



Transelectrica®
Societate Administrată în Sistem Dualist

MARKET MONITORING REPORT

Balancing Market

May 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 (section Transparency).



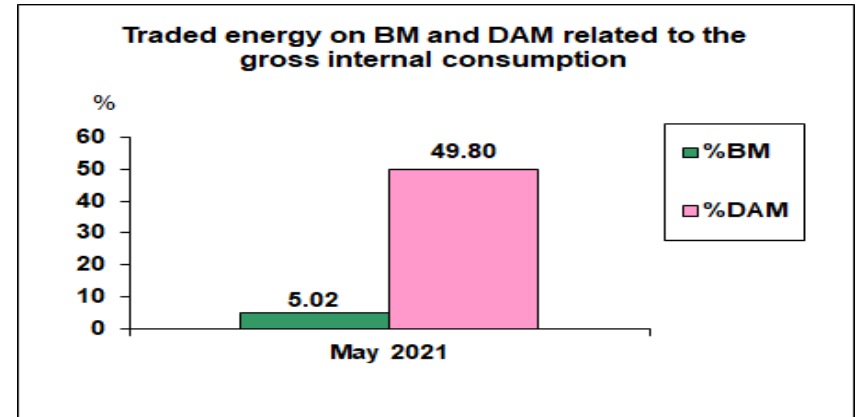
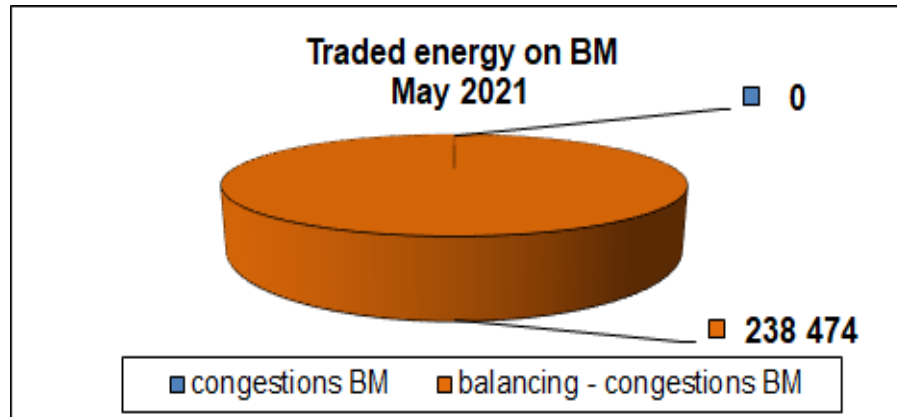
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Balancing Market

The Balance Generation/Consumption

- The average monthly value of generated power was 6 722 MW and the actual internal gross consumption was 6 386 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being **1.77%**. 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 **6.17%**. The greatest daily deviation regarding the notifications was registered on 3rd of May (**12.07%**).
- The energy used in May 2021 for balancing the power system and congestion management was 238 474 MWh (with an average power of 321 MW, which means **5.02%** 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 May 2021 on Day Ahead Market was 2 366 279 MWh (with an average power of 3 180 MW, which means **49.8%** from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 26 133 778 lei (with an average weighted price of 109.59 lei/MWh).



