



**Transelectrica®**  
Societate Administrată în Sistem Dualist

# **MARKET MONITORING REPORT**

## **Balancing Market**

### **April 2023**

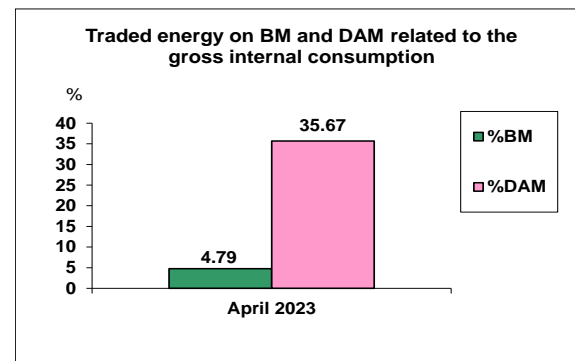
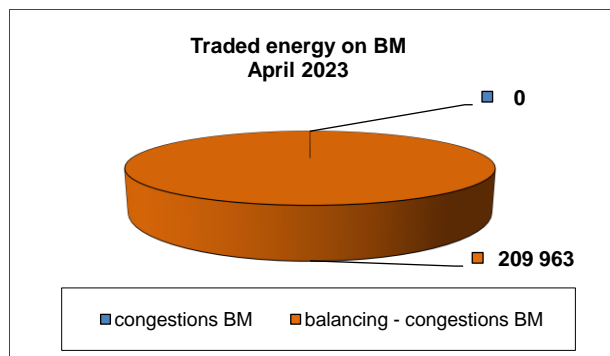
ANRE - Romanian Energy Regulatory Authority  
HHI - Herfindahl-Hirschman Index  
BRP - Balance Responsible Party  
BM - Balancing Market  
DAM - Day Ahead Market  
TSO - Transmission System Operator  
DU – Dispatchable Unit  
PN – Physical Notification  
NDC - National Dispatching Center  
C1 – The market 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](http://www.transelectrica.ro) (section Transparency).

## The Balance Generation/Consumption

- The average monthly value of generated power was 7 194 MW and the actual internal gross consumption was 6 094 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being **2.35%**. 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 **7.09%**. The greatest daily deviation regarding the notifications was registered on 30<sup>th</sup> of April (**17.14%**).
- The energy used in April 2023 for balancing the power system and congestion management was 209 963 MWh (with an average power of 292 MW, which means **4.79%** 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 171.53 MWh (with an average power of 0.29 MW, which means 0.004% from the internal gross consumption), of which, for congestion management, 171.53 MWh (with an average power of 0.24 MW, which means 0.004% from the internal gross consumption).
- The energy used in April 2023 on Day Ahead Market was de 1 565 233 MWh (with an average power of 2 174 MW, which means 35.67% from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 55 940 051 lei (with an average weighted price of 266.43 lei/MWh).
- The value of transactions outside BM (with financial compensation) was -66 398 lei (with an average weighted price of -387.09 lei/MWh)





