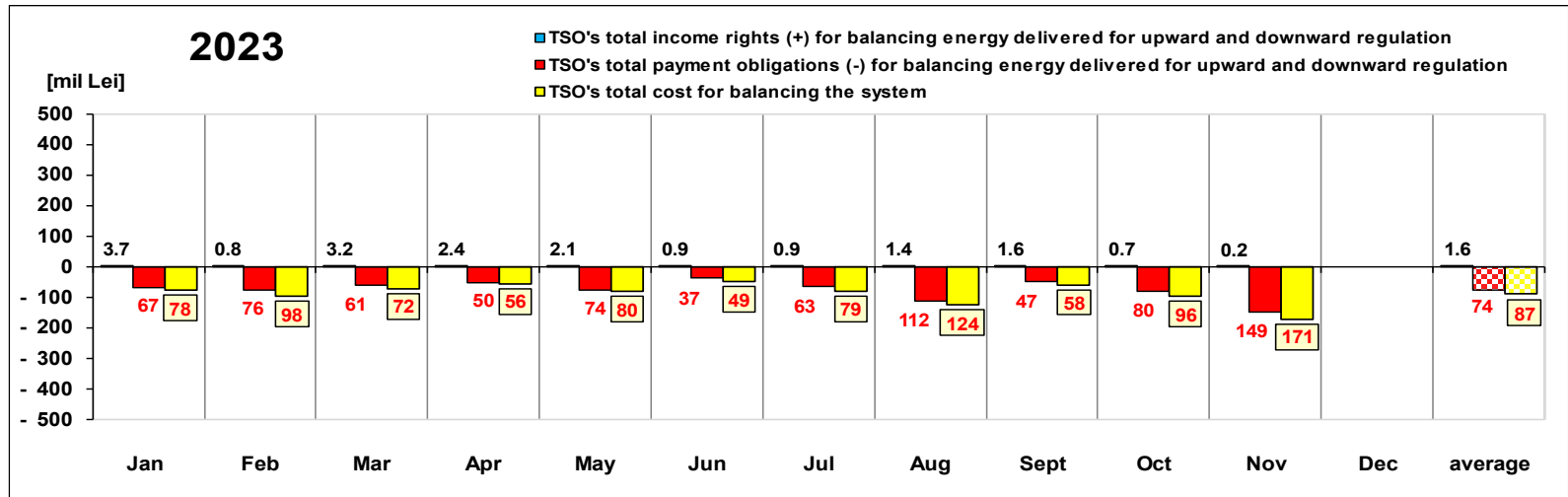
2023													
	Jan.23	feb.23	mar.23	apr.23	May.23	Jun.23	Jul.23	aug.23	sept.23	oct.23	Nov.23	dec.23	Average
%BM	3.62	3.12	3.54	4.79	4.69	3.36	3.04	3.67	3.76	3.07	3.49		3.65
%DAM	41.93	33.92	30.41	35.67	27.89	32.75	29.98	27.23	27.89	23.85	32.32		31.26
%CG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000
%BM-CG	3.620	3.117	3.538	4.785	4.694	3.361	3.042	3.674	3.757	3.070	3.494		3.650
% outside BM	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.09		0.02



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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	3 671 254	764 288	3 191 826	2 401 619	2 148 297	863 275	876 789	1 355 937	1 572 926	652 619	159 926		1 605 341	17 658 756
	payments (-) prices < 0	-18 058 105	-13 750 607	-2 780 494	-2 350 152	-47 431 536	-1 766 011	-8 527 301	-19 279 175	-11 283 967	-11 655 754	-13 505 403		-13 671 682	- 150 388 504
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	-34 764 702	-54 359 588	-93 001 775	-35 707 283	-68 709 476	-135 304 735		-60 516 959	- 665 686 549
	incomes (+) prices < 0	0	0	0	0	0	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	863 275	876 789	1 355 937	1 572 926	652 619	159 926		1 605 341	17 658 756
TSO's total payment obligations (-) for		-67 017 580	-75 907 841	-60 664 291	-50 167 631	-74 452 541	-36 530 713	-62 886 889	-112 280 949	-46 991 250	-80 365 230	-148 810 138		-74 188 641	- 816 075 053
TSO's total cost for balancing the system		-78 018 832	-97 917 681	-71 922 686	-55 930 994	-80 062 808	-49 361 669	-79 044 687	-124 460 308	-58 166 023	-96 097 589	-171 264 685		-87 477 088	- 962 247 963
Value of transactions outside BM (with		0	0	0	- 66 398	- 14 919	0	0	0	0	0	0		- 7 392	- 81 317
Congestion Cost on BM		0	0	0	0	0	0	0	0	0	0	0		0	0
Congestion Cost outside BM		0	0	0	- 88 286	0	0	0	0	0	0	- 1 617		- 8 173	- 89 903