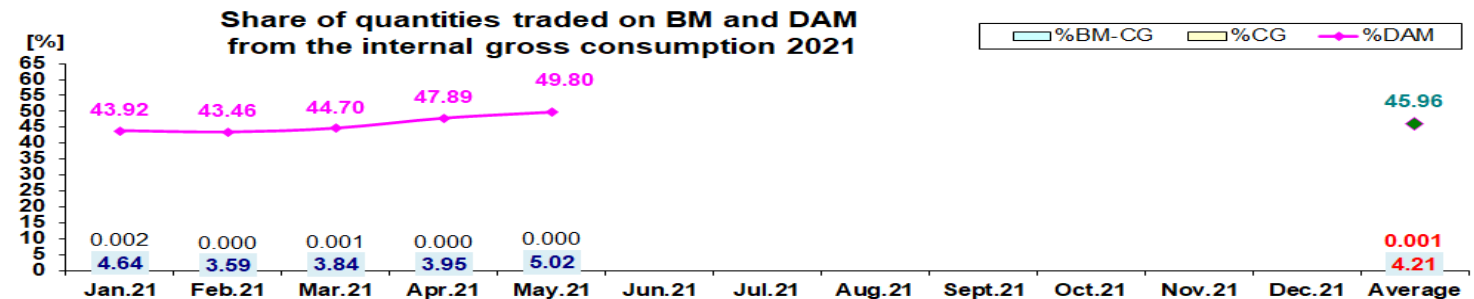
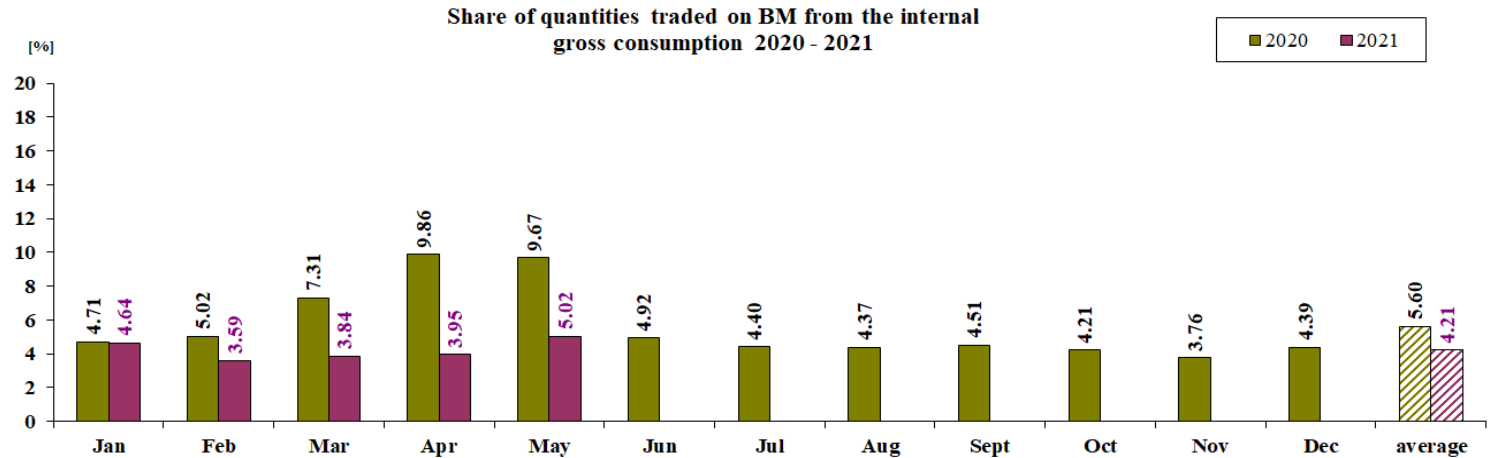


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Balancing Market

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).