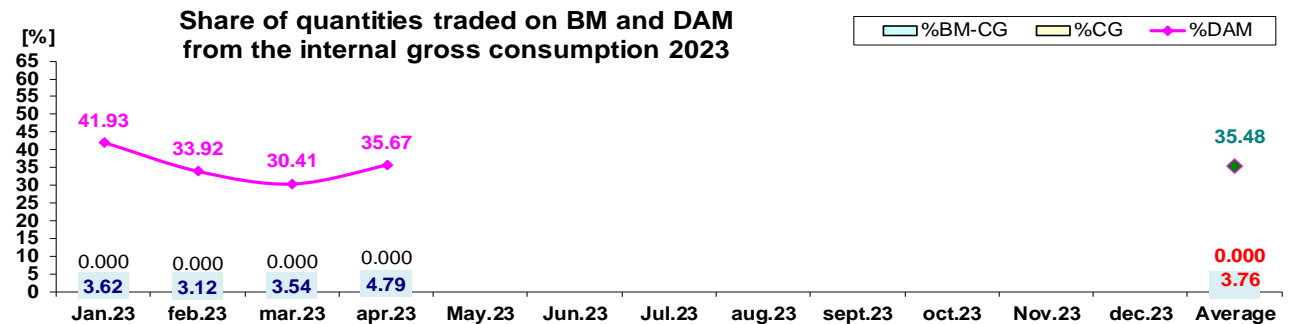
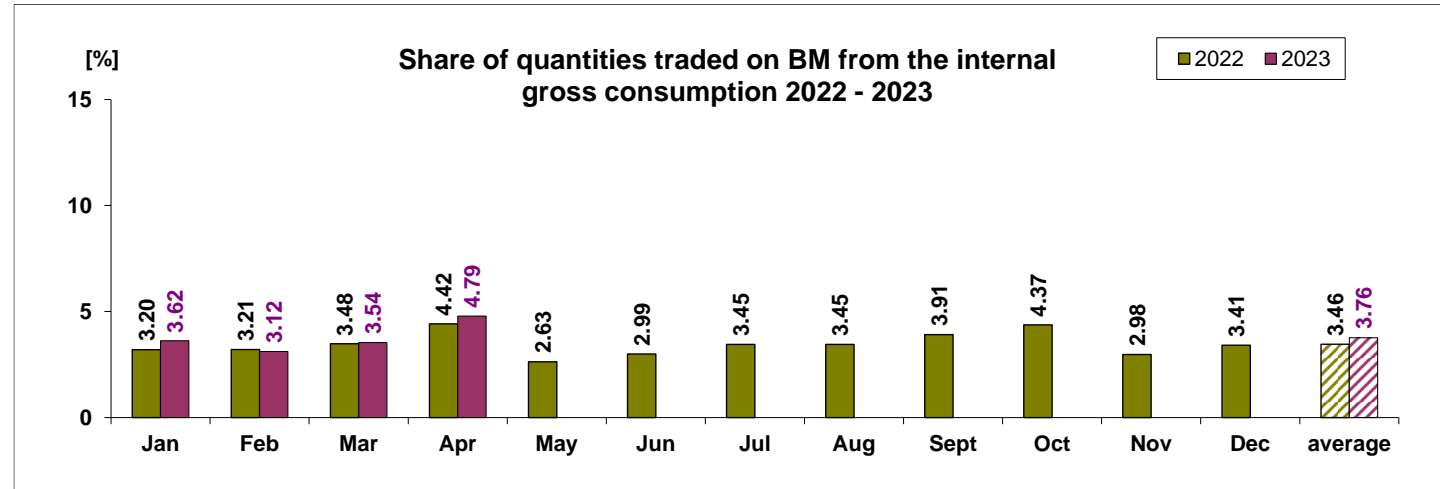
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# Balancing Market