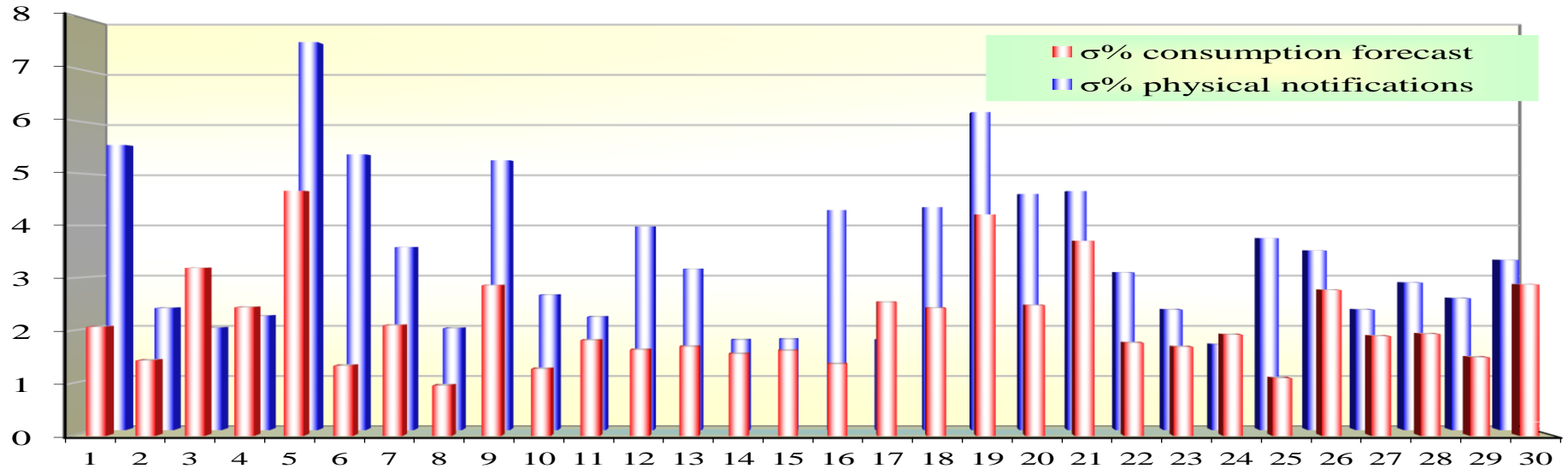
* The annual average value was obtained as arithmetic average of the monthly values.



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Balancing Market

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



nov 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
σ% consumption forecast	2.07	1.43	3.19	2.44	4.66	1.33	2.10	0.96	2.86	1.27	1.82	1.64	1.70	1.56	1.62	1.37	2.54	2.43	4.21	2.48	3.71	1.77	1.69	1.92	1.10	2.77	1.90	1.94	1.49	2.88
σ% physical notifications	5.57	2.38	2.00	2.23	7.58	5.39	3.58	1.99	5.27	2.64	2.21	3.98	3.15	1.76	1.77	4.30	1.75	4.36	6.22	4.62	4.67	3.08	2.35	1.67	3.75	3.51	2.35	2.88	2.58	3.33

σ_{average}% consumption forecast = 2.16

σ_{average} % physical notifications = 3.43

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

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

R = Realized Consumption;

N = Physical Notifications;

P = Consumption Forecast.