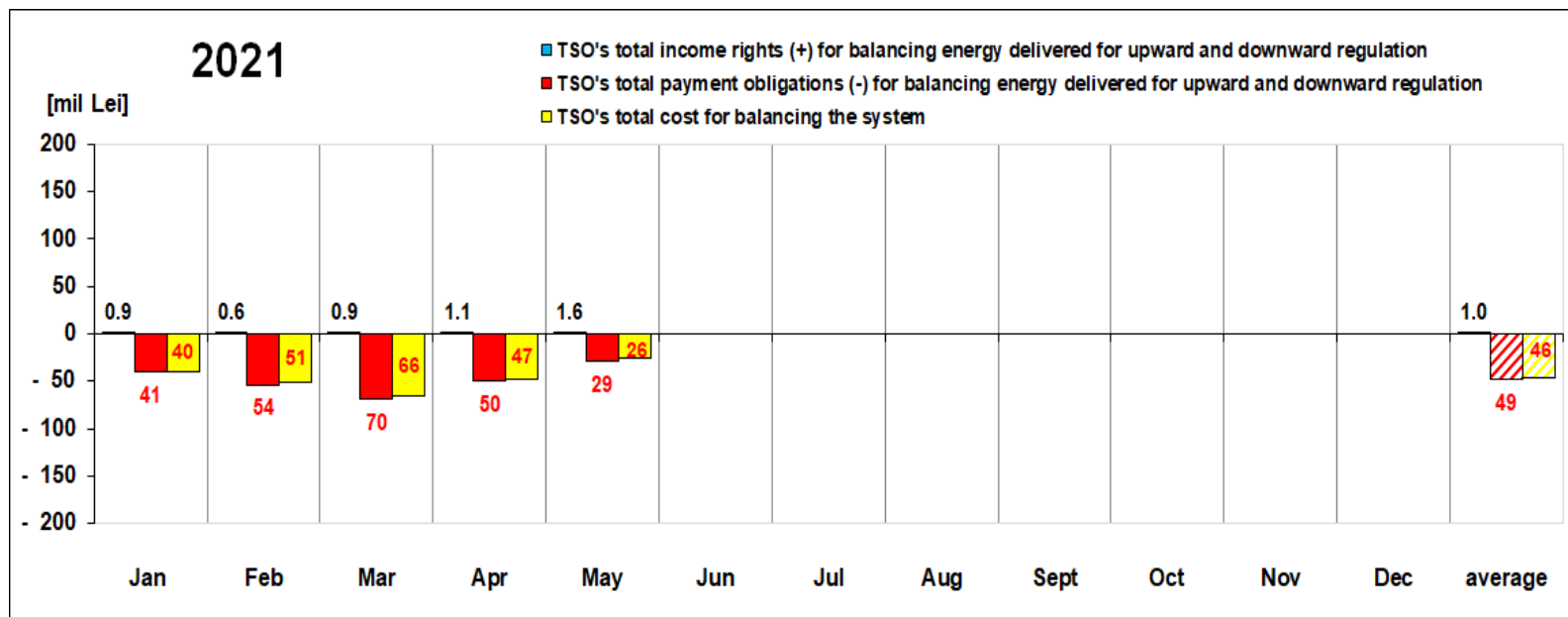
	2021												
	Jan.21	Feb.21	Mar.21	Apr.21	May.21	Jun.21	Jul.21	Aug.21	Sept.21	Oct.21	Nov.21	Dec.21	Average
%BM	4.64	3.59	3.84	3.95	5.02								4.21
%DAM	43.92	43.46	44.70	47.89	49.80								45.96
%CG	0.002	0.000	0.001	0.000	0.000								0.001
%BM-CG	4.636	3.592	3.836	3.947	5.019								4.21
% outside BM	0.02	0.00	0.00	0.00	0.00								0.003



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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	1 558 592								1 022 162	5 110 812
	payments (-) prices < 0	- 367 742	- 8 158	- 280 354	- 849 859	0								- 301 222	- 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	-29 085 259								-48 416 509	- 242 082 545
	incomes (+) prices < 0	0	0	0	0	0								0	0
TSO's total income rights (+) for balancing		878 222	633 581	912 692	1 127 724	1 558 592								1 022 162	5 110 812
TSO's total payment obligations (-) for		-40 502 162	-54 053 301	-69 550 500	-50 397 436	-29 085 259								-48 717 732	- 243 588 658
TSO's total cost for balancing the system		-39 649 686	-50 861 284	-65 692 590	-47 412 381	-26 133 778								-45 949 944	- 229 749 719
Value of transactions outside BM (with financial compensation)		- 25 803	0	0	0	0								- 5 161	- 25 803
Congestion Cost on BM		- 56	0	- 121	0	0								- 35	- 177
Congestion Cost outside BM		0	0	0	0	0								0	0