## 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).



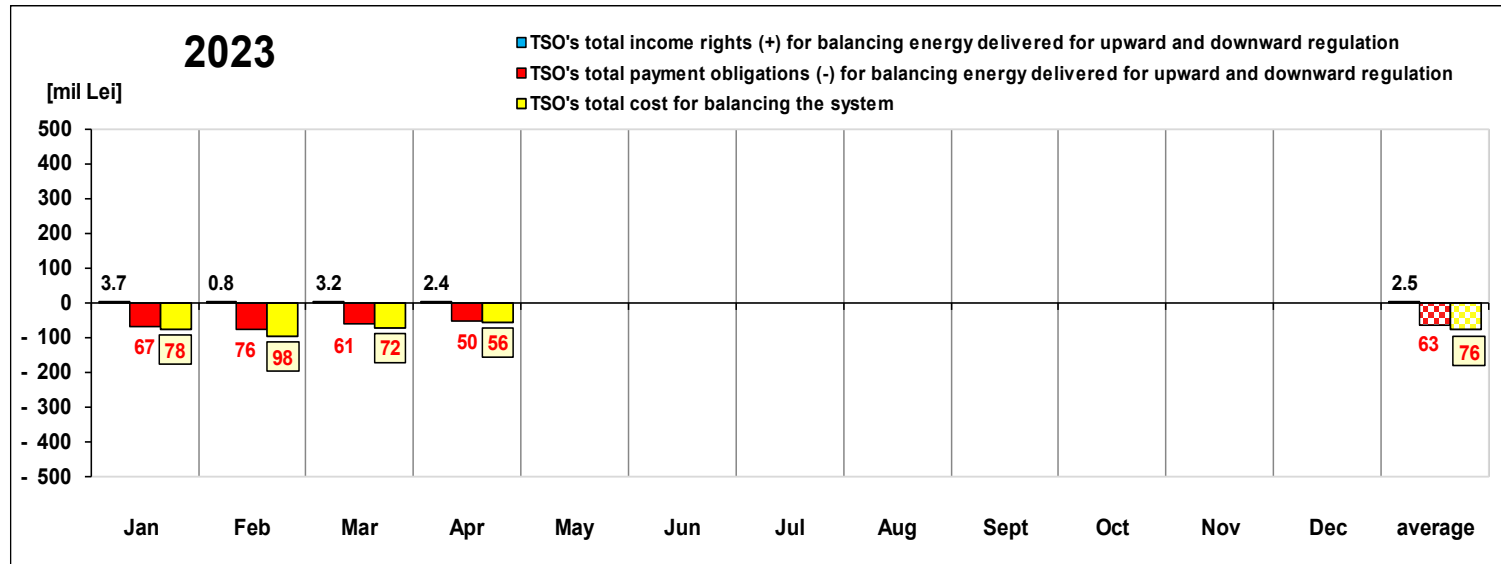
	2023												
	Jan.23	feb.23	mar.23	apr.23	May.23	Jun.23	Jul.23	aug.23	sept.23	oct.23	Nov.23	dec.23	Average
%BM	3.62	3.12	3.54	4.79									3.76
%DAM	41.93	33.92	30.41	35.67									35.48
%CG	0.000	0.000	0.000	0.000									0.000
%BM-CG	3.620	3.117	3.538	4.785									3.765
% outside BM	0.00	0.00	0.00	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	3 671 254	764 288	3 191 826	2 401 619									2 507 247	10 028 987
	payments (-) prices < 0	-18 058 105	-13 750 607	-2 780 494	-2 350 152									-9 234 839	- 36 939 358
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									-54 204 496	- 216 817 985
	incomes (+) prices < 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									2 507 247	10 028 987
TSO's total payment obligations (-) for		-67 017 580	-75 907 841	-60 664 291	-50 167 631									-63 439 336	- 253 757 343
TSO's total cost for balancing the system		-78 018 832	-97 917 681	-71 922 686	-55 930 994									-75 947 548	- 303 790 193
Value of transactions outside BM (with Congestion Cost on BM)		0	0	0	- 66 398									- 16 599	- 66 398
Congestion Cost outside BM		0	0	0	- 88 286									- 22 071	- 88 286

