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Societate Administrată în Sistem Dualist

# **MARKET MONITORING REPORT**

## **Balancing Market**

### **April 2021**

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

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).



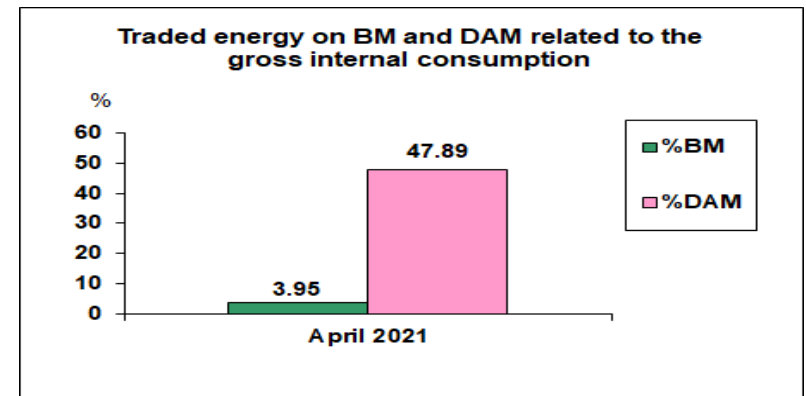
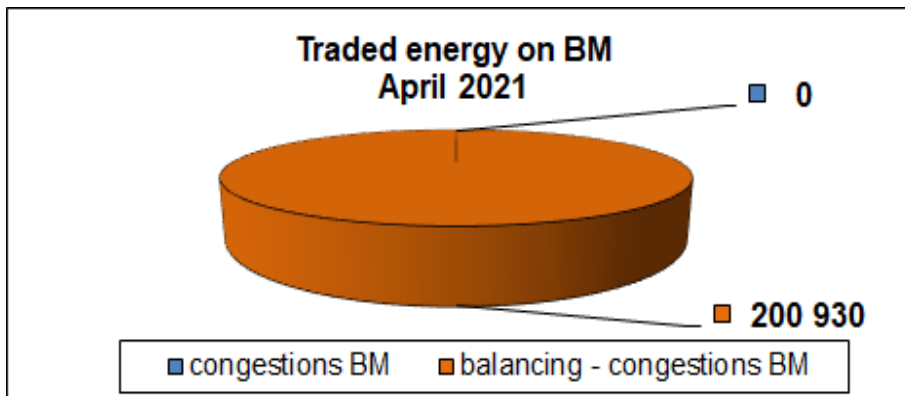
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# Balancing Market

## The Balance Generation/Consumption

- The average monthly value of generated power was 6 853 MW and the actual internal gross consumption was 7 070 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being **1.76%**. 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 **3.55%**. The greatest daily deviation regarding the notifications was registered on 25<sup>th</sup> of April (**7.53%**).
- The energy used in April 2021 for balancing the power system and congestion management was 200 930 MWh (with an average power of 279 MW, which means **3.95%** from the internal gross consumption).
- There were no network congestion management transactions.
- There were no transactions outside BM (with financial compensation).
- The energy used in April 2021 on Day Ahead Market was 2 437 971 MWh (with an average power of 3 386 MW, which means **47.89%** from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 47 412 381 lei (with an average weighted price of 235.96 lei/MWh).