Public



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Balancing Market

Balancing energy – Selected prices and quantities in November 2023

November 2023

Downward Regulation

Downward Regulation	Prices			Quantities			Participants						
	Weighted	Maximum	Minimum	Selected	Actually	Deviation	C1	C3	C1	C3	HHI	HHI	
	Average				Delivered								
	[lei/MWh]	[lei/MWh]	[lei/MWh]	[MWh]	[MWh]	[%]	Number	(selected)	(actually delivered)	(selected)	(actually delivered)		
	Secondary	-604.96	0.10	-1200.00	21885.24	21885.24	0.00%	4	65.38%	98.64%	65.38%	98.64%	4885
Fast Tertiary	-3.91	100.00	-200.00	27130.39	25856.42	4.70%	12	64.83%	95.18%	64.60%	95.49%	5017	5026
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-	-
				49015.63	47741.66	2.60%							

Upward Regulation

	Prices			Quantities			Participants						
	Weighted	Maximum	Minimum	Selected	Actually	Deviation	C1	C3	C1	C3	HHI	HHI	
	Average				Delivered								
	[lei/MWh]	[lei/MWh]	[lei/MWh]	[MWh]	[MWh]	[%]	Number	(selected)	(actually delivered)	(selected)	(actually delivered)		
Secondary	2380.42	2900.00	2000.00	17986.57	17986.57	0.00%	4	67.28%	98.55%	67.28%	98.55%	5125	5125
Fast Tertiary	957.08	1733.81	400.00	98937.76	96723.47	2.24%	9	86.94%	96.02%	87%	96%	7605	7615
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-	-
				116924.33	114710.04	1.89%							

nov.23

Downward Regulation

	Quantities outside BM (with financial compensation)			Participants
	Selected	Actually Delivered	Undelivered	Number
	[MWh]	[MWh]	[%]	
Fast Tertiary	4340.00	4340.00	0.00	1



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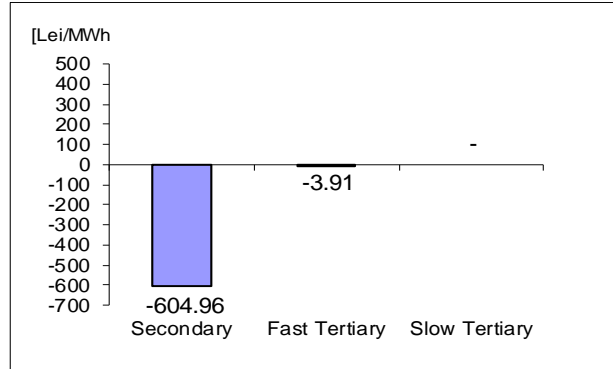
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November 2023

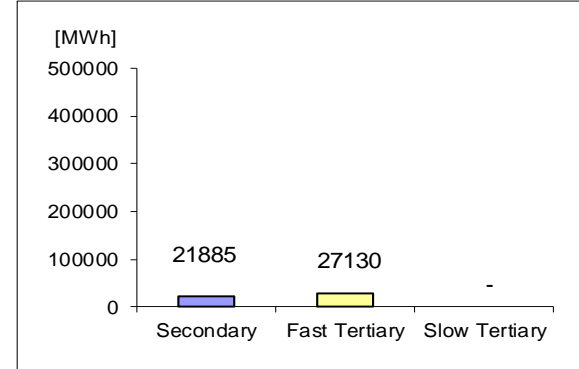
Balancing Market

Balancing energy – Selected prices and quantities in November 2023

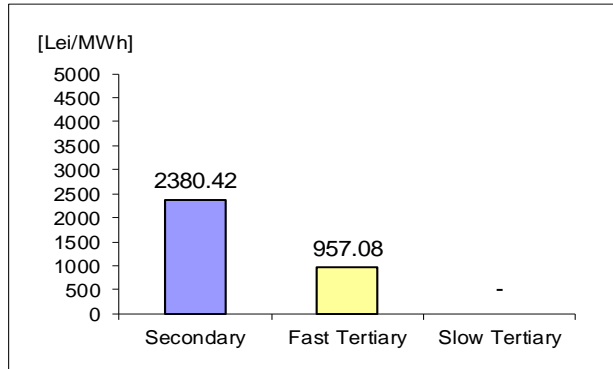
Downward regulation - average price [lei/MWh]



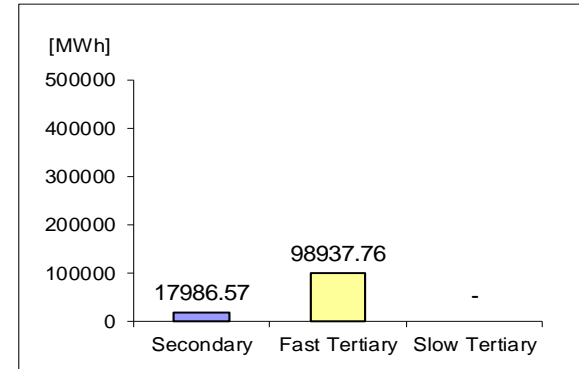
Downward regulation - selected quantities



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 .