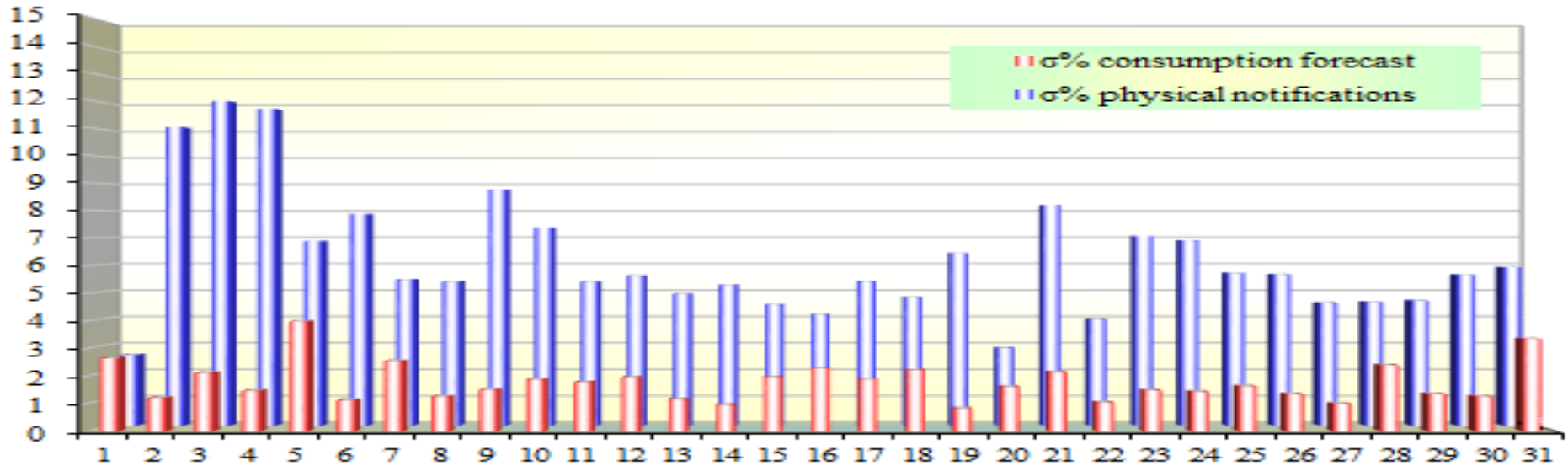


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Balancing Market

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



May 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	31
$\sigma\%$ consumption forecast	2.65	1.21	2.12	1.47	3.98	1.13	2.55	1.26	1.51	1.88	1.78	1.95	1.17	0.95	1.97	2.28	1.89	2.21	0.82	1.61	2.14	1.04	1.48	1.43	1.63	1.34	1.00	2.40	1.35	1.26	3.35
$\sigma\%$ physical notifications	2.63	11.10	12.07	11.77	6.87	7.87	5.44	5.36	8.79	7.36	5.35	5.58	4.90	5.23	4.50	4.13	5.37	4.77	6.42	2.88	8.21	3.97	7.06	6.90	5.68	5.63	4.57	4.61	4.66	5.62	5.89

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

R = Realized Consumption;

N = Physical Notifications;

P = Consumption Forecast.

$\sigma_{\text{average\% consumption forecast}} = 1.77$

$\sigma_{\text{average\% physical notifications}} = 6.17$

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

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.

May 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	0.10	0.10	0.10	64146.94	64146.94	0.00%	3	61.8%	100%	61.8%	100%	4596	4596
Fast Tertiary	11.30	54.00	0.10	144691.08	139825.51	3.36%	7	45.36%	98.98%	44.98%	98.98%	3623	3616
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-	-
				208838.03	203972.46	2.33%							

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	910.55	1185.31	499.00	21705.26	21705.26	0.00%	3	61.81%	100%	61.81%	100%	4593	4593
Fast Tertiary	728.34	933.31	450.00	13540.02	12796.23	5.49%	6	62.98%	91.22%	63.26%	91.37%	4412	4446
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-	-
				35245.28	34501.49	2.11%							



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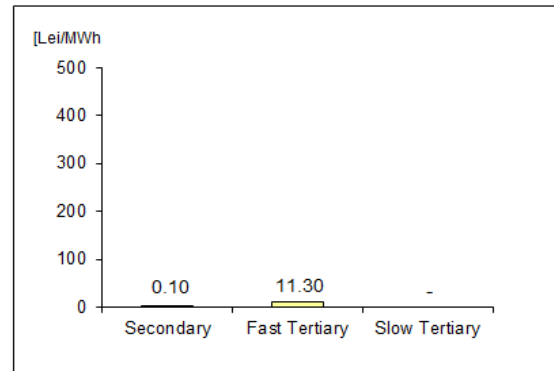
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Balancing Market

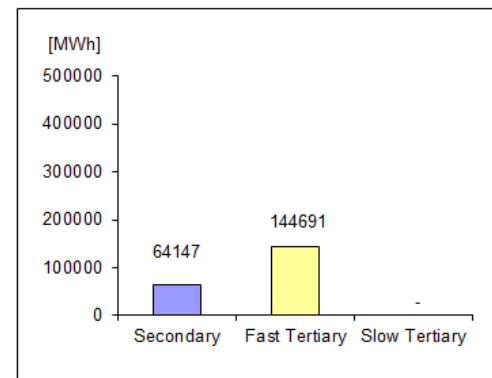
Balancing energy – Selected prices and quantities in May 2021