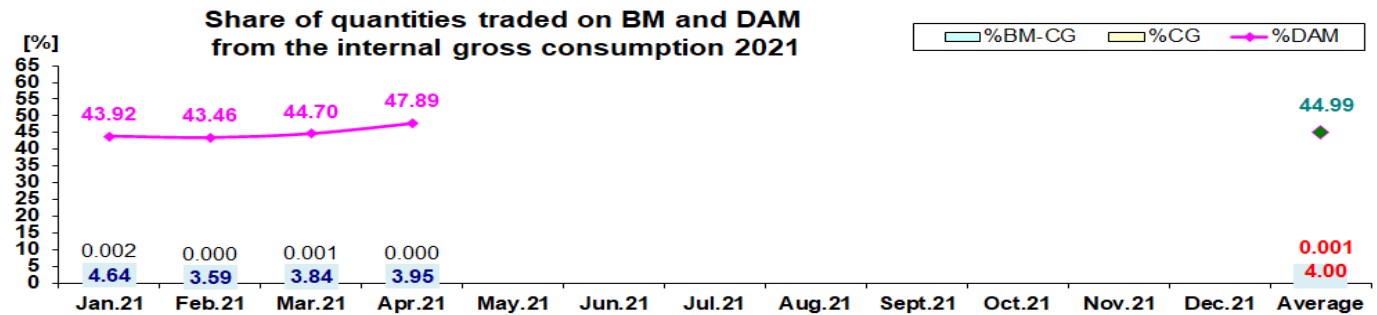
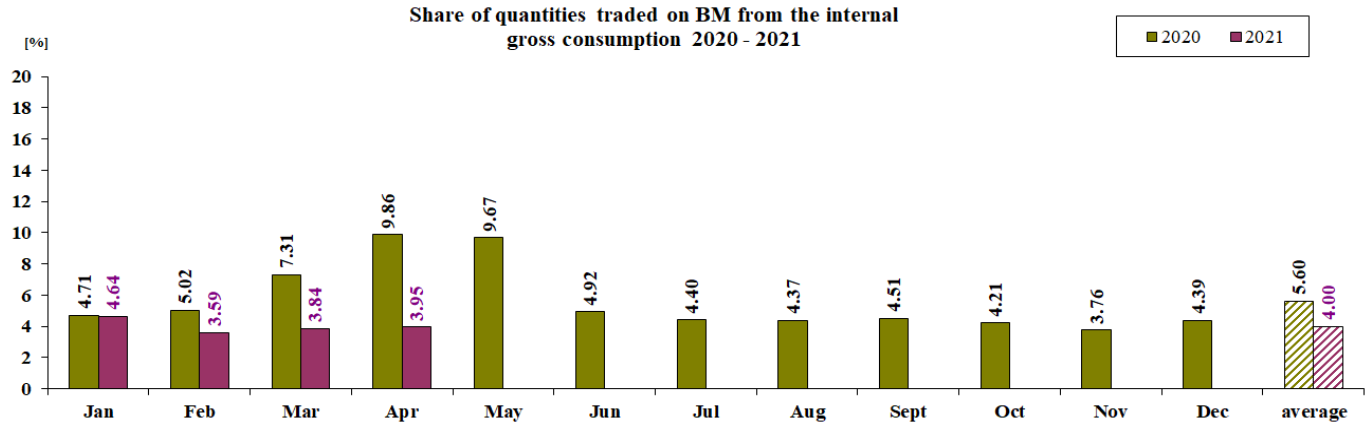


