



Transelectrica®
Societate Administrată în Sistem Dualist

MARKET MONITORING REPORT

Balancing Market

May 2020

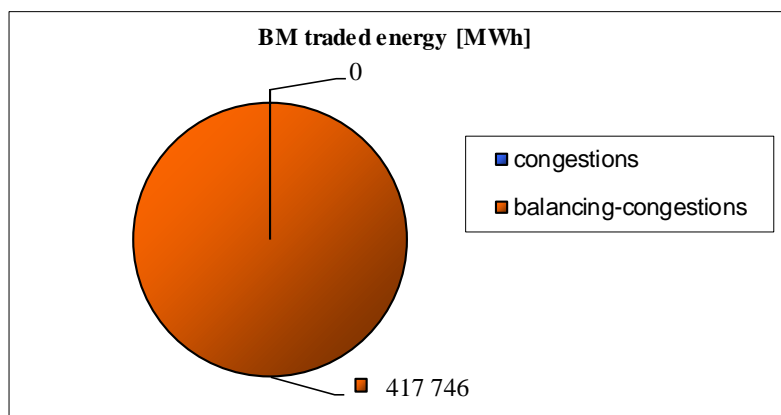
ANRE - Romanian Energy Regulatory Authority
HHI - Herfindahl-Hirschman Index
BRP - Balance Responsible Party
BM - Balancing Market
DAM - Day Ahead Market
TSO - Transmission System Operator
DU – Dispatchable Unit
PN – Physical Notification
NDC - National Dispatching Center
C1 – The market share of the 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.

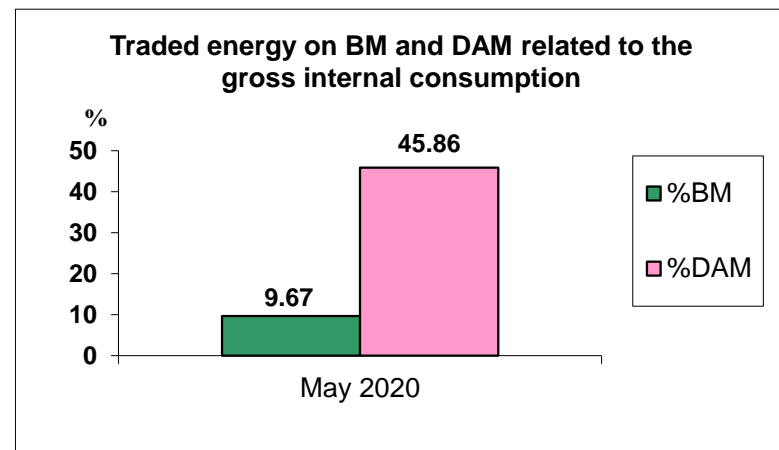
Using the records from the markets data bases, Transelectrica prepares daily, weekly and monthly monitoring reports. A part of the data included in these reports (those data which are not confidential) are published on the website www.transelectrica.ro (section Transparency).

The Balance Generation/Consumption

- The average monthly value of generated power was 5 364 MW and the actual internal gross consumption was 5 807 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being **1,68%**. 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 **6,93%**. The greatest daily deviation regarding the notifications was registered in **02.05 (8.81%)**.
- The energy used in May 2020 for balancing the power system and congestion management was 417 746 MWh (with an average power of 561 MW, which means **9.67%** from the internal gross consumption). No transactions were made for congestion management.
- The energy traded in May 2020 on Day Ahead Market was 19 813 28 MWh (with an average power of 2 663 MW, which means **45.86%** from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 11 880 365 lei (with an average weighted price of 28.44 lei/MWh), from which:
 - the cost of the energy paid by C.N.T.E.E. Transelectrica S.A. for balancing was de 11 880 365 lei (from which startup cost 0 lei);
 - the cost of the energy paid by C.N.T.E.E. Transelectrica S.A. for congestion management was 0 lei.