May 2021

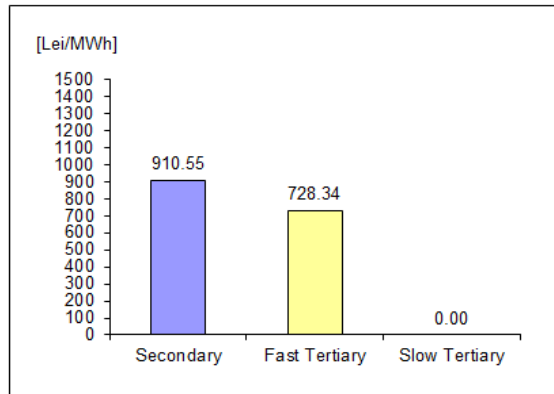
Downward regulation - average price [lei/MWh]



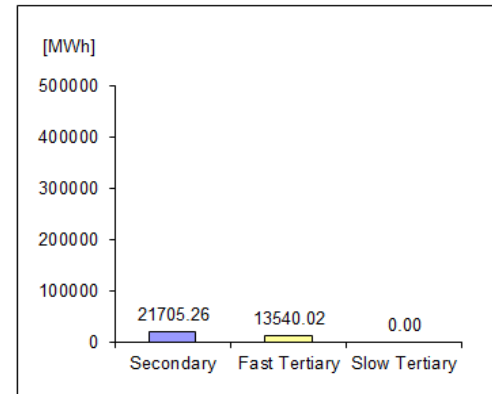
Downward regulation - selected quantities [MWh]



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 .