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# Balancing Market

## 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).



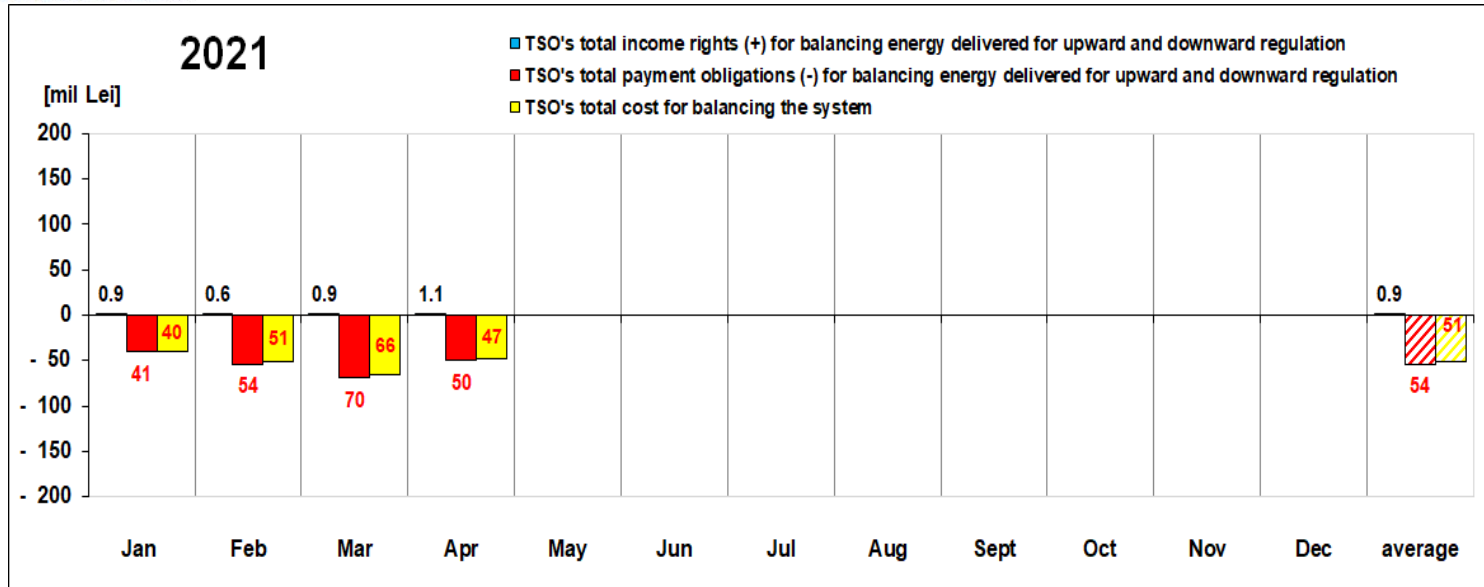
	2021												
	Jan.21	Feb.21	Mar.21	Apr.21	May.21	Jun.21	Jul.21	Aug.21	Sept.21	Oct.21	Nov.21	Dec.21	Average
%BM	4.64	3.59	3.84	3.95									4.00
%DAM	43.92	43.46	44.70	47.89									44.99
%CG	0.002	0.000	0.001	0.000									0.001
%BM-CG	4.636	3.592	3.836	3.947									4.003
% outside BM	0.02	0.00	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	878 222	633 581	912 692	1 127 724									888 055	3 552 220
	payments (-) prices < 0	- 367 742	- 8 158	- 280 354	- 849 859									- 376 528	- 1 506 112
TSO's payment obligations / income rights for balancing energy delivered for upward regulation	payments (-) prices ≥ 0	-40 134 420	-54 045 144	-69 270 145	-49 547 577									-53 249 322	- 212 997 286
	incomes (+) prices < 0	0	0	0	0									0	0
TSO's total income rights (+) for balancing		878 222	633 581	912 692	1 127 724									888 055	3 552 220
TSO's total payment obligations (-) for		-40 502 162	-54 053 301	-69 550 500	-50 397 436									-53 625 850	- 214 503 399
TSO's total cost for balancing the system		-39 649 686	-50 861 284	-65 692 590	-47 412 381									-50 903 985	- 203 615 941
Value of transactions outside BM (with financial compensation)		- 25 803	0	0	0									- 6 451	- 25 803
Congestion Cost on BM		- 56	0	- 121	0									- 44	- 177
Congestion Cost outside BM		0	0	0	0									0	0

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

Public

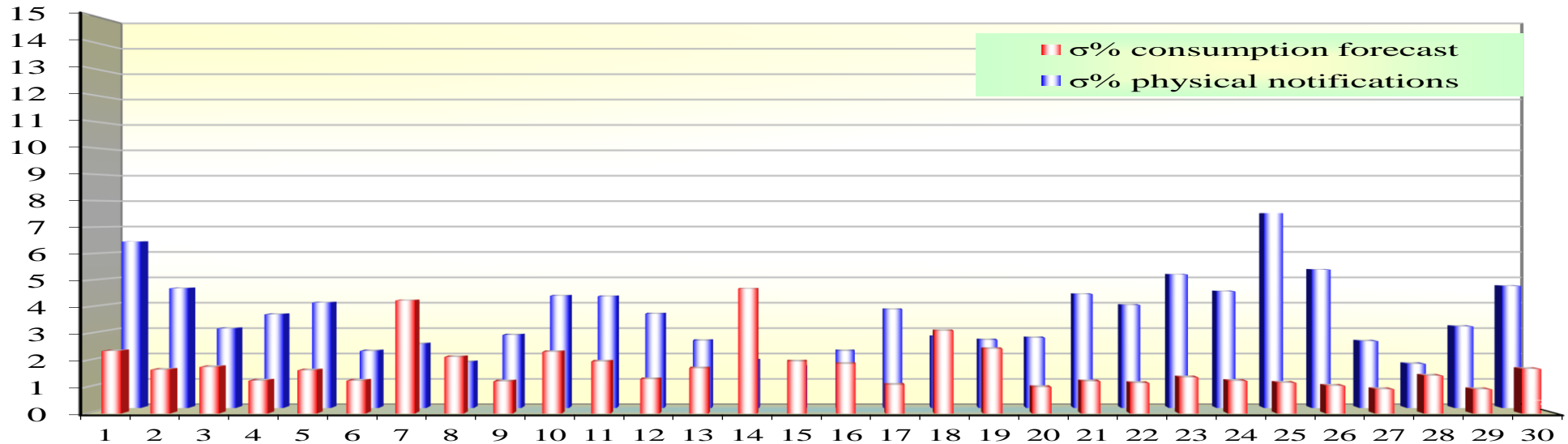


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# Balancing Market

Standard deviation of physical notifications and consumption forecast against the actual consumption in April 2021



