



**Transelectrica®**  
Societate Administrată în Sistem Dualist

# **MARKET MONITORING REPORT**

## **Balancing Market**

### **December 2022**

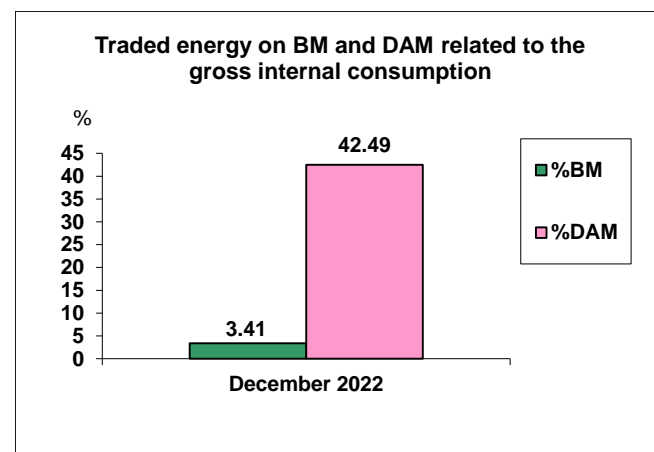
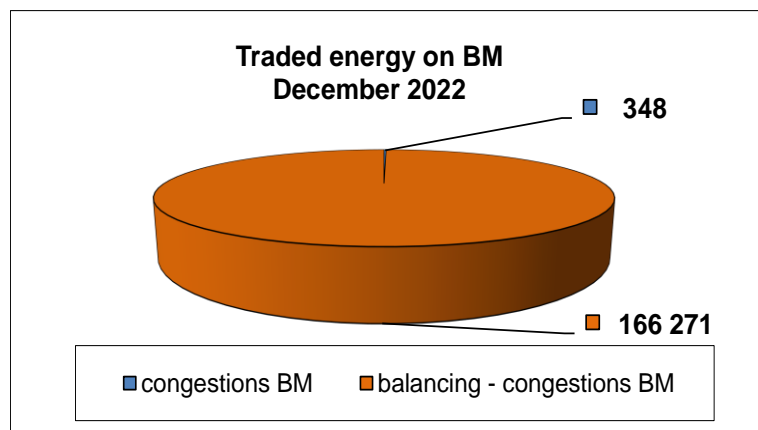
ANRE - Romanian Energy Regulatory Authority  
HHI - Herfindahl-Hirschman Index  
BRP - Balance Responsible Party  
BM - Balancing Market  
BMP – Balancing Market Participant  
DAM - Day Ahead Market  
TSO - Transmission System Operator  
DU – Dispatchable Unit  
PN – Physical Notification  
NDC - National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

## The Balance Generation/Consumption

- The average monthly value of generated power was de 6 650 MW and the actual internal gross consumption was 6 559 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being **2.01%**. 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 **3.54%**. The greatest daily deviation regarding the notifications was registered on the 26<sup>th</sup> of December (**8.47%**).
- The energy used in December 2022 for balancing the power system and congestion management was 166 619 MWh (with an average power of 224 MW, which means **3.41%** from the internal gross consumption). The energy used for congestion management was 347.92 MWh (with an average power of 0.47 MW, which means 0.0071% from the internal gross consumption).
- The energy used for congestion management outside BM (with financial compensation) was 19.25 MWh.
- The energy used in December 2022 on Day Ahead Market was de 2 073 462 MWh (with an average power of 2 787 MW, which means **42.49%** from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 187 573 520 lei (with an average weighted price of 1 125.76 lei/MWh). The value of transactions outside the balancing market (with financial compensation) was – 23 608 lei (weighted average price – 1 226.41 lei/MWh). The cost for congestion management, paid by CNTEE Transelectrica S.A., was 122 314 lei.