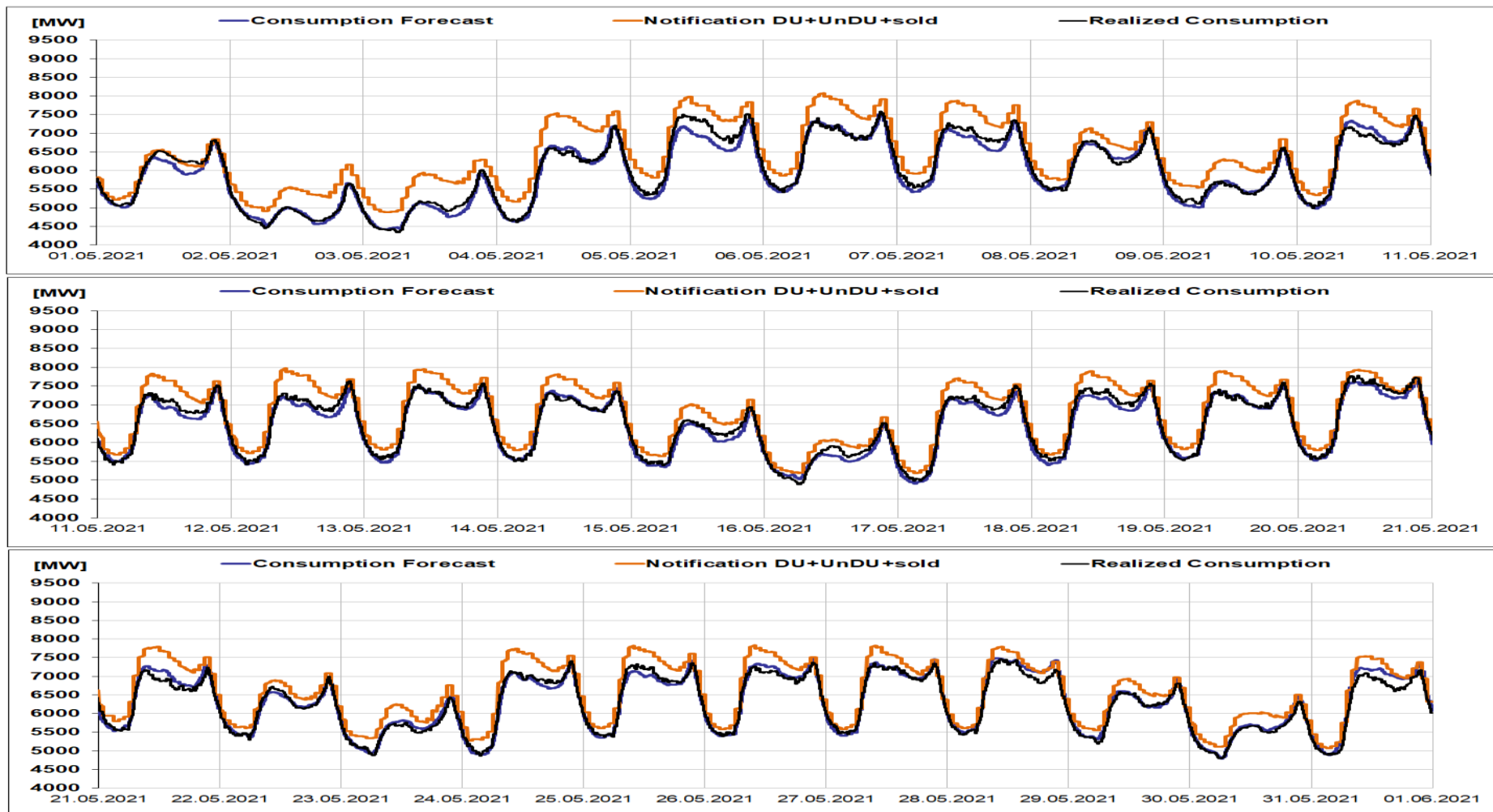


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Realized consumption, forecast, notifications in D-1