May 2020

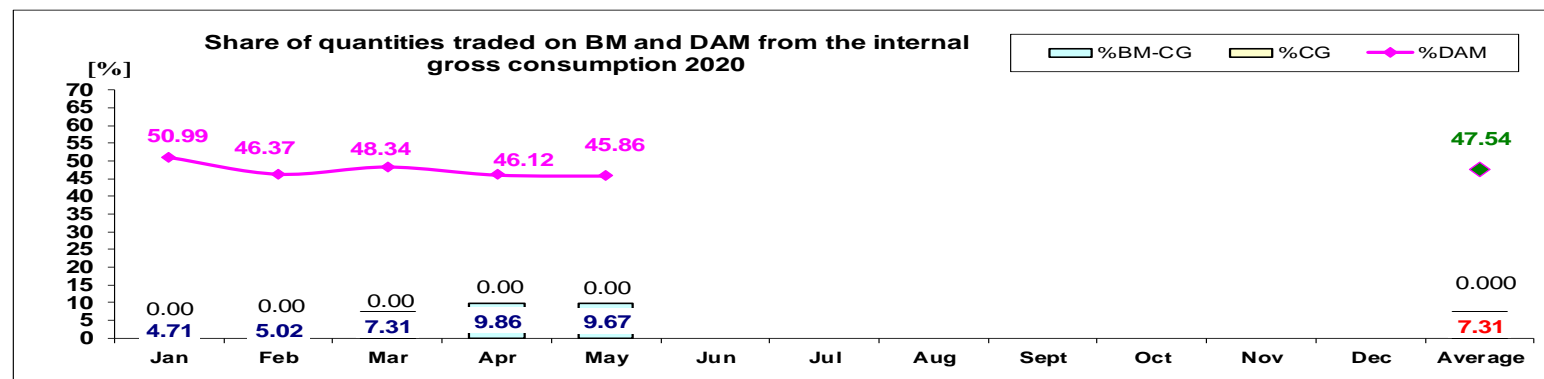
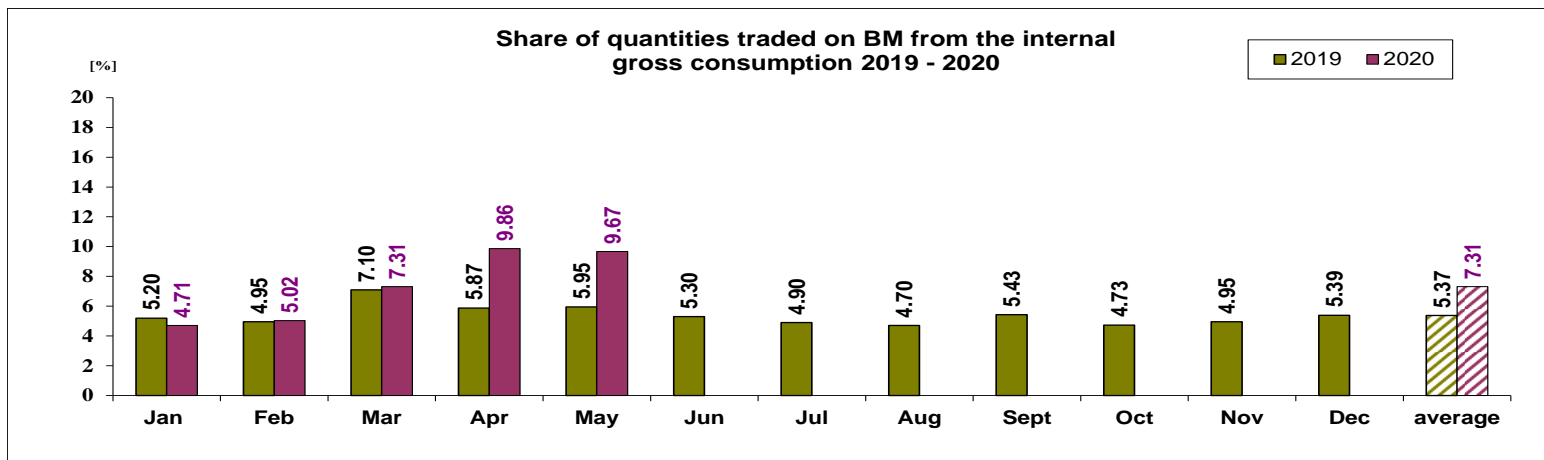


Public

Balancing Market

The Balance Generation / Consumption

- Monthly percentage values resulted are calculated as ratio between traded volumes on BM 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).



