



Transelectrica®
Societate Administrată în Sistem Dualist

MARKET MONITORING REPORT

Balancing Market

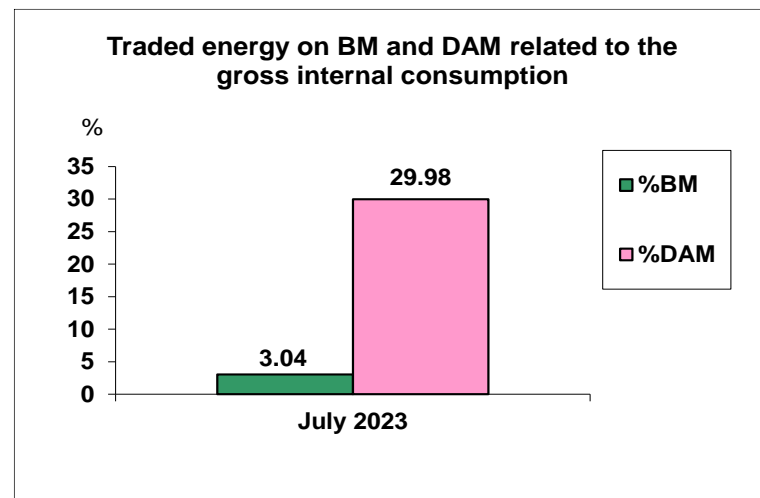
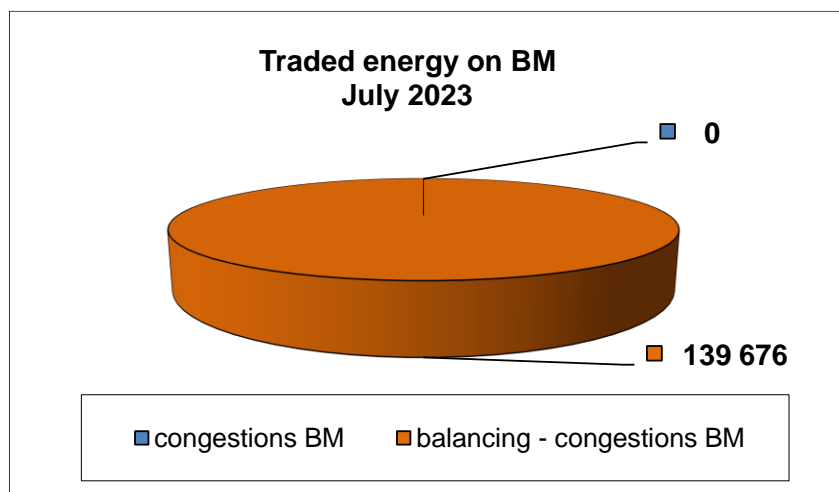
July 2023

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).

- The average monthly value of generated power was 6 231 MW and the actual internal gross consumption was 6 171 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being **2.85%**. 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 **6.3%**. The greatest daily deviation regarding the notifications was registered on 28th of July (**12.28%**).
- The energy used in July 2023 for balancing the power system and congestion management was 139 676 MWh (with an average power of 188 MW, which means **3.04%** from the internal gross consumption).
- There was no energy used for congestion management, nor for transactions outside BM (with financial compensation).
- The energy used in July 2023 on Day Ahead Market was de 1 376 399 MWh (with an average power of 1 850 MW, which means 29.98% from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 79 017 093 lei (with an average weighted price of 565.72 lei/MWh).