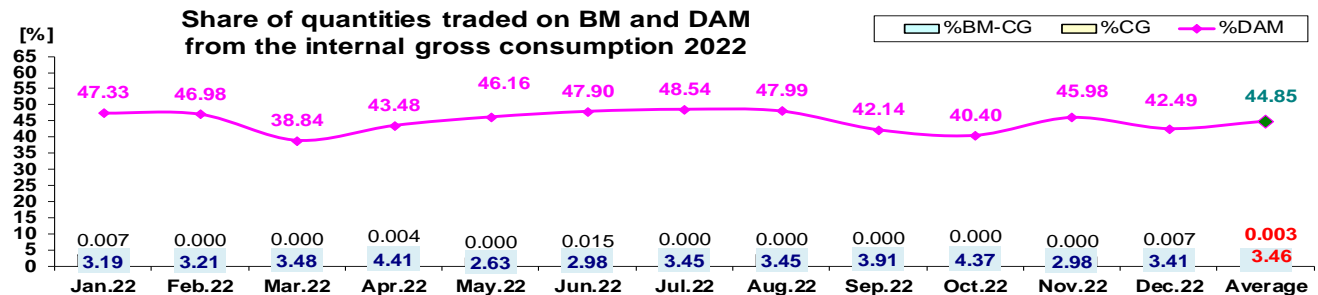
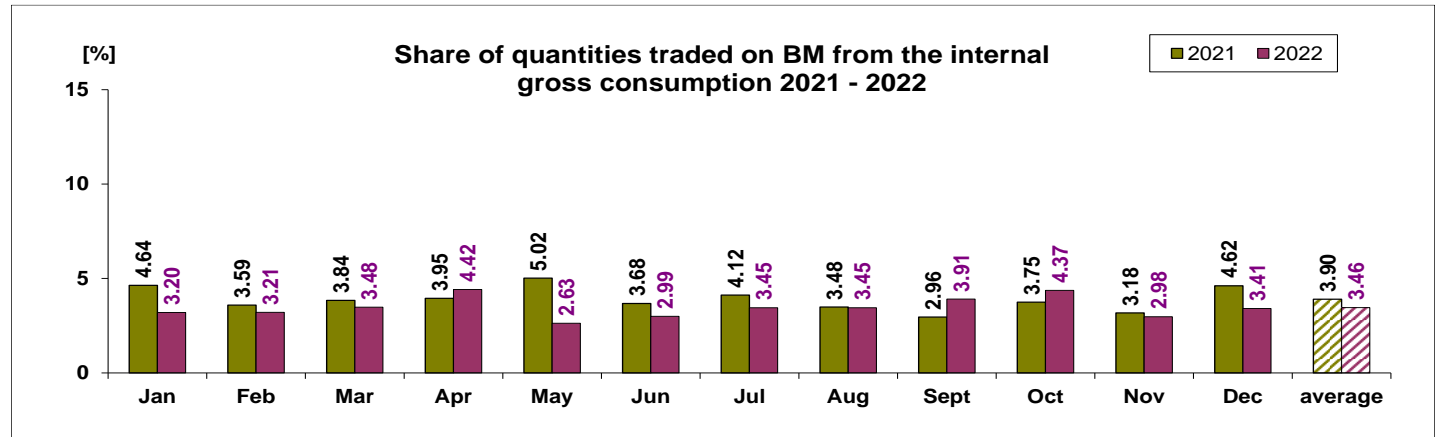
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# Balancing Market