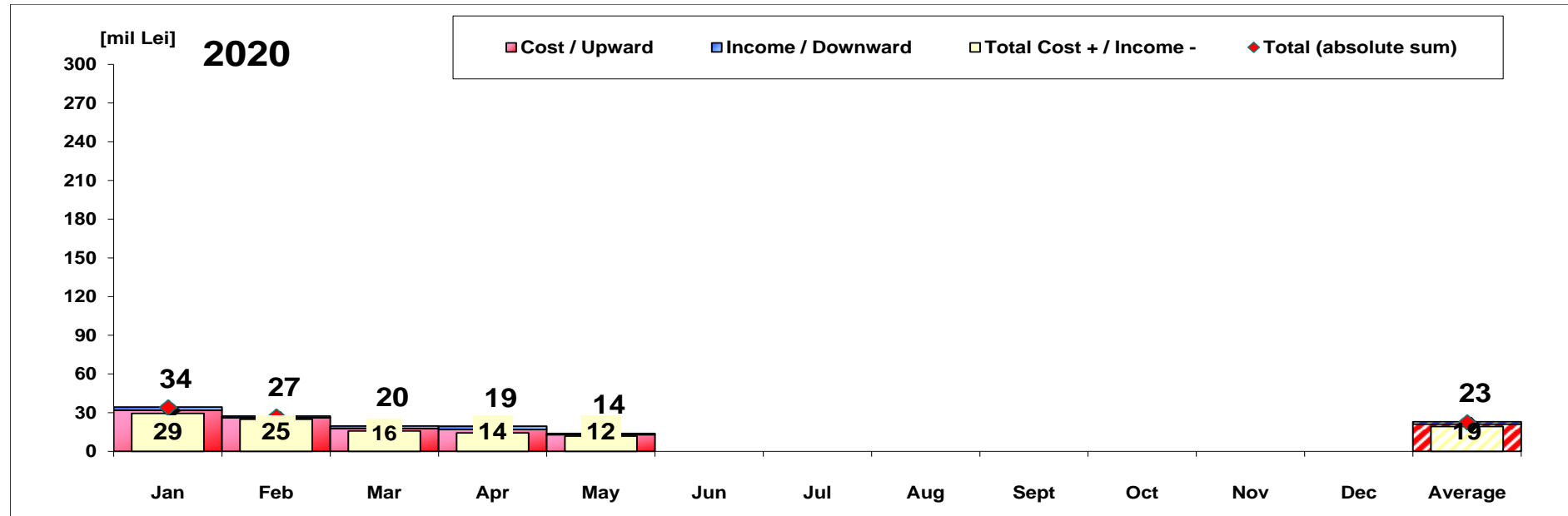
	2020												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Average
%BM	4.71	5.02	7.31	9.86	9.67								7.31
%DAM	50.99	46.37	48.34	46.12	45.86								47.54
%CG	0.00	0.00	0.00	0.00	0.00								0.000
%BM-CG	4.71	5.02	7.31	9.86	9.67								7.31



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Balancing Energy Market Transactions



[Lei]	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Average	Total
Cost / Upward	31 888 098	26 145 180	17 762 040	16 885 892	12 922 176								21 120 677	105 603 385
Income / Downward	2 431 458	1 215 818	1 941 606	2 607 194	1 041 810								1 847 577	9 237 886
CE Cost	0	0	0	0	0								0	0
Total Cost + / Income -	29 456 640	24 929 362	15 820 434	14 278 698	11 880 365								19 273 100	96 365 499
Total (absolute sum)	34 319 556	27 360 998	19 703 646	19 493 085	13 963 986								22 968 254	114 841 272