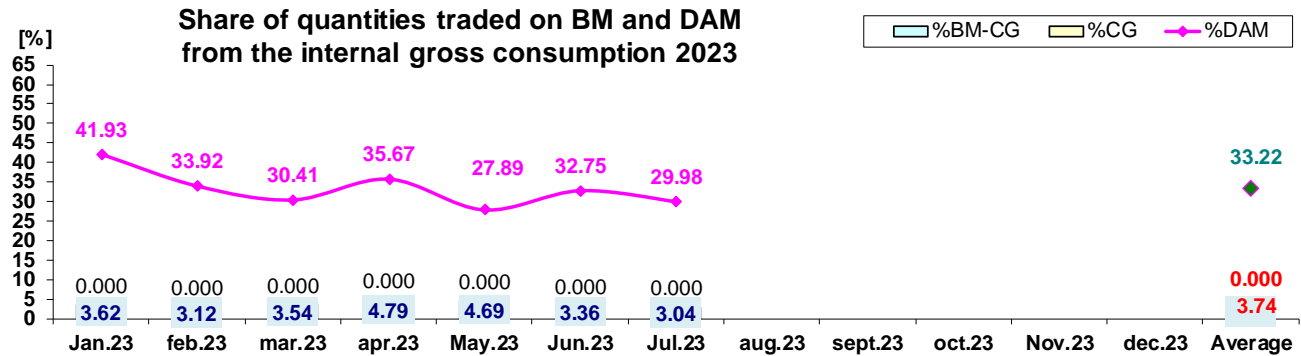
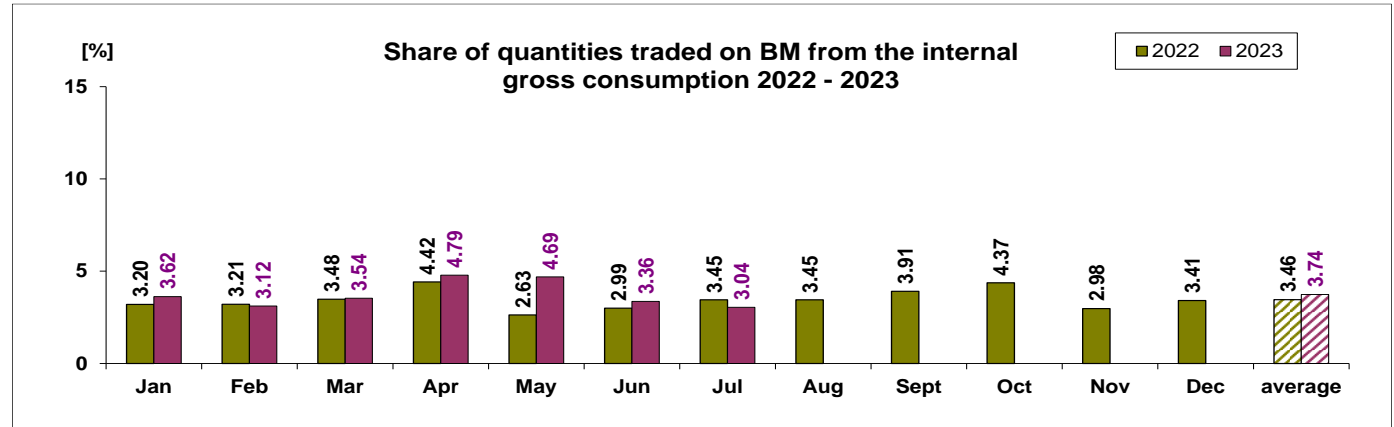


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Balancing Market

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).