## 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).



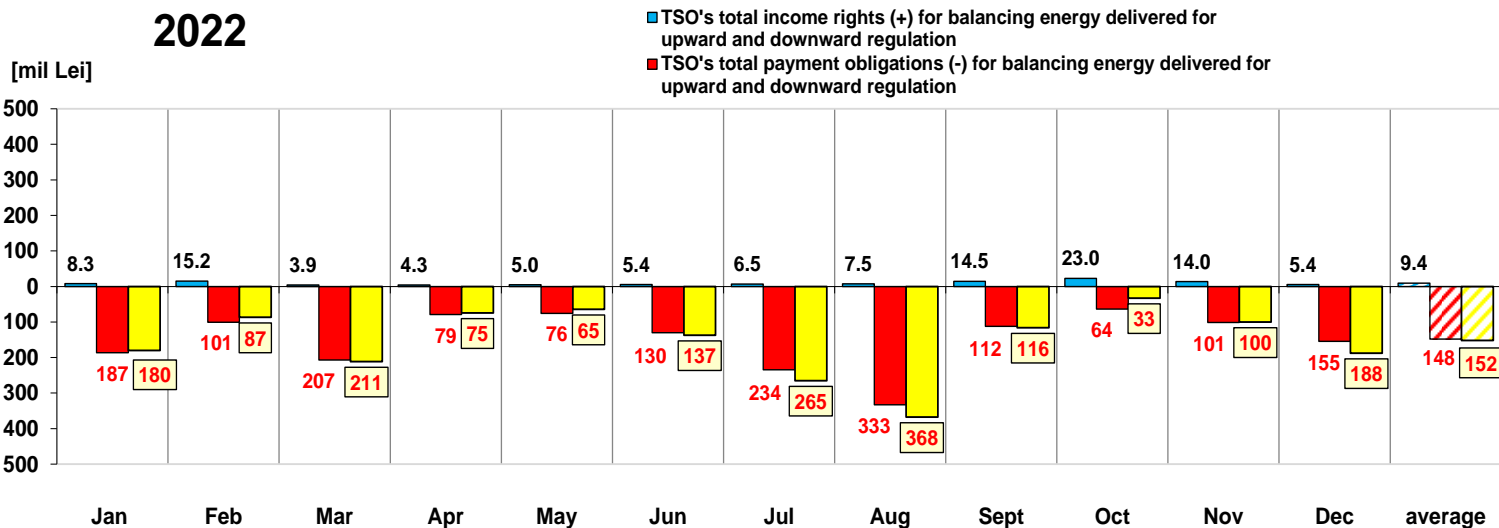
	2022												
	Jan.22	Feb.22	Mar.22	Apr.22	May.22	Jun.22	Jul.22	Aug.22	Sep.22	Oct.22	Nov.22	Dec.22	Average
%BM	3.20	3.21	3.48	4.42	2.63	2.99	3.45	3.45	3.91	4.37	2.98	3.41	3.46
%DAM	47.33	46.98	38.84	43.48	46.16	47.90	48.54	47.99	42.14	40.40	45.98	42.49	44.85
%CG	0.007	0.000	0.000	0.004	0.000	0.015	0.000	0.000	0.000	0.000	0.000	0.007	0.0028
%BM-CG	3.191	3.206	3.479	4.412	2.631	2.979	3.452	3.448	3.912	4.374	2.977	3.407	3.456
% outside BM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.0004	0.00



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# Balancing Energy Market Transactions

**2022**



[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	5 378 240	9 416 329	112 995 950
	payments (-) prices < 0	- 40 999	- 12 132	- 96 136	- 131 045	- 1 648	- 22 991	- 374	- 15 549	- 3 839	-11 358 266	0	- 817 767	-1 041 729	-12 500 746
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	-153 791 756	-147 205 343	-1766 464 115
	incomes (+) prices < 0	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	5 378 240	9 416 329	112 995 950
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	-154 609 523	-148 247 072	-1778 964 861
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	-187 573 520	-151 992 088	-1823 905 061
Value of transactions outside BM (with financial		0	0	0	0	0	0	0	0	0	0	0	- 23 608	- 1 967	- 23 608
Congestion Cost on BM		- 157 055	0	- 3 224	- 30 924	0	- 29 640	0	0	0	0	0	- 122 314	- 28 596	- 343 157
Congestion Cost outside BM		0	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.