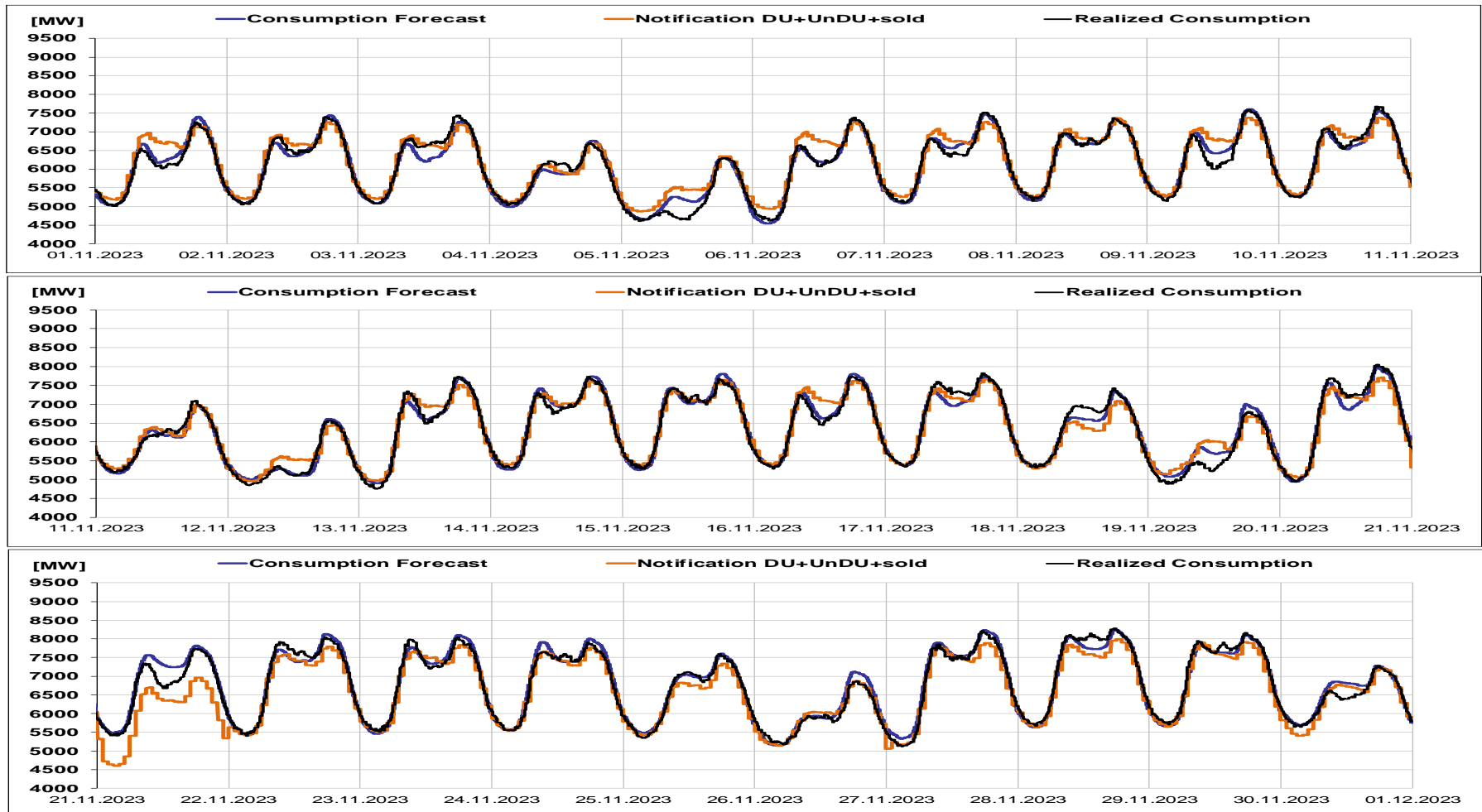


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Realized consumption, forecast, notifications in D-1