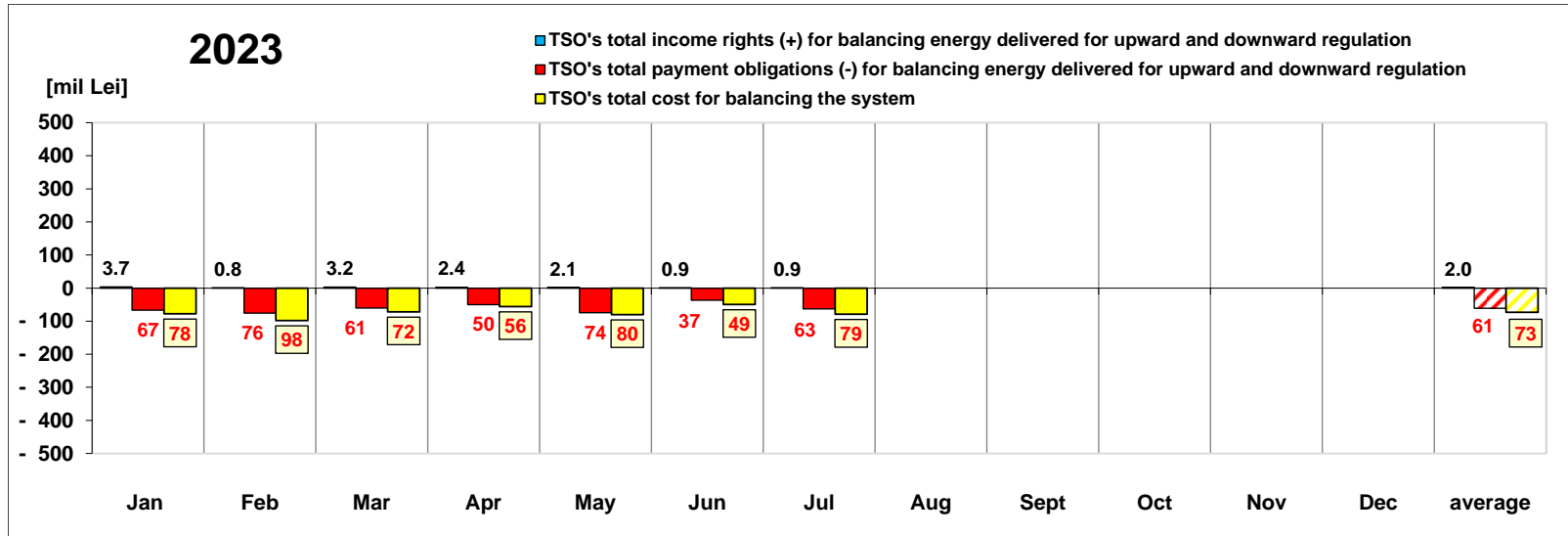
	2023												
	Jan.23	feb.23	mar.23	apr.23	May.23	Jun.23	Jul.23	aug.23	sept.23	oct.23	Nov.23	dec.23	Average
%BM	3.62	3.12	3.54	4.79	4.69	3.36	3.04						3.74
%DAM	41.93	33.92	30.41	35.67	27.89	32.75	29.98						33.22
%CG	0.000	0.000	0.000	0.000	0.000	0.000	0.000						0.000
%BM-CG	3.620	3.117	3.538	4.785	4.694	3.361	3.042						3.737
% outside BM	0.00	0.00	0.00	0.00	0.08	0.00	0.00						0.01



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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						1 988 193	13 917 348
	payments (-) prices < 0	-18 058 105	-13 750 607	-2 780 494	-2 350 152	-47 431 536	-1 766 011	-8 527 301						-13 523 458	- 94 664 205
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						-47 566 183	- 332 963 281
	incomes (+) prices < 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						1 988 193	13 917 348
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						-61 089 641	- 427 627 486
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						-73 179 908	- 512 259 358
Value of transactions outside BM (with		0	0	0	- 66 398	- 14 919	0	0						- 11 617	- 81 317
Congestion Cost on BM		0	0	0	0	0	0	0						0	0
Congestion Cost outside BM		0	0	0	- 88 286	0	0	0						- 12 612	- 88 286