CE – Congestion Energy

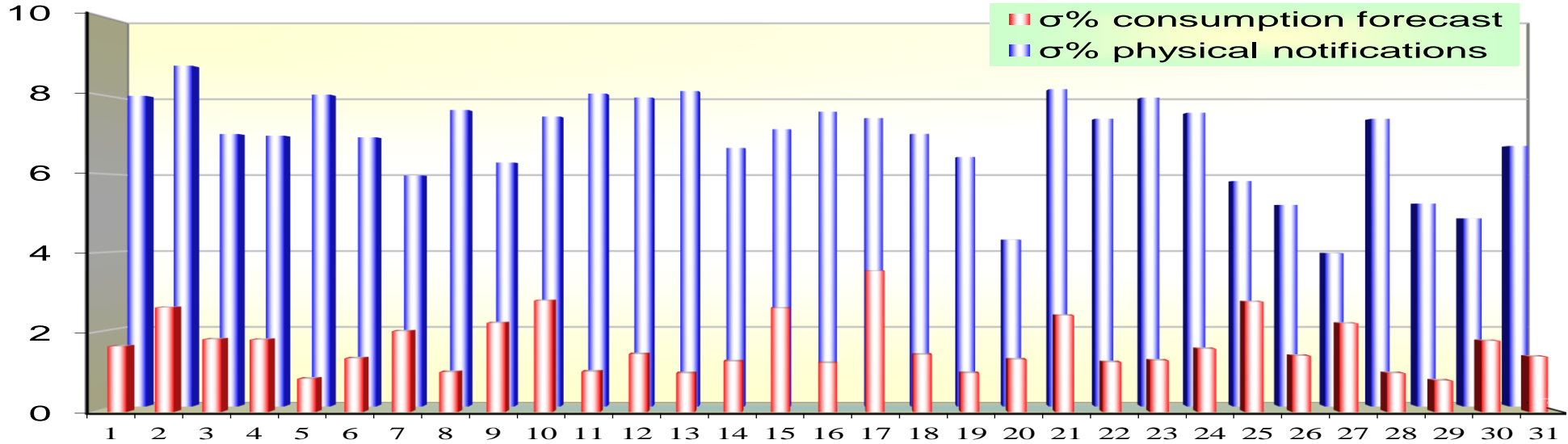
* The average annual value of BM transactions (the absolute sum of upward and downward transactions) was calculated as average of monthly values.



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Standard deviation of physical notifications and consumption forecast against the actual consumption in May 2020



May 2020

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	1.65	2.63	1.83	1.82	0.83	1.35	2.03	1.00	2.24	2.80	1.01	1.46	0.97	1.27	2.61	1.23	3.55	1.44	0.98	1.32	2.43	1.25	1.29	1.59	2.77	1.41	2.23	0.97	0.79	1.79	1.39
σ% physical notifications	8.03	8.81	7.04	7.00	8.06	6.96	5.97	7.66	6.31	7.49	8.09	7.99	8.15	6.68	7.17	7.62	7.45	7.05	6.45	4.31	8.20	7.44	7.98	7.59	5.83	5.21	3.96	7.44	5.25	4.86	6.74

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

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

σ_{average% consumption forecast} = 1.68

σ_{average % physical notifications} = 6.93

R = Realized Consumption;

N = Physical Notifications;

P = Consumption Forecast.

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Balancing Market

Balancing energy – Selected prices and quantities

- At the beginning of the month on the Balancing Market operated 67 BRPs, 109 market participants, holding 205 commercially operating dispatchable units.