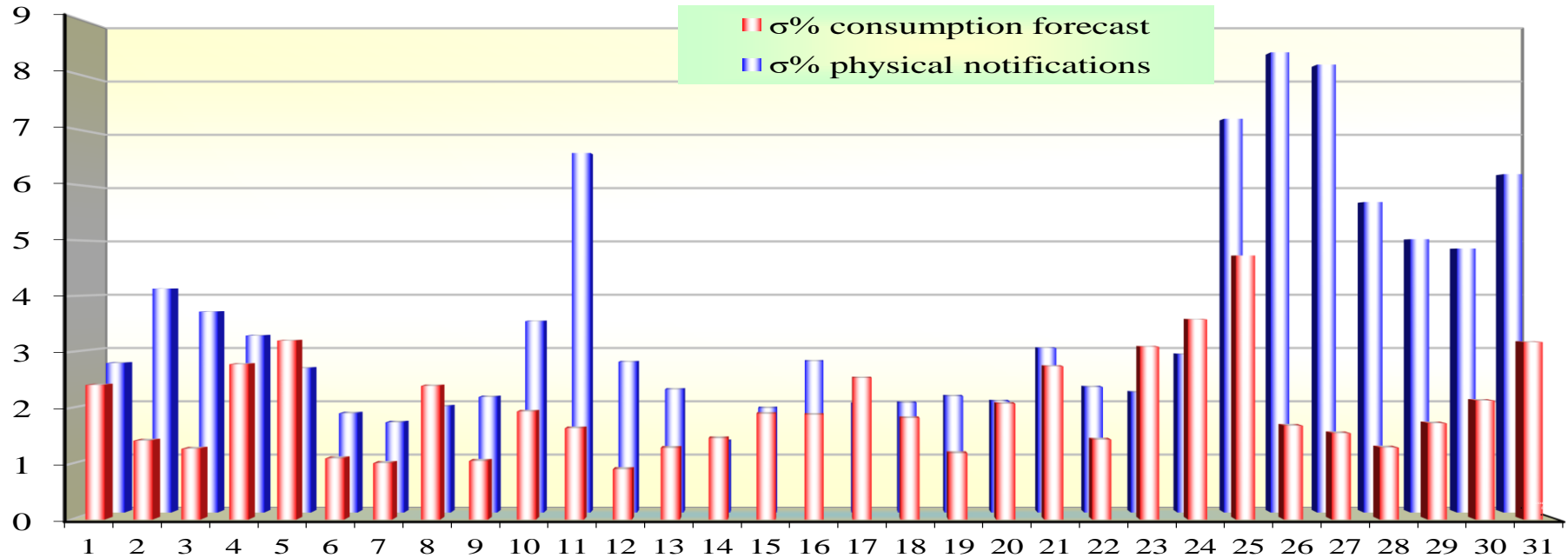


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# Balancing Market

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



Dec 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	31
σ% consumption forecast	2.41	1.41	1.27	2.78	3.20	1.09	1.01	2.39	1.05	1.93	1.63	0.90	1.28	1.45	1.89	1.88	2.53	1.82	1.19	2.07	2.74	1.43	3.09	3.58	4.73	1.68	1.54	1.29	1.72	2.13	3.18
σ% physical notifications	2.75	4.12	3.70	3.26	2.66	1.83	1.66	1.96	2.13	3.52	6.62	2.77	2.27	1.31	1.92	2.79	2.00	2.02	2.14	2.05	3.03	2.31	2.21	2.91	7.25	8.47	8.25	5.72	5.03	4.86	6.23

σ<sub>average% consumption forecast</sub> = 2.01

σ<sub>average % physical notifications</sub> = 3.54

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

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

**R = Realized Consumption;**

**N = Physical Notifications;**

**P = Consumption Forecast.**

Public

# Balancing Market

## Balancing energy – Selected prices and quantities

• At the beginning of the month on the Balancing Market operated 75 BRPs, 90 market participants, holding 177 commercially operating dispatchable units. Starting with 1<sup>st</sup> of December 2022 BMP ARINNA DEVELOPMENT S.A. (30X-ARINNA-----J) was removed from the BMP list. Starting with 10<sup>th</sup> of December 2022, following Emergency Ordinance no. 153/2022, which introduced a mechanism of centralized purchase of electricity, was registered as a separate BRP OPERATOR OF THE ELECTRICITY AND NATURAL GAS MARKET "OPCOM" S.A. (30XOPCOM-MCAEE-G). Starting with 21<sup>st</sup> of December, according to the provisions of NRA Order no. 213/2020, amended and supplemented by NRA Order no. 33/2021, was removed from the BRP list, NOVA POWER & GAS (probe), as a result of the end of the trial period at the CAMPIA\_TURZII2 production unit and BRP NOVA POWER & GAS SOLAR PRODUCTION (probe) (30XRONPGSP-----8) was registered as a result of the start of the trial period for the NERVIA solar production unit.

### December 2022

#### 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	-1.92	0.10	-10.00	29481.55	29481.55	0.00%	3	66.65%	100%	66.65%	100%	5484
Fast Tertiary	75.77	315.00	-166.00	62272.21	60424.22	2.97%	12	35.58%	94.04%	35.08%	94.36%	3017
Slow Tertiary	53.10	53.10	53.10	117.70	114.73	2.52%	3	96.47%	100%	96.39%	100%	9313
				91871.46	90020.50	2.01%						5484

#### 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	2538.64	4500.00	1100.00	15566.79	15566.79	0.00%	3	69.37%	100%	69.37%	100%	5663
Fast Tertiary	1871.94	3937.00	0.10	61545.43	61031.45	0.84%	5	95.08%	99.48%	95.08%	99.49%	9056
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-
				77112.22	76598.24	0.67%						5663