apr 2021

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	2.35	1.65	1.75	1.23	1.62	1.23	4.25	2.13	1.21	2.32	1.95	1.29	1.70	4.69	1.96	1.87	1.08	3.11	2.43	0.99	1.21	1.15	1.36	1.22	1.15	1.04	0.91	1.42	0.91	1.68
σ% physical notifications	6.43	4.62	3.07	3.62	4.07	2.20	2.47	1.77	2.82	4.33	4.31	3.64	2.60	1.84	1.59	2.20	3.81	2.75	2.63	2.71	4.40	3.98	5.16	4.50	7.53	5.35	2.58	1.70	3.15	4.71

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

**R = Realized Consumption;**

**N = Physical Notifications;**

**P = Consumption Forecast.**

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

**σ<sub>average% consumption forecast</sub> = 1.76**

**σ<sub>average % physical notifications</sub> = 3.55**

Public

# Balancing Market

## Balancing energy – Selected prices and quantities

- At the beginning of the month on the Balancing Market operated 69 BRPs, 99 market participants, holding 193 commercially operating dispatchable units.

April 2021

### Downward Regulation

Downward Regulation	Prices [lei/MWh]			Quantities [MWh]			Participants						
	Weighted Average	Maximum	Minimum	Selected	Actually Delivered	Deviation	Number	C1	C3	C1	C3	HHI	HHI
	[lei/MWh]	[lei/MWh]	[lei/MWh]	[MWh]	[MWh]	[%]		(selected)		(actually delivered)		(selected)	(actually delivered)
Secondary	0.01	0.10	-10.00	51346.29	51346.29	0.00%	3	68.36%	100%	68.36%	100%	5292	5292
Fast Tertiary	2.92	54.00	-165.00	94597.86	90915.11	3.89%	14	39.84%	96.61%	39.85%	96.61%	3434	3433
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-	-
				145944.15	142261.40	2.52%							

### Upward Regulation

	Weighted Average	Maximum	Minimum	Selected	Actually Delivered	Deviation	Number	C1	C3	C1	C3	HHI	HHI
	[lei/MWh]	[lei/MWh]	[lei/MWh]	[MWh]	[MWh]	[%]		(selected)		(actually delivered)		(selected)	(actually delivered)
Secondary	879.13	1044.98	500.00	29940.18	29940.18	0.00%	3	67.52%	100%	67.52%	100%	5215	5215
Fast Tertiary	807.97	1043.98	449.00	29980.99	28728.65	4.18%	6	53.27%	84.46%	54.36%	84.28%	3543	3602
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-	-
				59921.17	58668.83	2.09%							





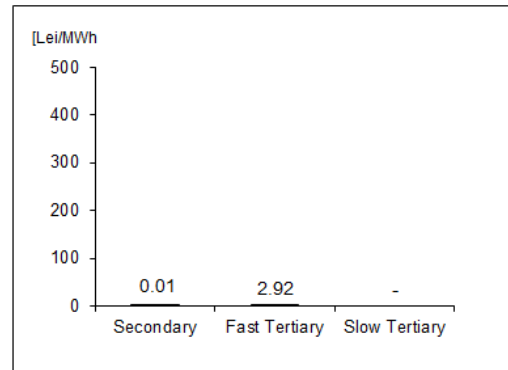
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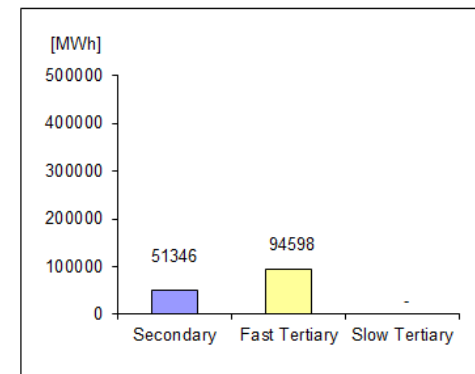
## Balancing energy – Selected prices and quantities in April 2021