May 2020

Downward regulation

Downward regulation	Prices [lei/MWh]			Quantities [MWh]			Participants						
	Monthly	Maximum	Minimum	Total	Actually	Deviation	C1	C3	C1	C3	HHI	HHI	
	average			selected	delivered	%	Number	(selected)	(actually delivered)	(selected)	(actually delivered)	(actually delivered)	
Secondary	0.10	0.10	0.10	62010.92	62010.92	0.00%	3	66.97%	100.00%	66.97%	100.00%	5052	5052
Fast Tertiary	2.29	702.56	0.10	336410.83	328497.28	2.35%	8	63.43%	96.31%	63.93%	96.45%	4571	4624
Slow Tertiary	80.02	192.67	30.00	4235.00	4233.30	0.04%	2	50.65%	100.00%	50.67%	100.00%	5001	5001
				402656.75	394741.50	1.97%							

Upward regulation

	Monthly	Maximum	Minimum	Total	Actually	Deviation	C1	C3	C1	C3	HHI	HHI	
	average			selected	delivered	%	Number	(selected)	(actually delivered)	(selected)	(actually delivered)	(actually delivered)	
Secondary	580.02	769.00	450.10	21105.18	21105.18	0.00%	3	66.03%	100.00%	66.03%	100.00%	4957	4957
Fast Tertiary	360.95	676.00	0.10	2080.78	1899.70	8.70%	7	58.94%	94.37%	60.85%	95.87%	4220	4416
Slow Tertiary	-	-	-	-	-	-	-	-	-	-	-	-	-
				23185.96	23004.88	0.78%							



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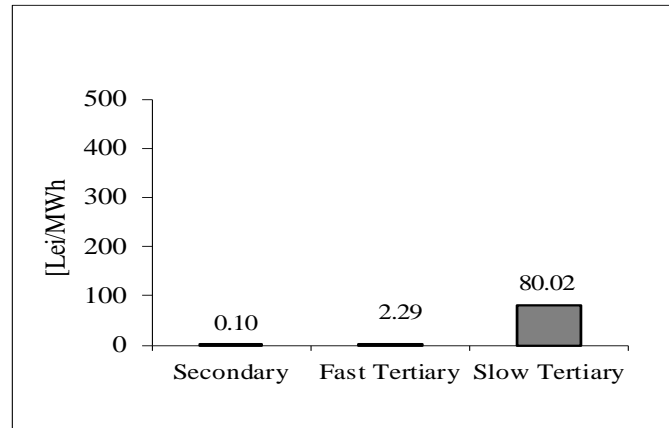
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Balancing Market

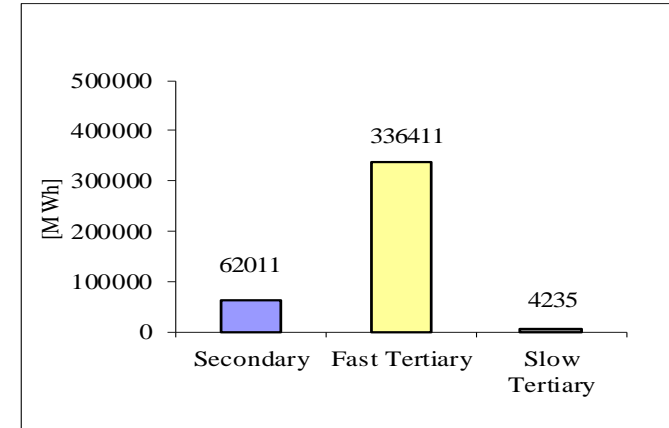
Balancing energy – Selected prices and quantities in May 2020

May 2020

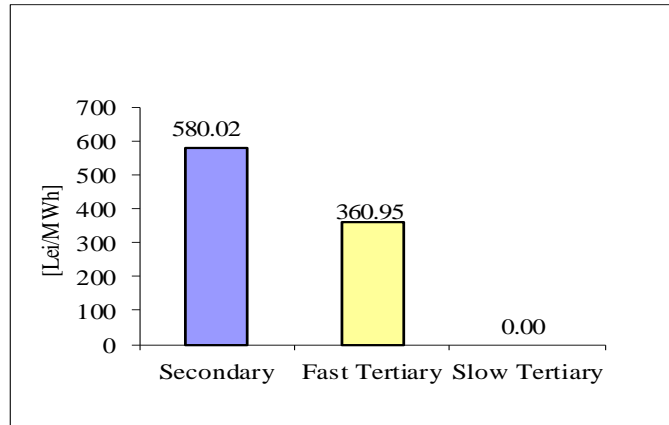
Downward regulation - average price [lei/MWh]