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

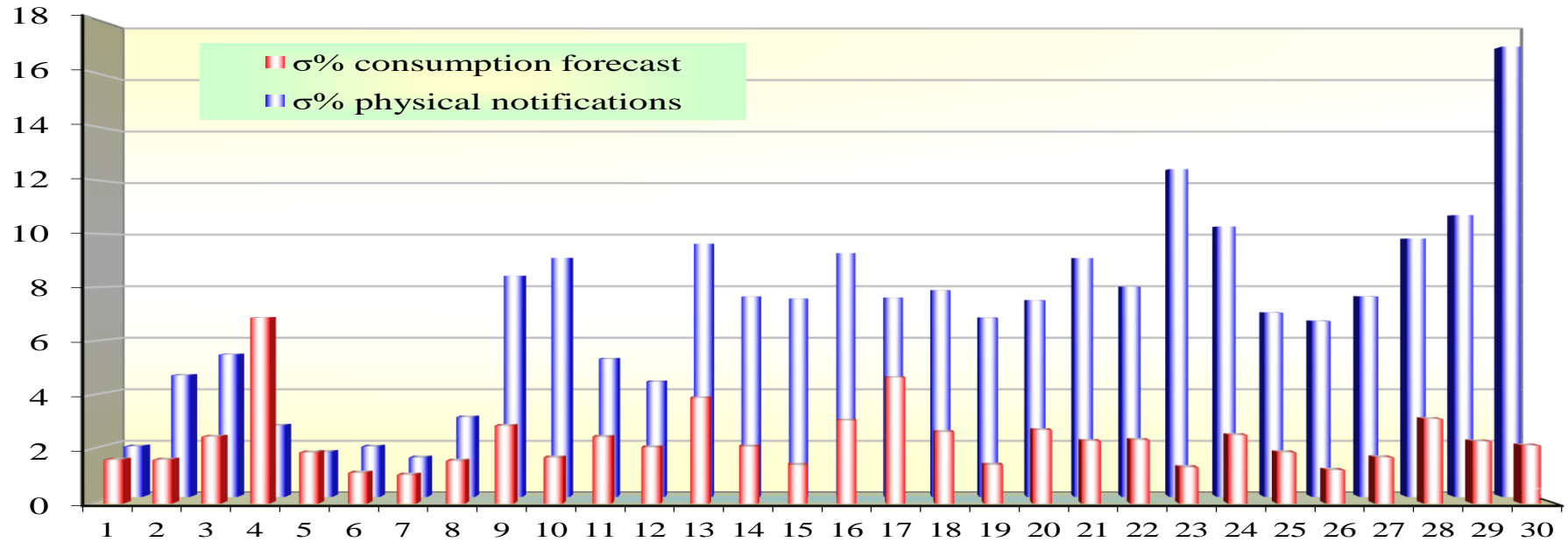


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# Balancing Market

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



apr 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	1.62	1.62	2.48	6.88	1.89	1.14	1.06	1.58	2.88	1.70	2.47	2.08	3.91	2.11	1.43	3.08	4.67	2.65	1.43	2.73	2.32	2.35	1.34	2.54	1.89	1.24	1.71	3.13	2.30	2.15
σ% physical notifications	1.92	4.63	5.42	2.71	1.71	1.91	1.49	3.03	8.41	9.10	5.25	4.38	9.64	7.62	7.54	9.28	7.57	7.86	6.81	7.48	9.09	7.99	12.48	10.29	7.01	6.69	7.63	9.83	10.73	17.14

σ<sub>average% consumption forecast</sub> = 2.12

σ<sub>average % physical notifications</sub> = 4.99

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

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

**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 77 BRPs, 90 market participants, holding 179 commercially operating dispatchable units. Starting with 1<sup>st</sup> of April and 26<sup>th</sup> of April 2023, according to NRA Order no 213/2020, with subsequent amendments and completions, BRPs NOVA POWER & GAS SOLAR PRODUCTION (PROBE) (30XRONPGSP-----8) (01.04), as a result of starting trial period of solar production unit NERVIA etapa II-probe, CLUSTER POWER (PROBE) (30XRO-CPOWER---0) (26.04), as a result of starting trial period of gas production unit CLUSTER\_PROBE and ENERGO NATUR DRAGHINEASCA (PROBE) (30XRO-ENERGONAT1) (26.04) as a result of starting trial period of solar production unit RASCAETI\_PROBE.

April 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	-4.15	0.10	-100.00	31581.40	31581.40	0.00%	2	72.40%	100%	72.40%	100%	6003	6003
Fast Tertiary	1.91	115.20	-175.00	148052.92	143492.25	3.08%	6	50.34%	98.32%	51.39%	98.33%	4678	4688
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-	-
				179634.32	175073.66	2.54%							

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	1985.38	2000.00	1000.00	11923.48	11923.48	0.00%	2	73.10%	100%	73.10%	100%	6067	6067
Fast Tertiary	1051.72	1433.21	548.06	23358.79	22965.75	1.68%	4	87.57%	97.03%	87.73%	97.01%	7724	7750
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-	-
				35282.27	34889.24	1.11%							

apr.23

Downward Regulation

	Quantities outside BM (with financial compensation)			Participants	
	Selected	Actually Delivered	Undelivered	Number	
	[MWh]	[MWh]	[%]		
Fast Tertiary	190.00	171.53	9.72%	2	