April 2021

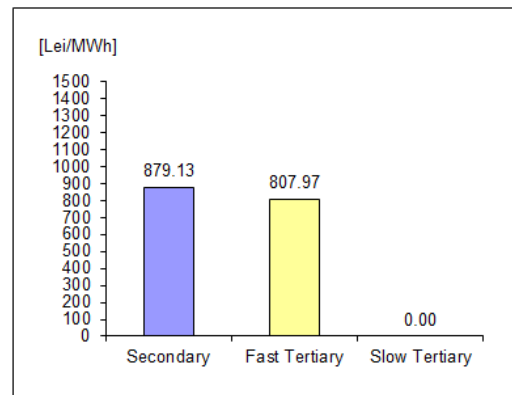
Downward regulation - average price [lei/MWh]



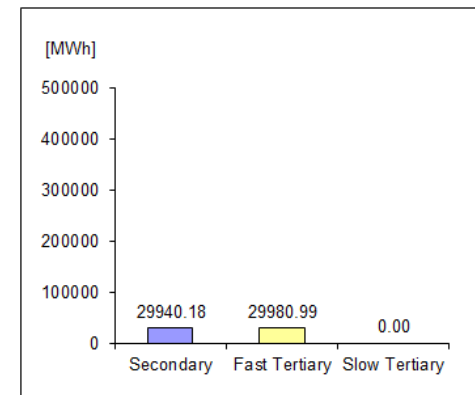
Downward regulation - selected quantities [MWh]



Upward regulation - average price [lei/MWh]



Upward regulation - selected quantities [MWh]



$$\text{Price}_{\text{average weighted, regulation type, direction}} = \frac{\sum (Q_{i,j} * P_{i,j})}{\sum Q_{i,j}}$$

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  $i$ .