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

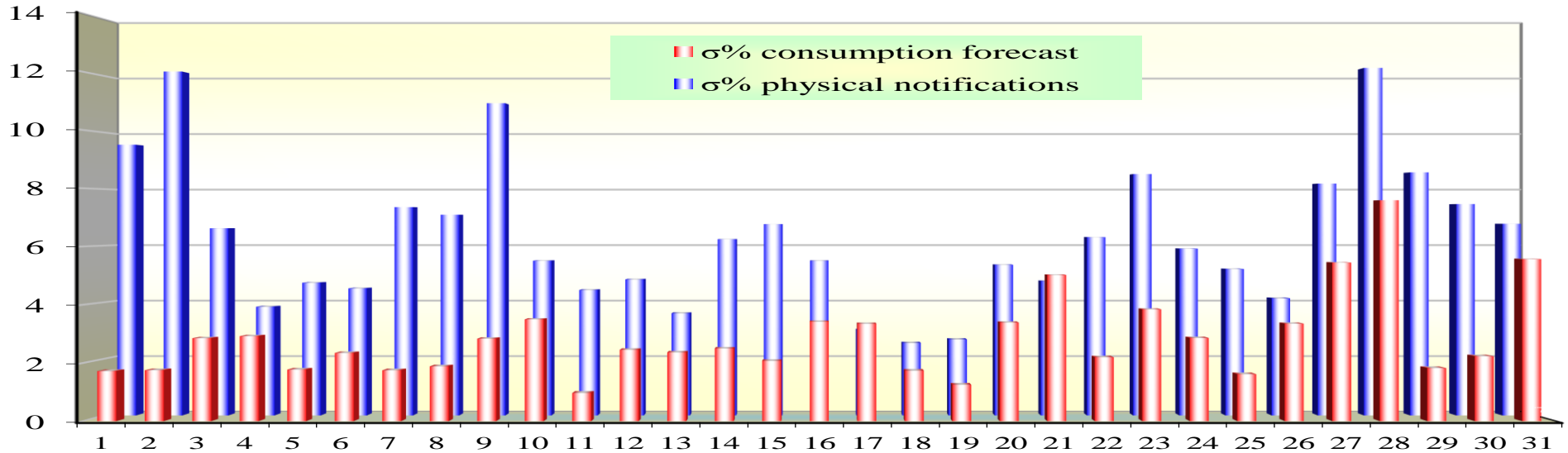
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Balancing Market

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



Jul 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	1.72	1.75	2.85	2.92	1.77	2.34	1.75	1.88	2.83	3.50	0.97	2.45	2.36	2.50	2.07	3.42	3.35	1.73	1.25	3.39	5.02	2.19	3.84	2.86	1.61	3.35	5.45	7.59	1.82	2.23	5.57
σ% physical notifications	9.57	12.15	6.61	3.84	4.69	4.49	7.36	7.09	11.03	5.47	4.43	4.81	3.61	6.22	6.76	5.46	3.02	2.56	2.68	5.32	4.75	6.30	8.53	5.89	5.17	4.14	8.19	12.28	8.59	7.47	6.77

σ_{average}% consumption forecast = 2.85

σ_{average} % physical notifications = 6.30

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

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

R = Realized Consumption;

N = Physical Notifications;

P = Consumption Forecast.

Public

- At the beginning of the month on the Balancing Market operated 88 BRPs, 91 market participants, holding 179 commercially operating dispatchable units. According to the provisions of ANRE Order no. 213/2020, as subsequently amended and supplemented, the following modifications were made during the month:
 - were registered in the BM during the probationary period, the following BRPs:
 - ✓ ENERGY INNOVATIVE SOLUTIONS (PROBE) (30XRO-EIS-----S) (05.07) following the start of the trial period for the gas production unit RACARI_PROBE;
 - ✓ CTPARK ETA (PROBE) (30XRO-CTPARKETA6) (06.07),) following the start of the trial period for the solar production unit ETA1+2_PROBE;
 - ✓ CTPARK BUCHAREST WEST I (PROBE) (30XROCTPARKWESTA) (06.07), following the start of the trial period for the solar production unit WEST_PROBE;
 - ✓ NOVA POWER SOLAR 50 (PROBE) (30XRO-NPS50----C) (10.07), following the start of the trial period for the solar production unit SOTANGA1;
 - ✓ NOVA SOLAR PRODUCTION 30 (PROBE) (30XRO-NSP30----N) (10.07), following the start of the trial period for the solar production unit solară SOTANGA2;
 - ✓ FUTURE PV (PROBE) (30XROFUTUREPV--W) (15.07), following the start of the trial period for the solar production unit solară FUTURE1+2_PROBE;
 - ✓ DFG ACTIVE IMOBILIARE (PROBE) (30XRODFGACTIVE-5) (26.07), following the start of the trial period for the solar production unit solară PRUNDENI_PROBE.
 - As of 10th of July 2023, BRP SUN CHALLENGE (PROBE) (30XROSUNCHALLP-F) was removed from BM as a result of the termination of the trial period at the CALUGARENI solar production unit.