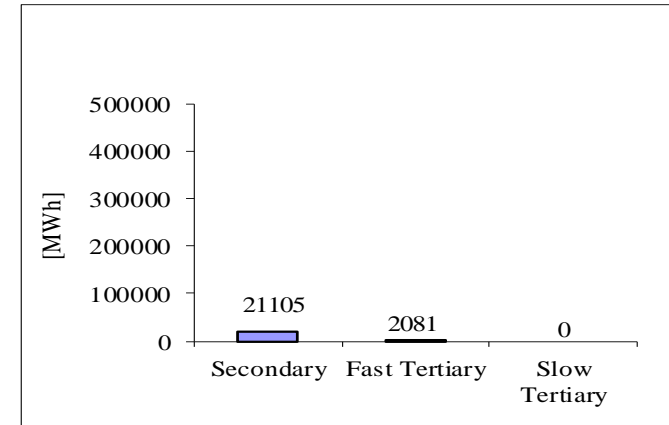
Downward regulation - selected quantities [MWh]



Upward regulation - average price [lei/MWh]



Upward regulation - selected quantities [MWh]



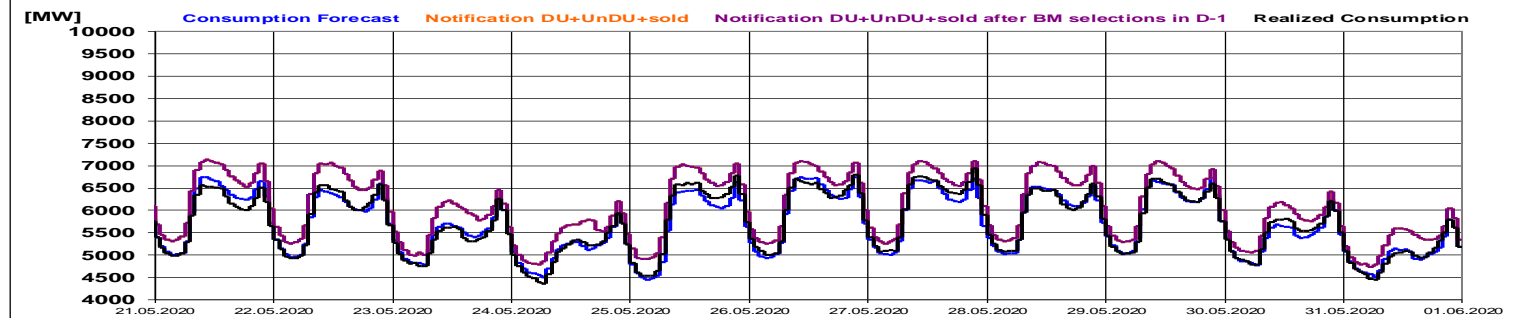
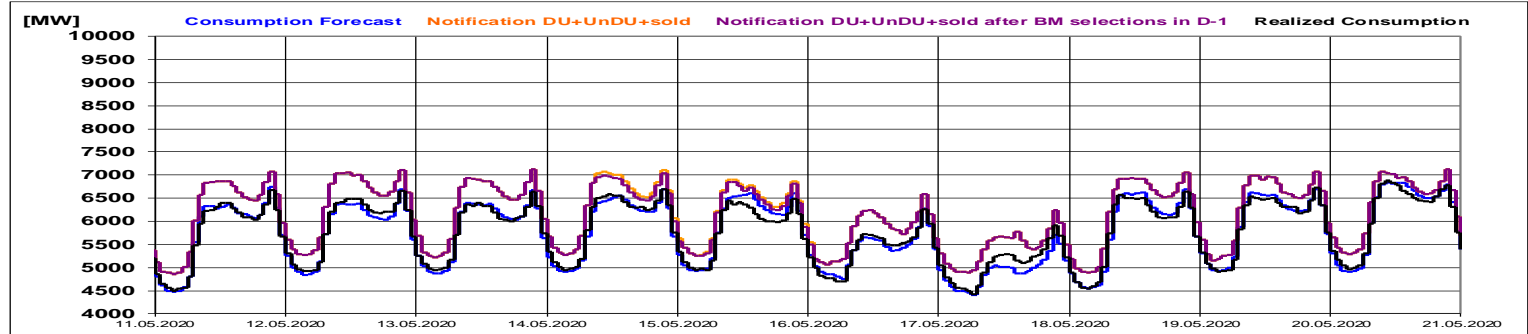
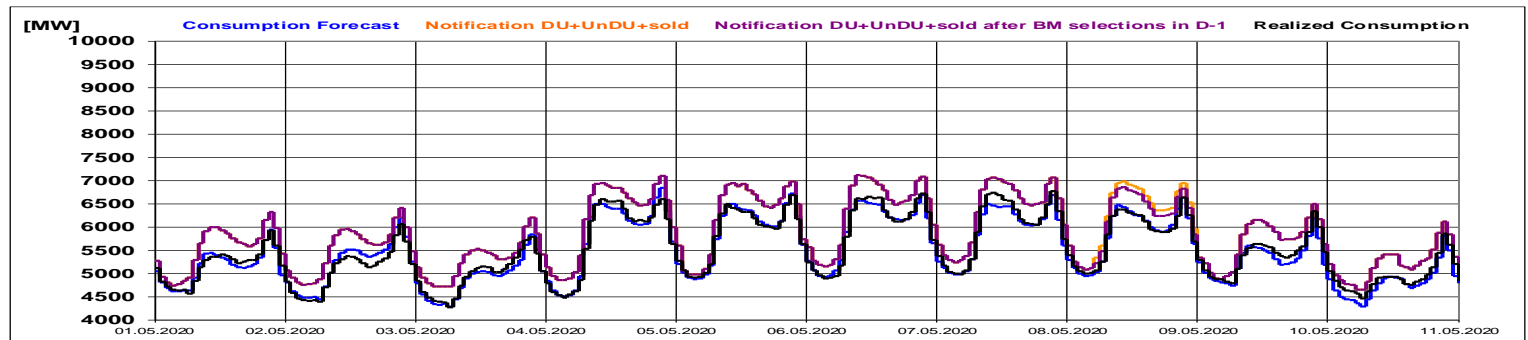