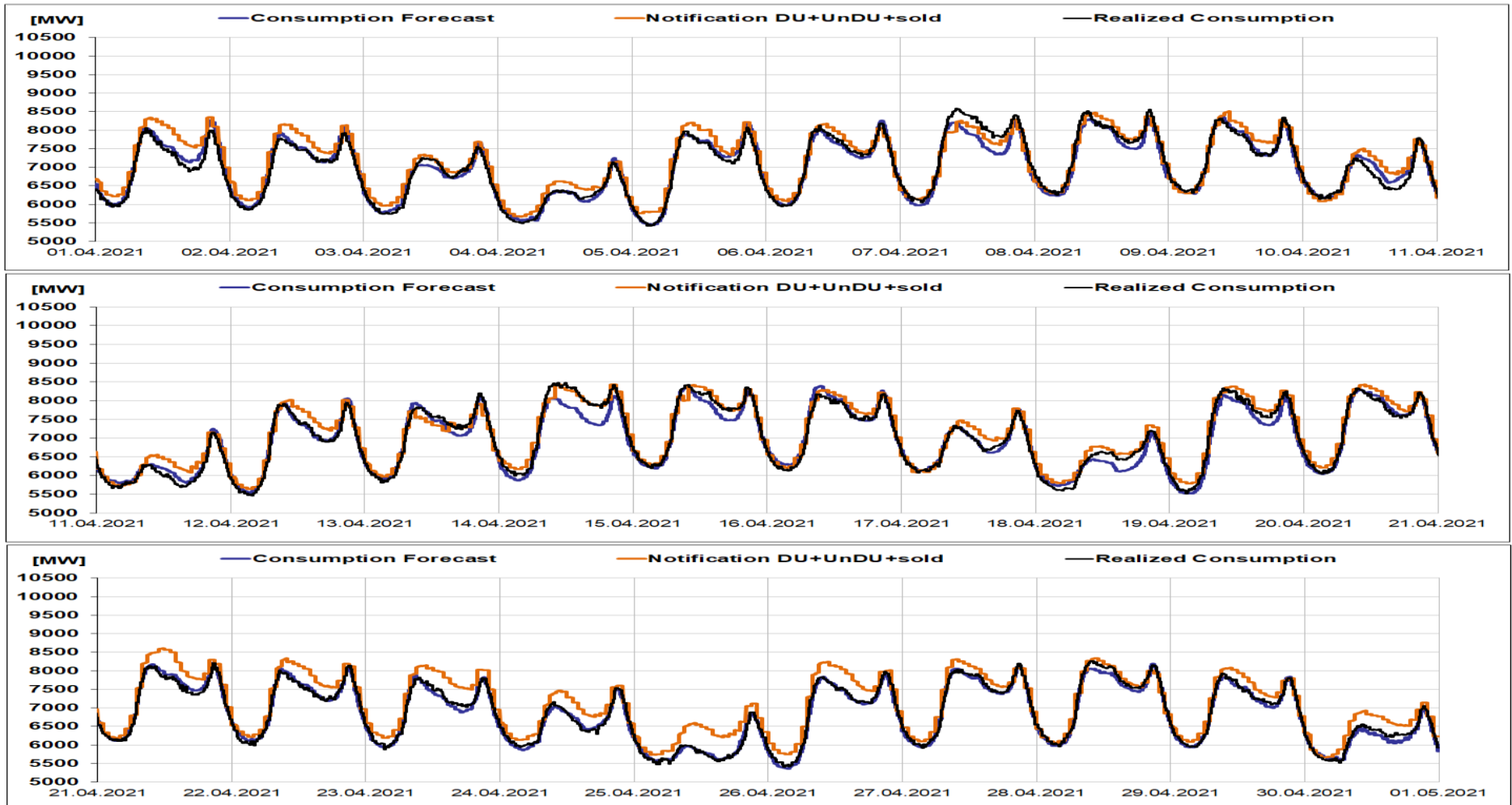


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# Balancing Market

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



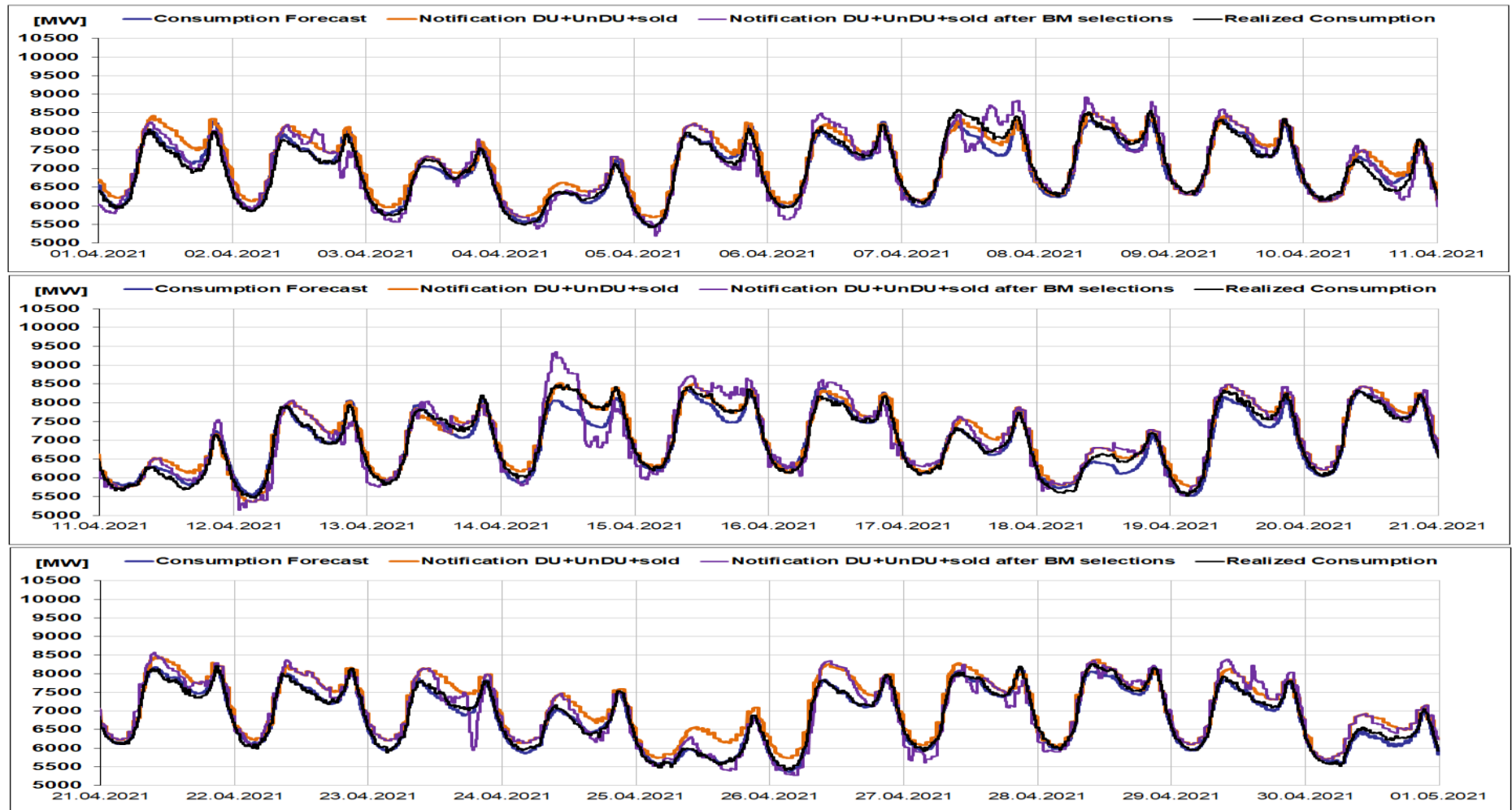


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# Balancing Market