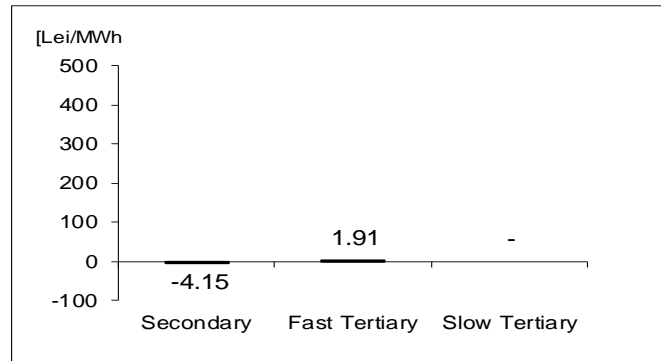
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# Balancing Market

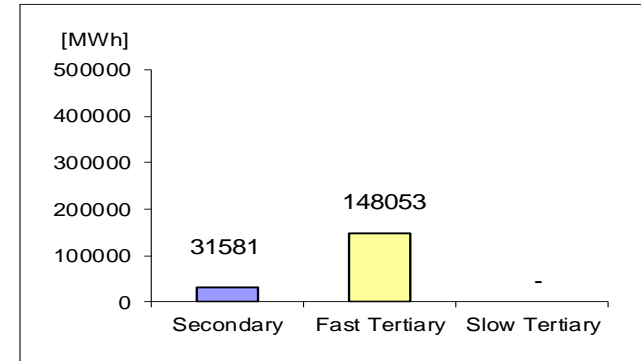
## Balancing energy – Selected prices and quantities in April 2023

April 2023

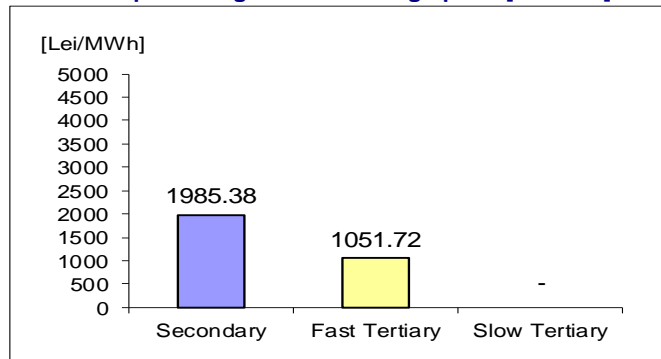
Downward regulation - average price [lei/MWh]



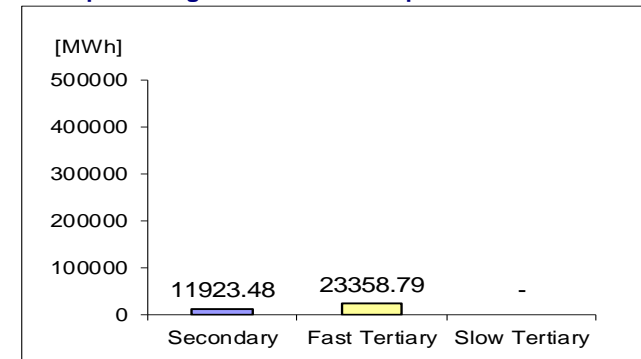
Downward regulation - selected quantities



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  $i$ .