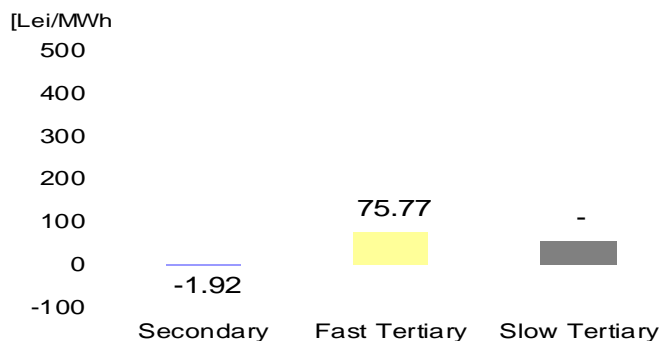


# Balancing Market

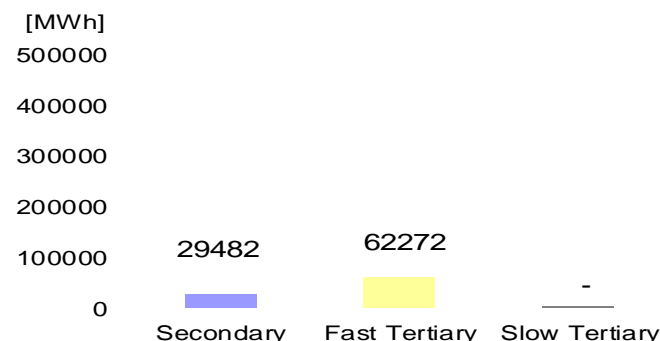
## Balancing energy – Selected prices and quantities

December 2022

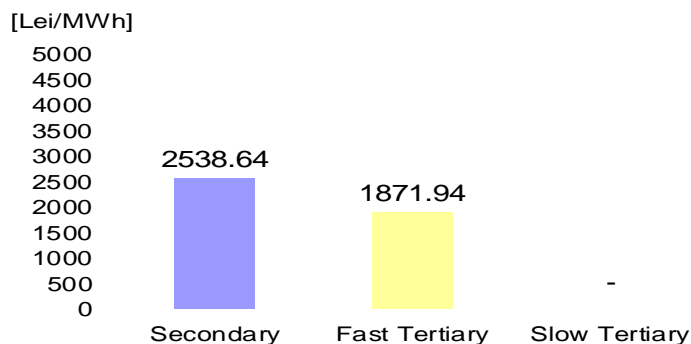
Downward regulation - average price [lei/MWh]



Downward regulation - selected quantities



Upward regulation - average price [lei/MWh]



Upward regulation - selected quantities



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  $i$ .