Balancing Market

Balancing energy – Selected prices and quantities

July 2023

Downward Regulation

Downward Regulation	Prices			Quantities			Participants						
	Weighted				Actually								
	Average	Maximum	Minimum	Selected	Delivered	Deviation		C1	C3	C1	C3	HHI	HHI
													(actually
	[lei/MWh]	[lei/MWh]	[lei/MWh]	[MWh]	[MWh]	[%]	Number	(selected)		(actually delivered)	(selected)		delivered)
Secondary	-220.39	0.10	-1000.00	32483.02	32483.02	0.00%	4	71.50%	99%	71.50%	99%	5573	5573
Fast Tertiary	-7.32	255.00	-300.00	70233.25	67014.26	4.58%	14	56.32%	96.04%	55.70%	96.33%	4647	4661
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-	-
				102716.27	99497.28	3.13%							

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)	(actually delivered)		
Secondary	2037.26	3000.00	2000.00	12972.44	12972.44	0.00%	4	71.60%	98.92%	71.60%	98.92%	5563	5563
Fast Tertiary	1026.46	1557.48	552.12	27914.55	27205.82	2.54%	8	74.33%	93.23%	74.48%	93.39%	5767	5791
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-	-
				40886.99	40178.26	1.73%							



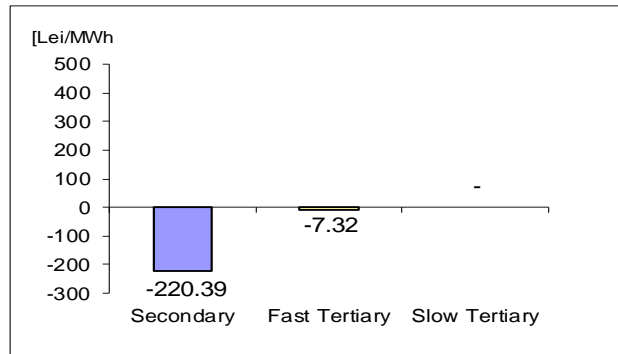
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Balancing Market

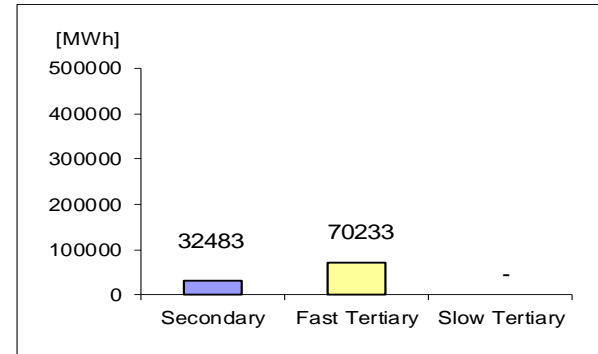
Balancing energy – Selected prices and quantities in July 2023

July 2023

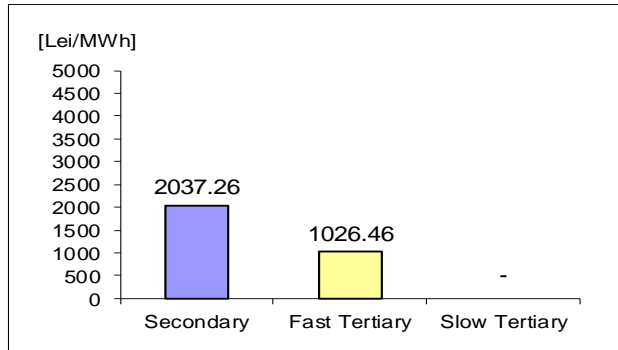
Downward regulation - average price [lei/MWh]



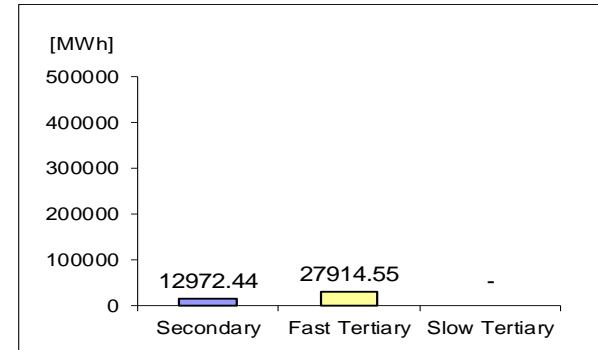
Downward regulation - selected quantities



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 .