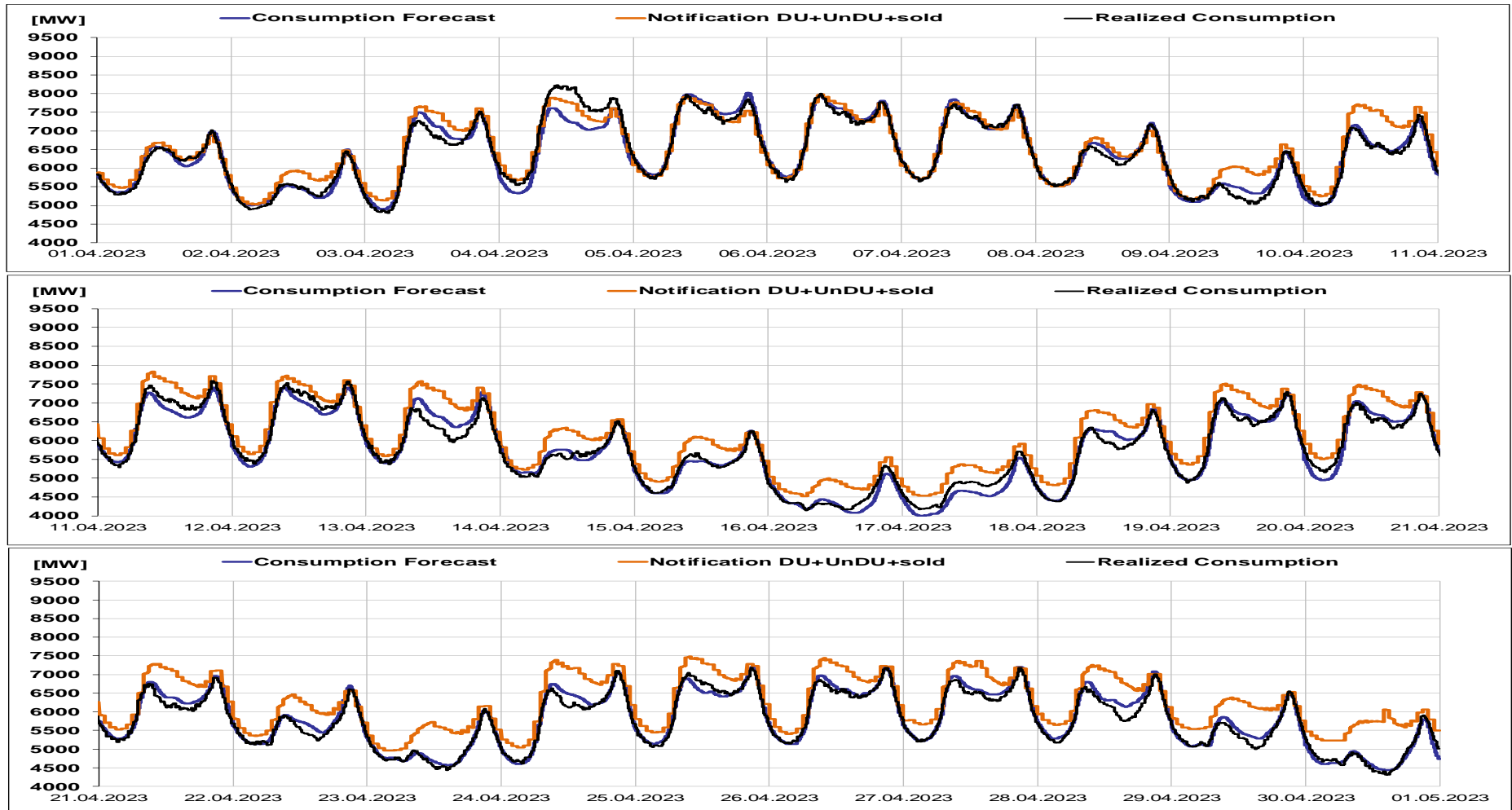


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# Balancing Market

## Realized consumption, forecast, notifications in D-1



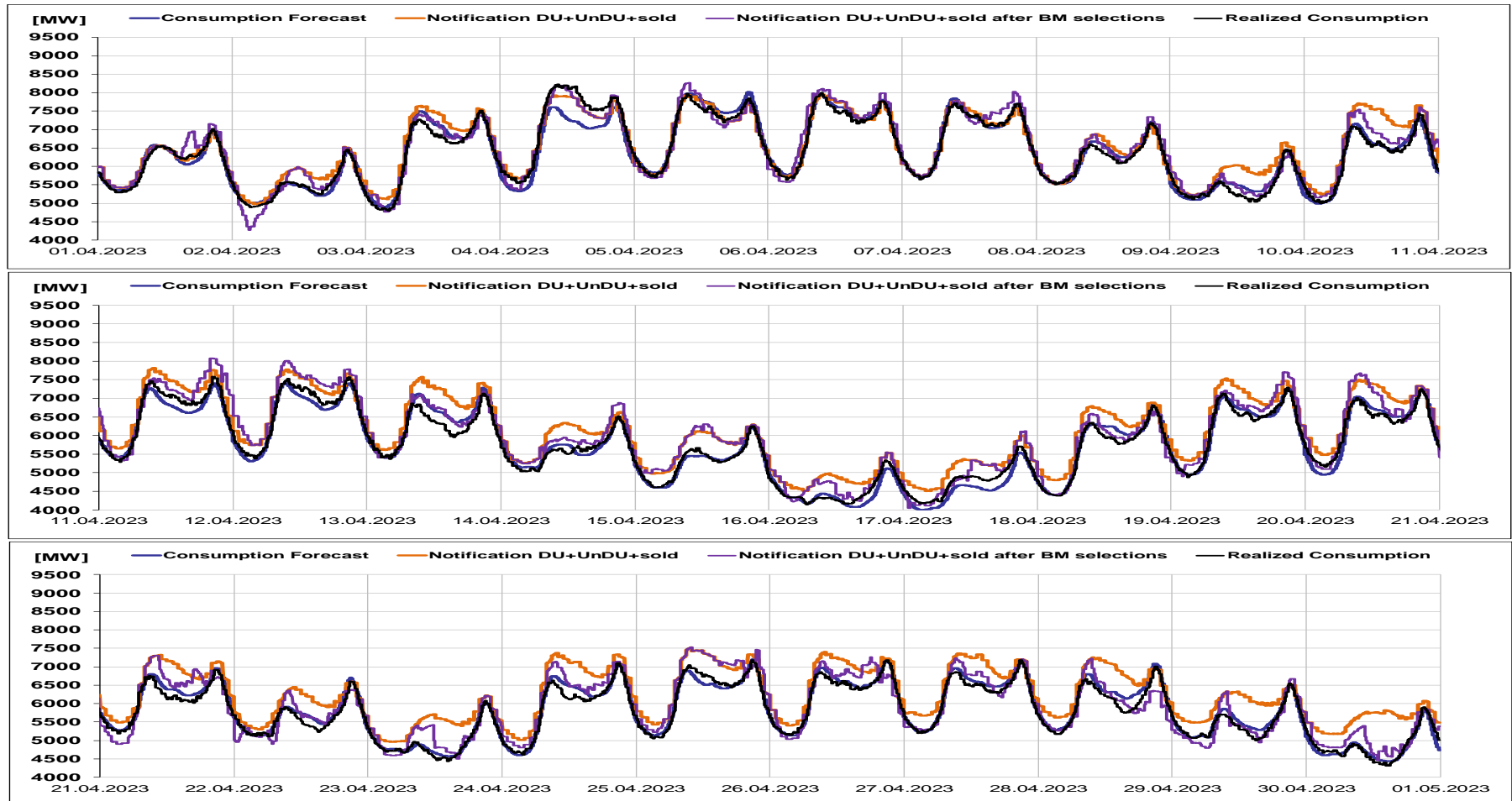


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# Balancing Market

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