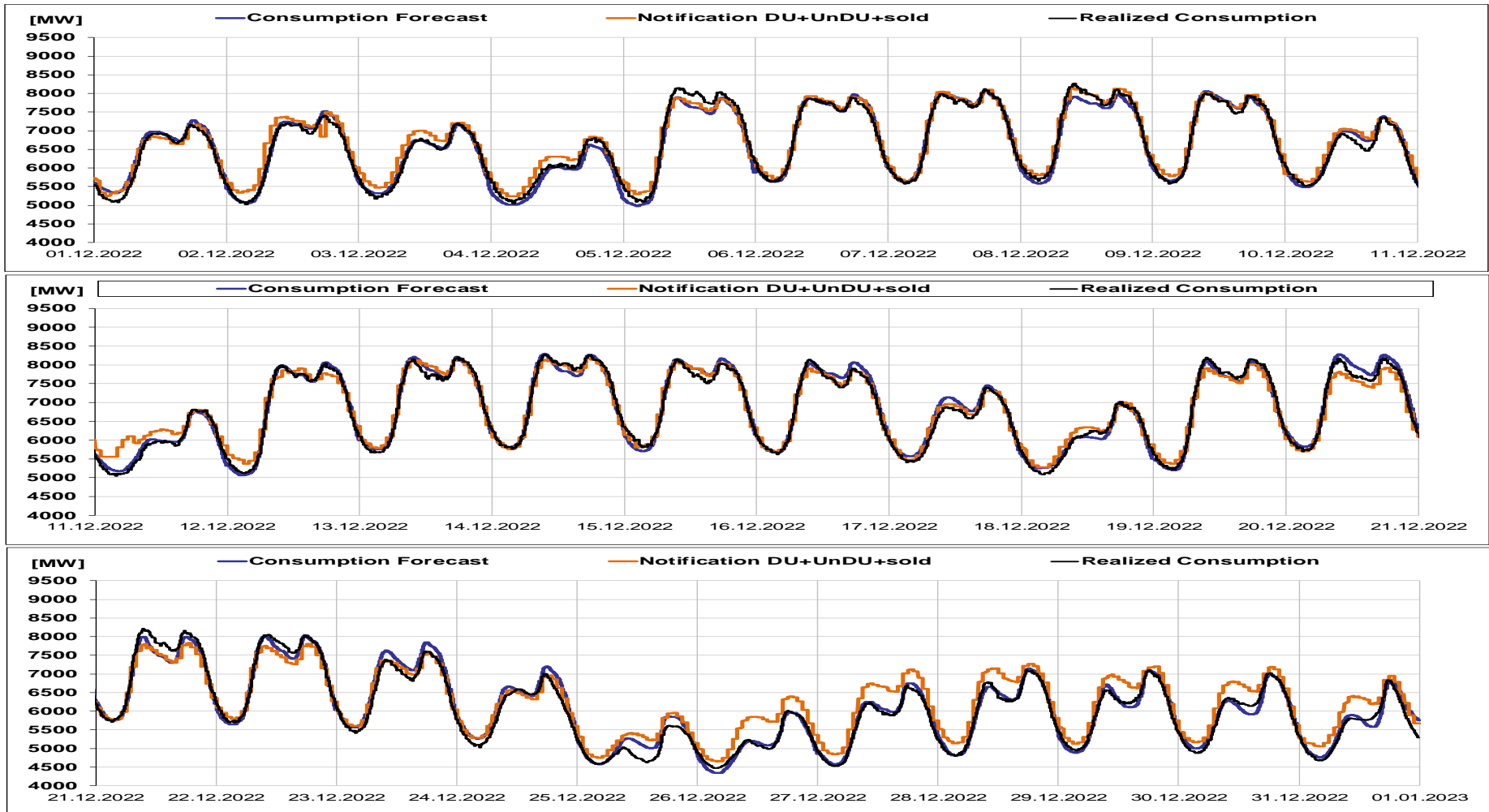


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# Balancing Market

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



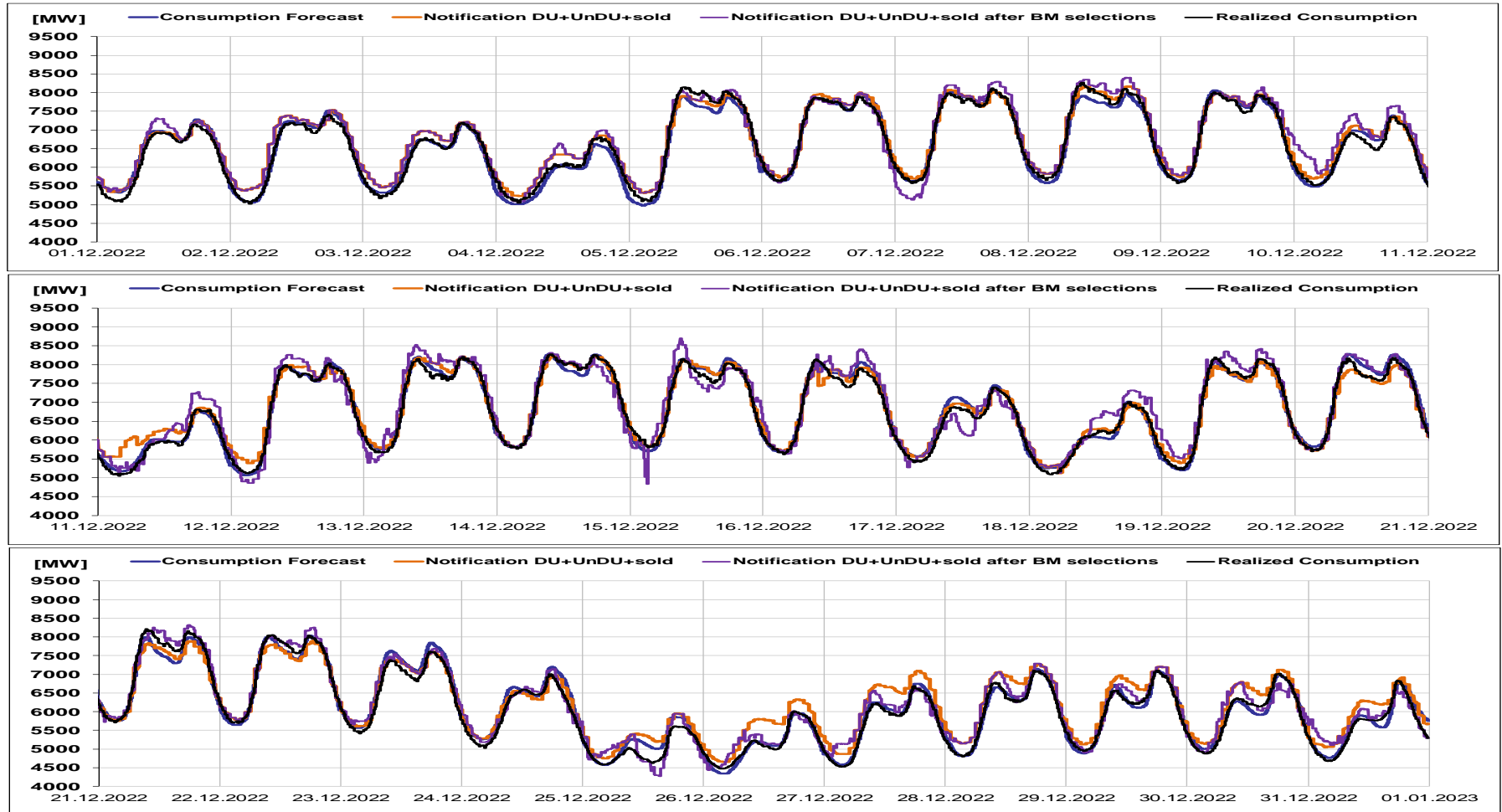


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# Balancing Market

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



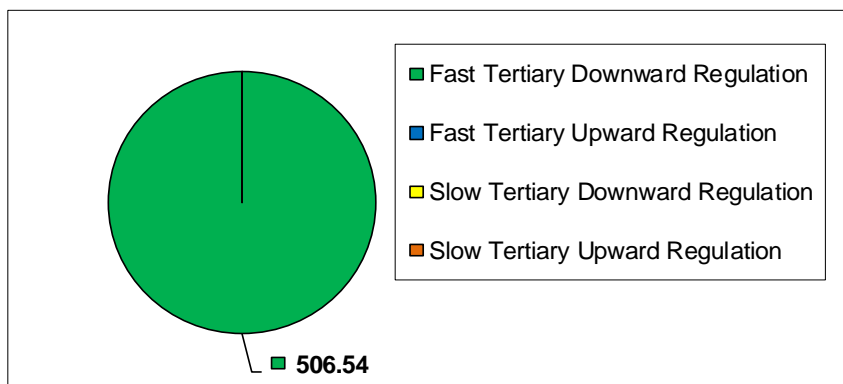