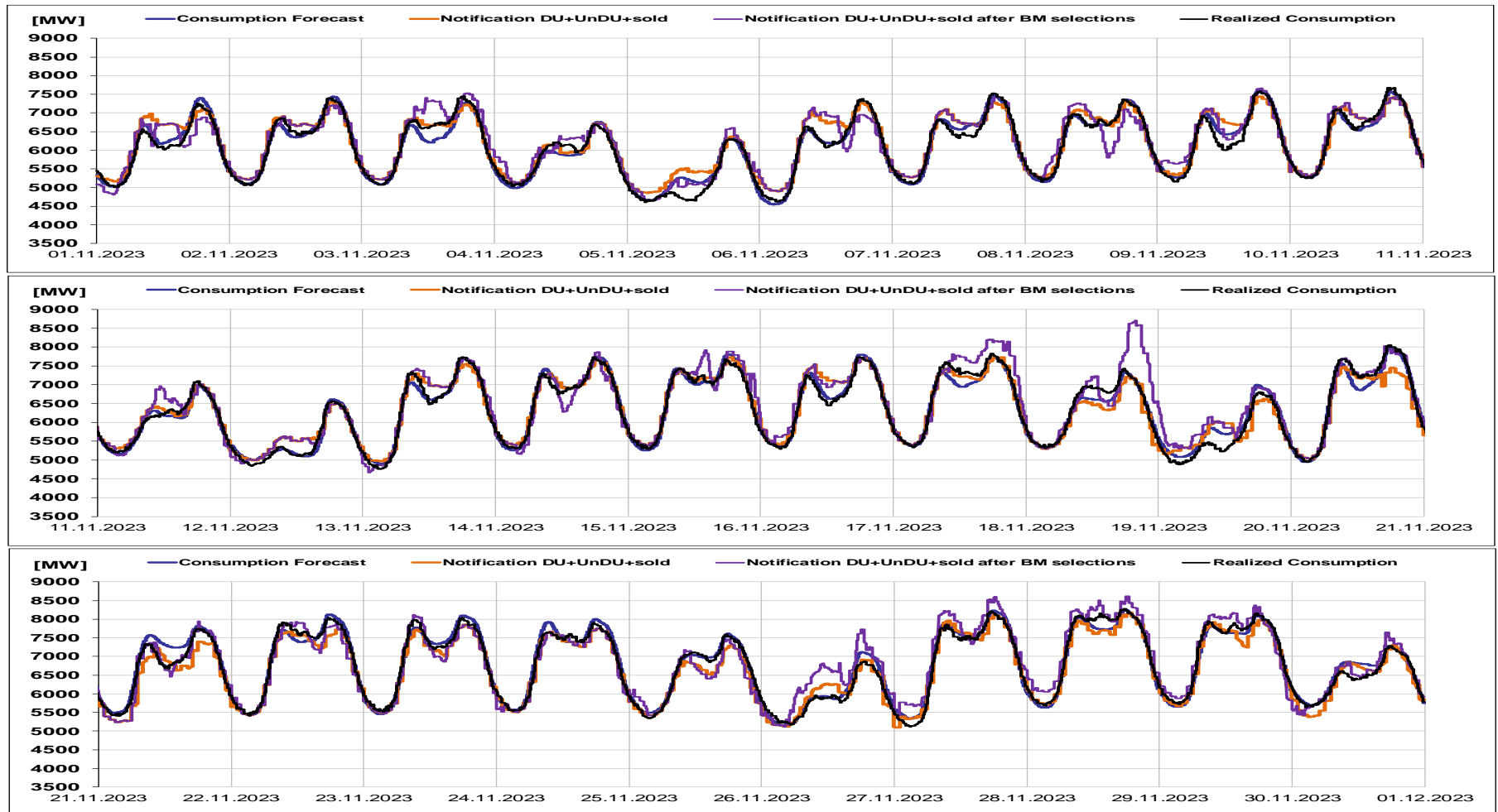


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Balancing Market

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



Balancing Market

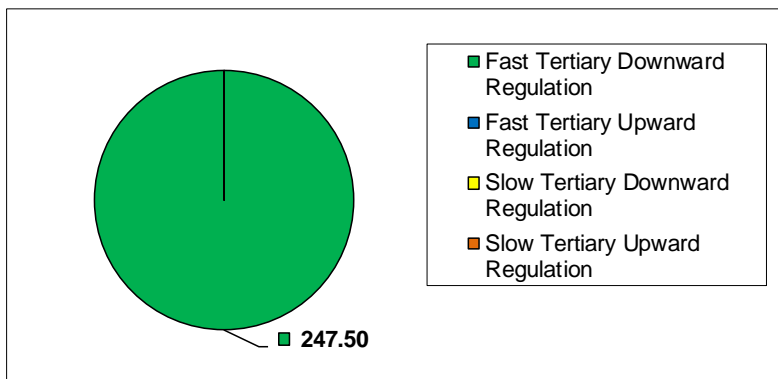
Congestion Management

Transactions outside
BM
(financial
compensation)