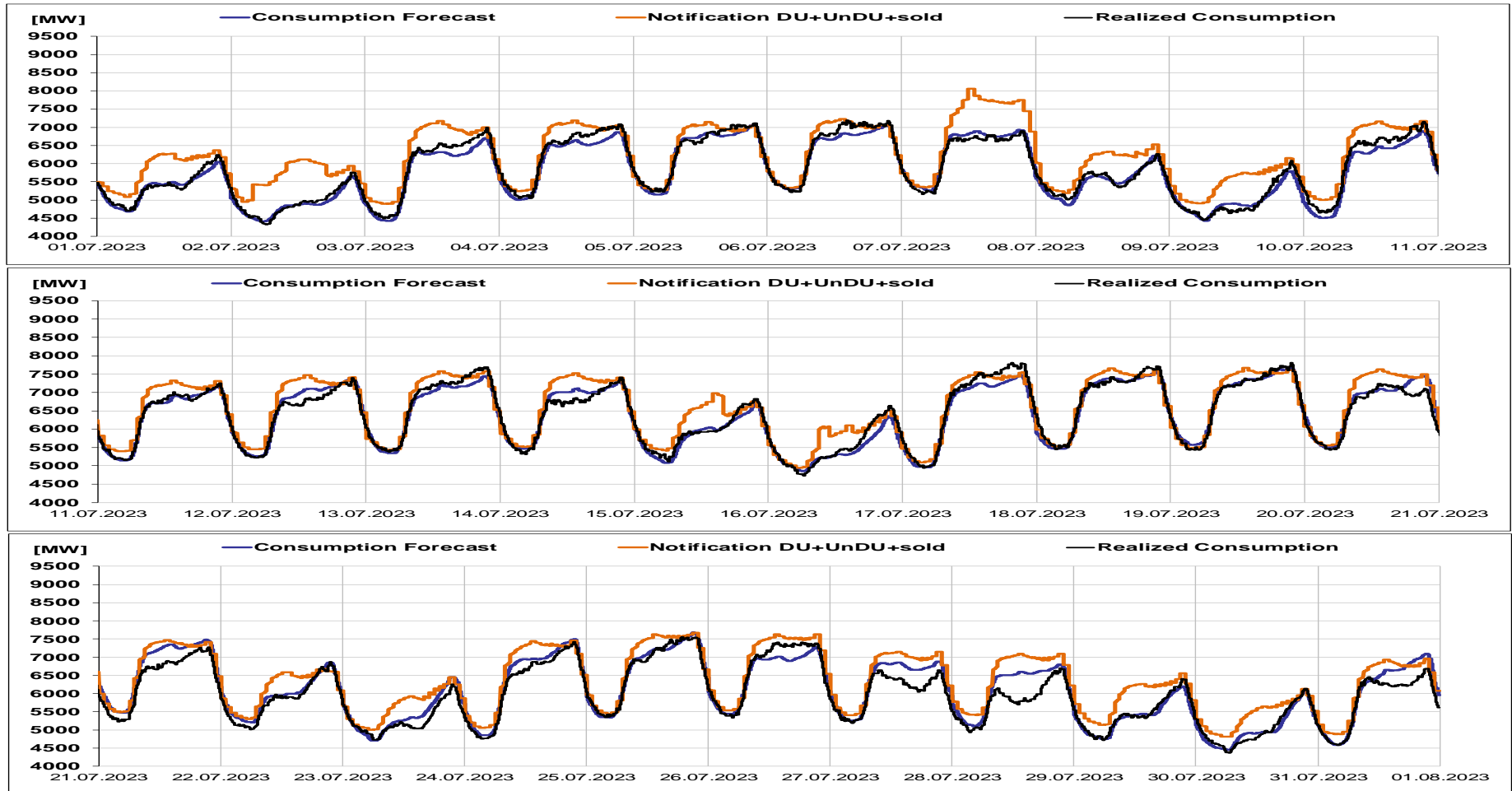


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Realized consumption, forecast, notifications in D-1