# Balancing Market

## Congestion Management

December 2022

	Quantities [MWh]		Participants Number
	Selected [MWh]	Actually Delivered	
Fast Tertiary Downward Regulation	506.54	347.92	4
Fast Tertiary Upward Regulation	0.00	-	0
Slow Tertiary Downward Regulation	0.00	-	0
Slow Tertiary Upward Regulation	0.00	-	0
	506.54	347.92	

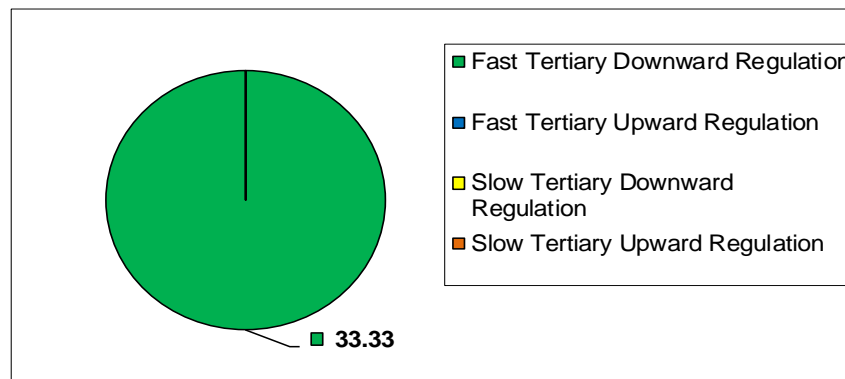
Selected energy [MWh]