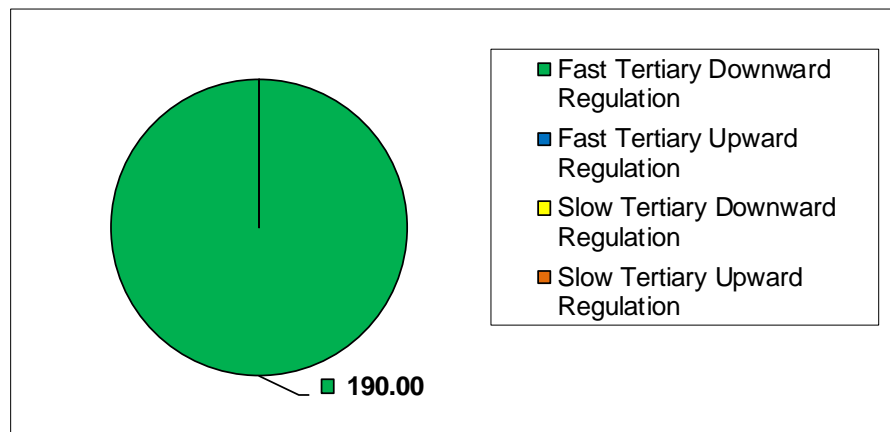
## Congestion Management

Transactions outside BM  
(financial compensation)  
Participants

**April 2023**

	Selected [MWh]	Actually Delivered	Number
Fast Tertiary Downward Regulation	190.00	171.53	2
Fast Tertiary Upward Regulation	0.00	-	0
Slow Tertiary Downward Regulation	0.00	-	0
Slow Tertiary Upward Regulation	0.00	-	0