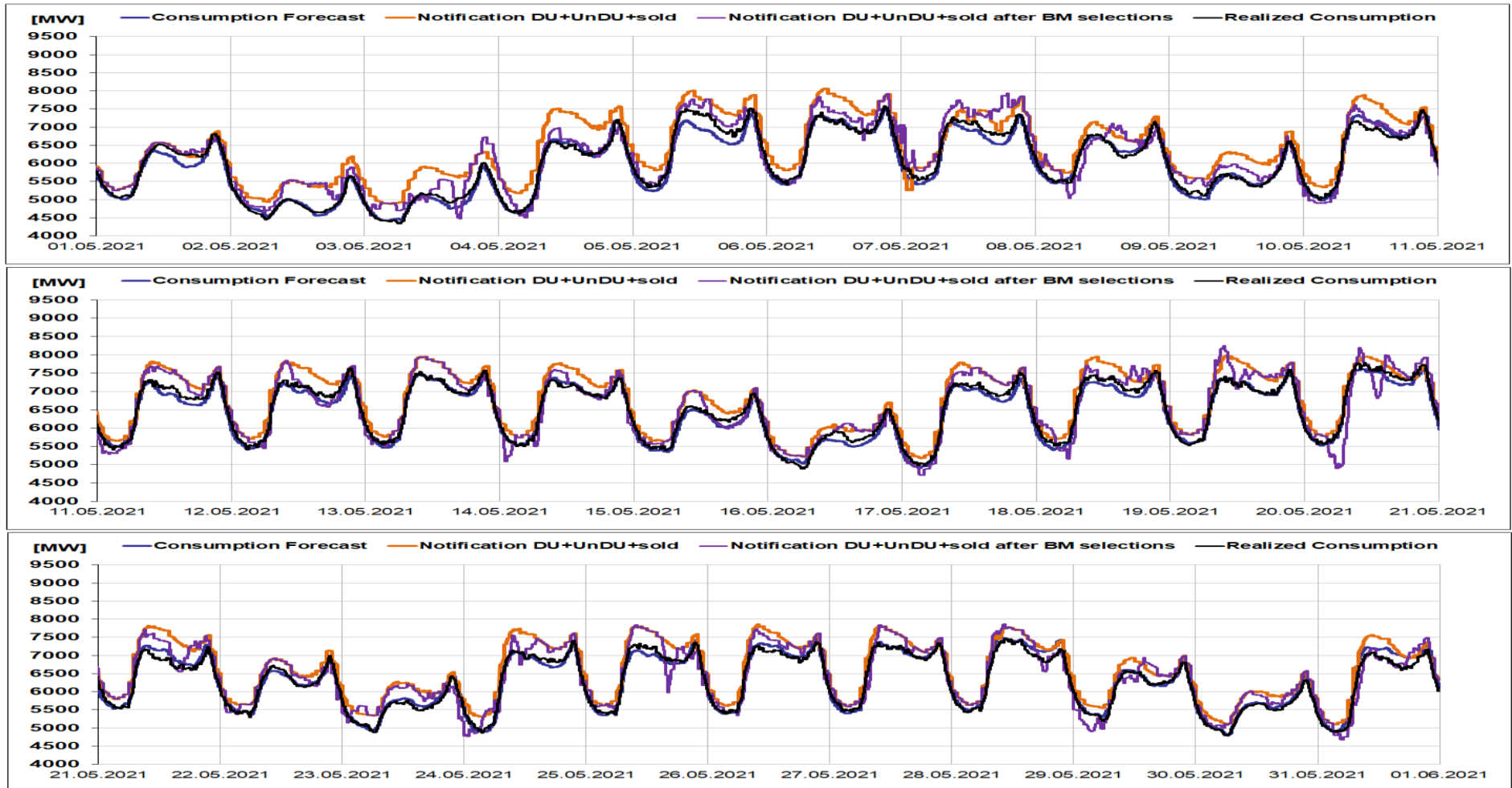


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Balancing Market

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



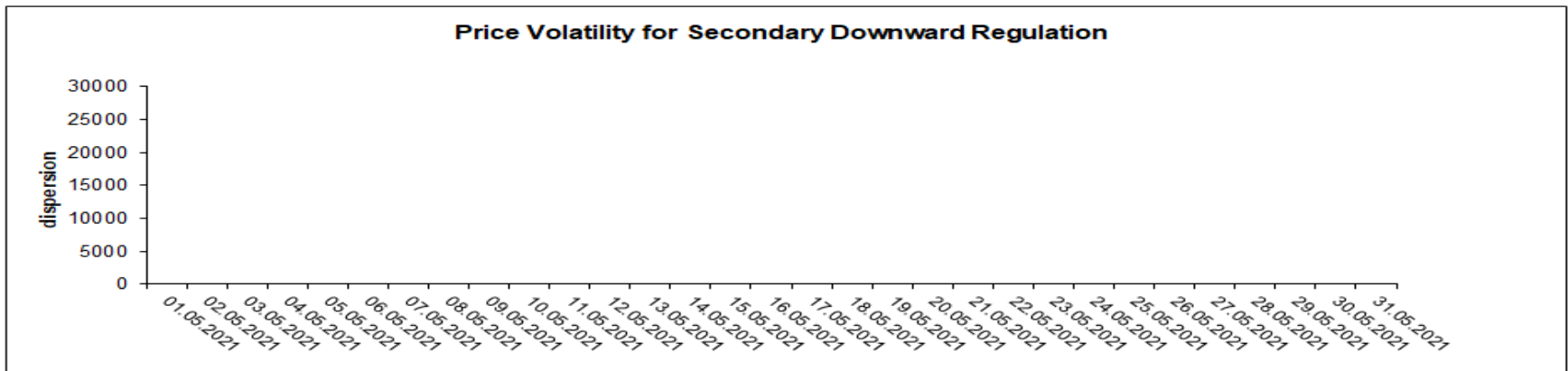
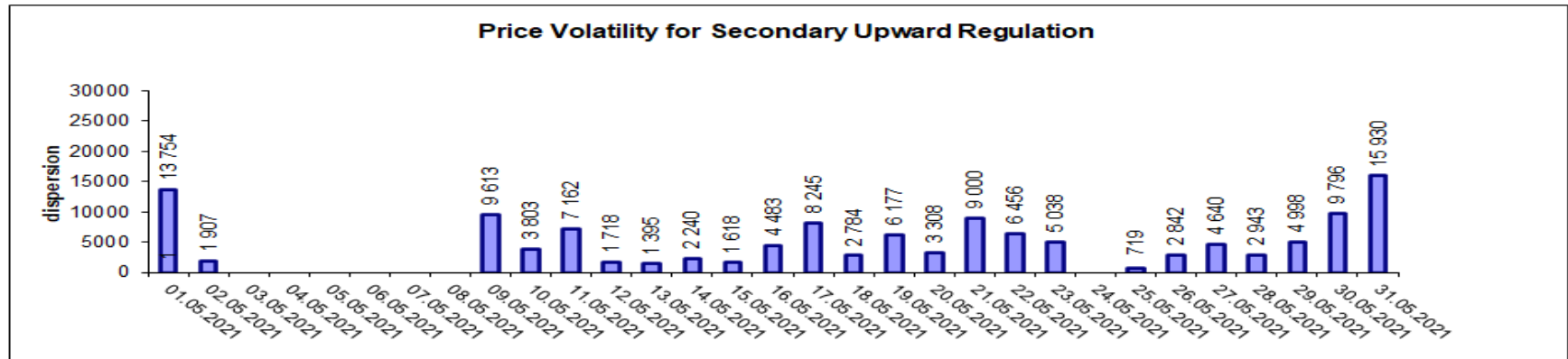


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Balancing Market

Indicators – Price Volatility for Secondary Regulation



Volatility = price dispersion on studied interval:

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



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