December 2022

	Transactions outside BM (financial compensation)		Participants Number
	Selected [MWh]	Actually Delivered	
Fast Tertiary Downward Regulation	33.33	19.25	2
Fast Tertiary Upward Regulation	0.00	-	0
Slow Tertiary Downward Regulation	0.00	-	0
Slow Tertiary Upward Regulation	0.00	-	0
	33.33	19.25	

Selected energy [MWh]



The value of the delivered energy related to the final transactions for the management of internal congestions is the one resulting from the application of the algorithm for determining the costs for system balancing and for management of internal congestions from the settlement stage on the BM.



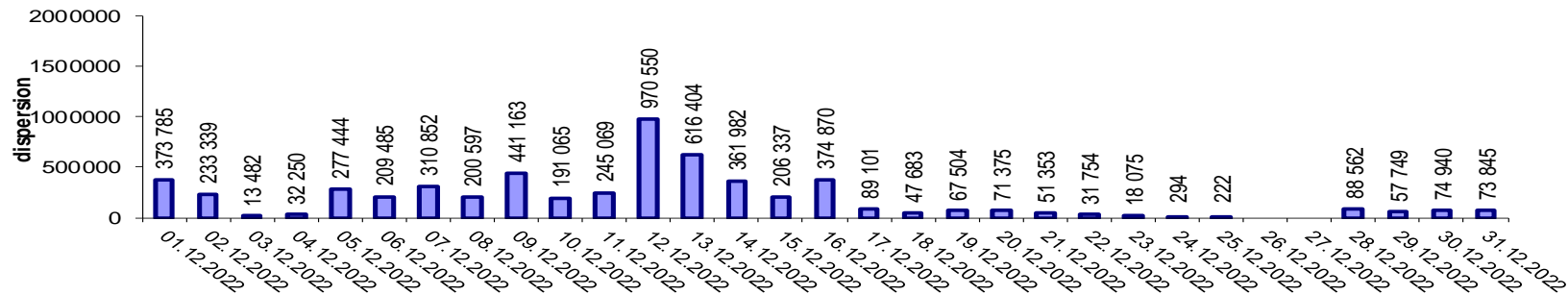
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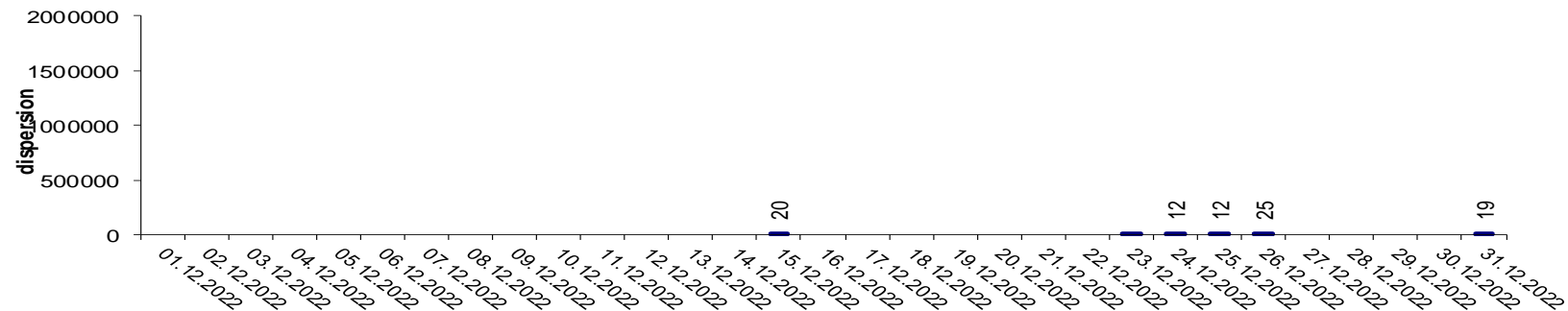
# Balancing Market

## 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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