	190.00	171.53	

### 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.



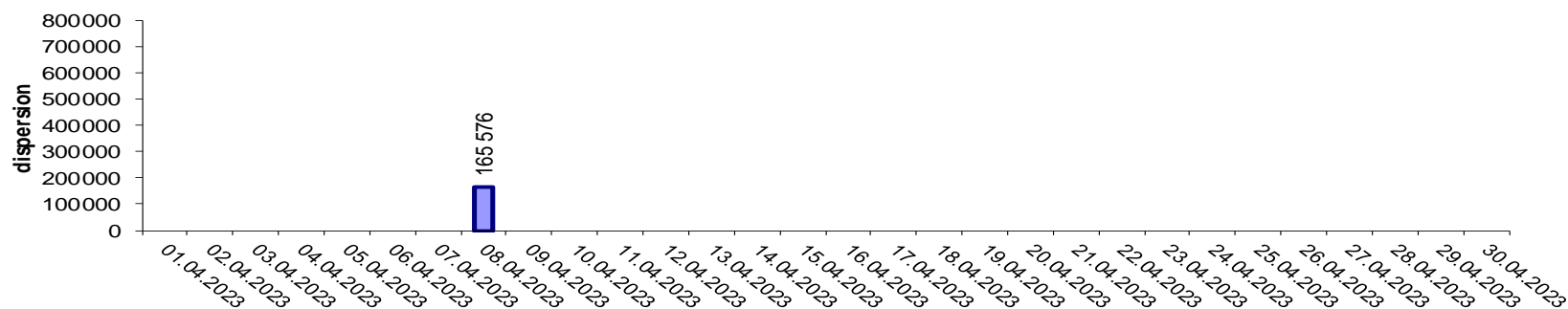
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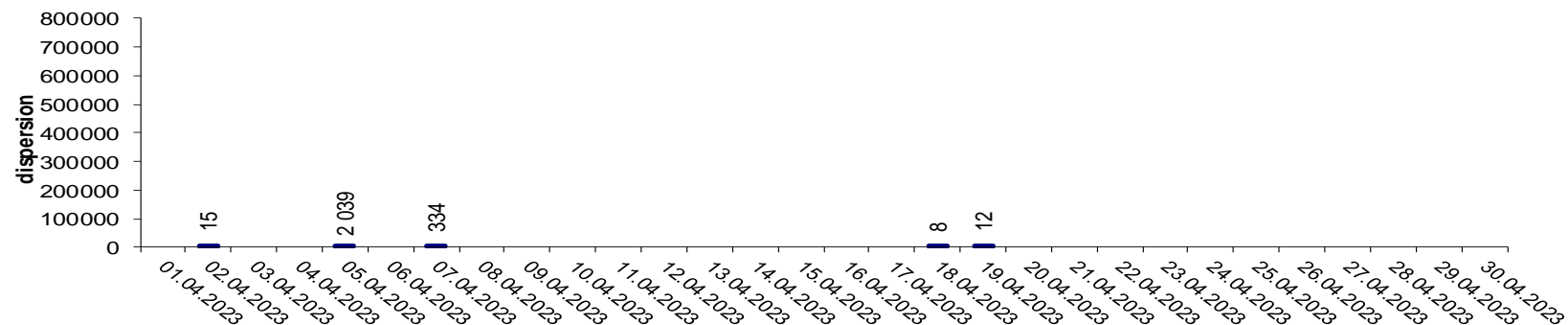
# Balancing Market

## 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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