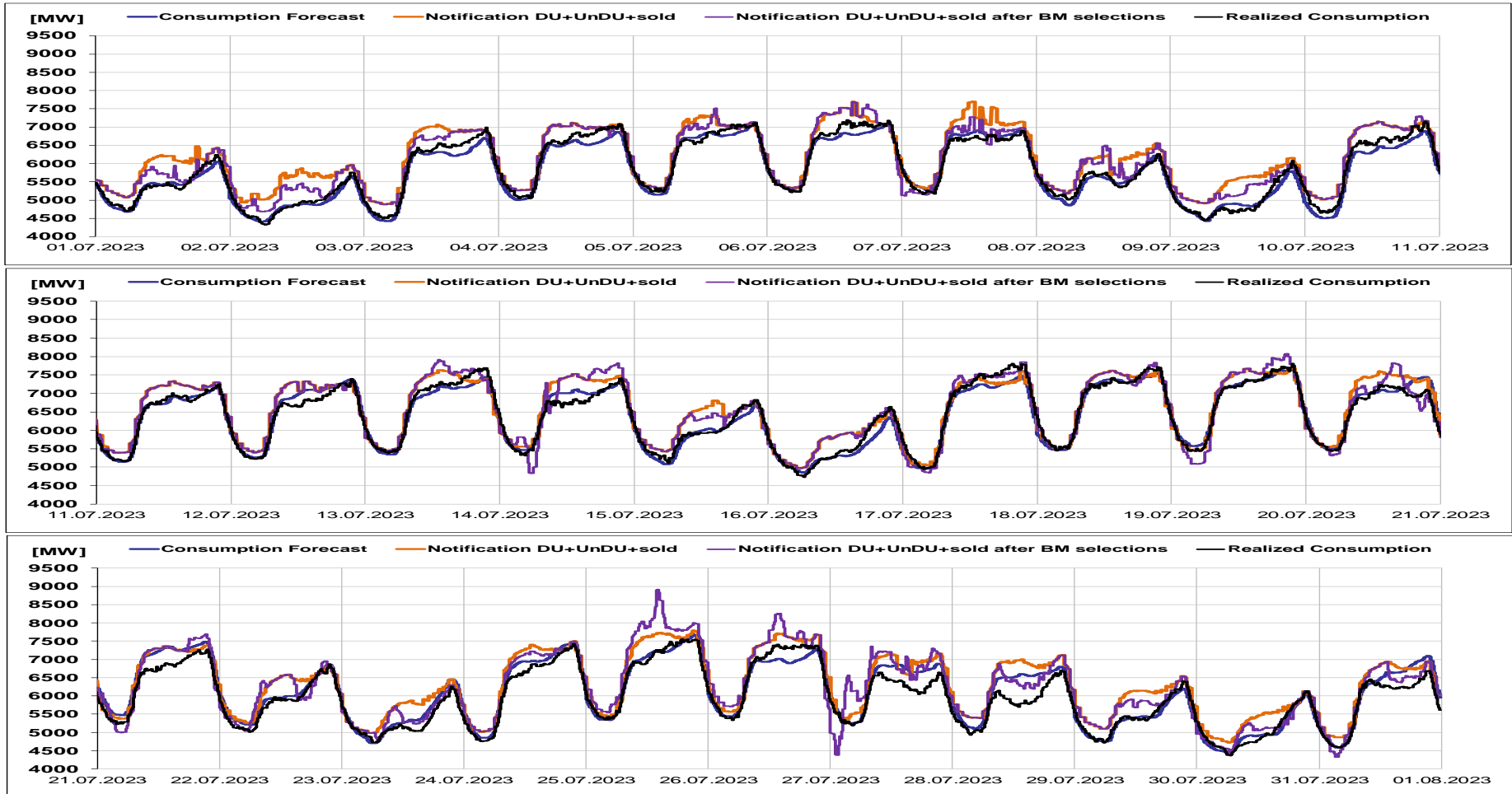


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Balancing Market

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



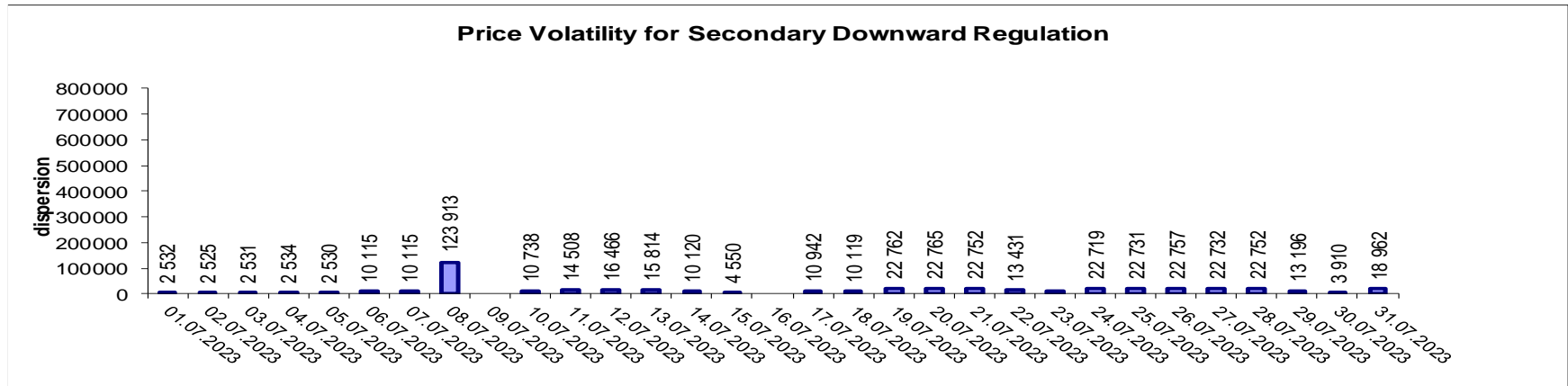
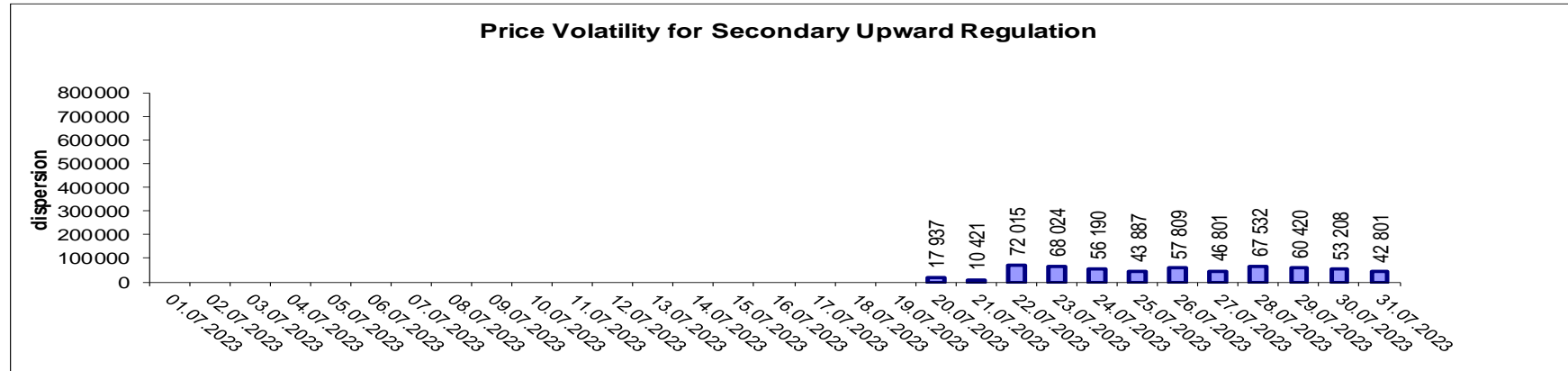


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Balancing Market

Indicators – Price Volatility for Secondary Regulation



Volatility = price dispersion on studied interval:

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



Email: Monitorizare.Piata@transelectrica.ro

Fax: 021 3035630