November 2023

	Selected [MWh]	Actually Delivered	Number
Fast Tertiary Downward Regulation	247.50	247.50	1
Fast Tertiary Upward Regulation	0.00	-	0
Slow Tertiary Downward Regulation	0.00	-	0
Slow Tertiary Upward Regulation	0.00	-	0
	247.50	247.50	

Selected energy [MWh]



Note: the value of the energy selected/delivered related to the final transactions for the congestion management (which induces costs for congestion management) is the one resulting after applying the costing algorithm for balancing the system and for congestion management in the settlement stage on the balancing market.



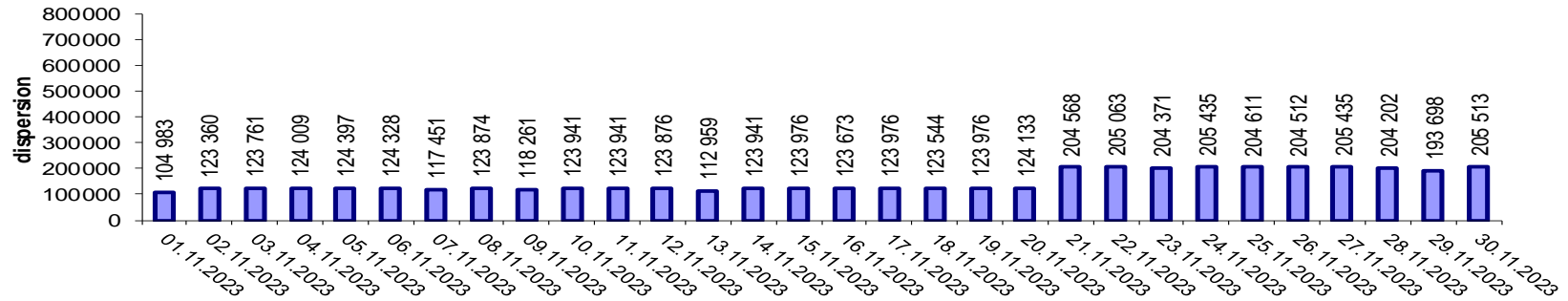
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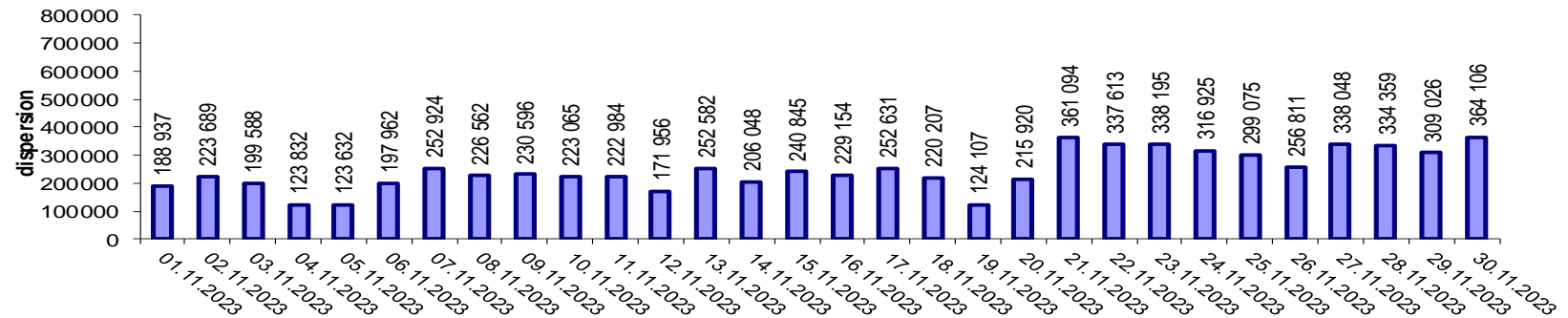
Balancing Market

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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