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





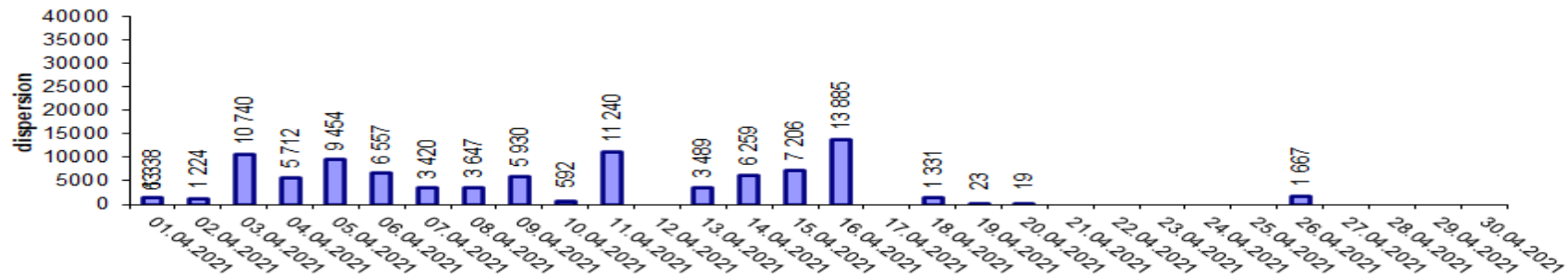
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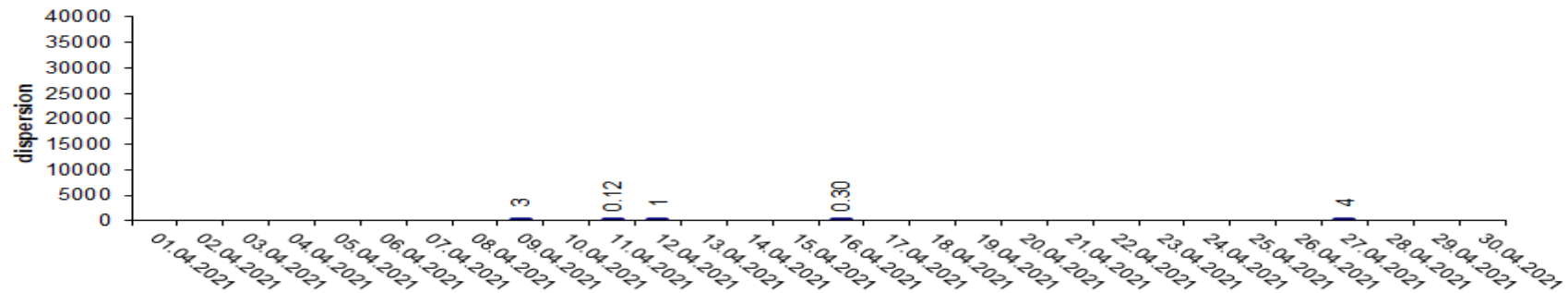
# Balancing Market

## 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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