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Balancing Market

Realized consumption, forecast, notifications,
notifications after BM selections in D-1



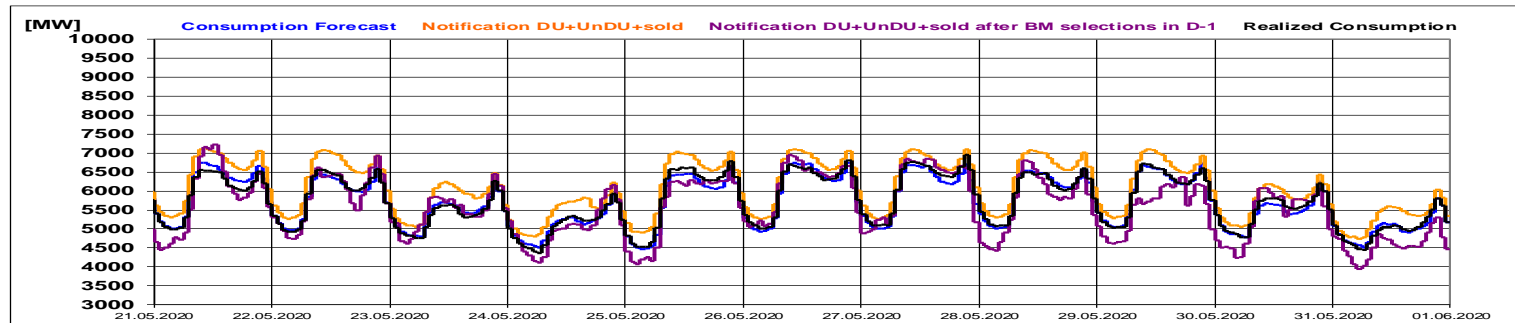
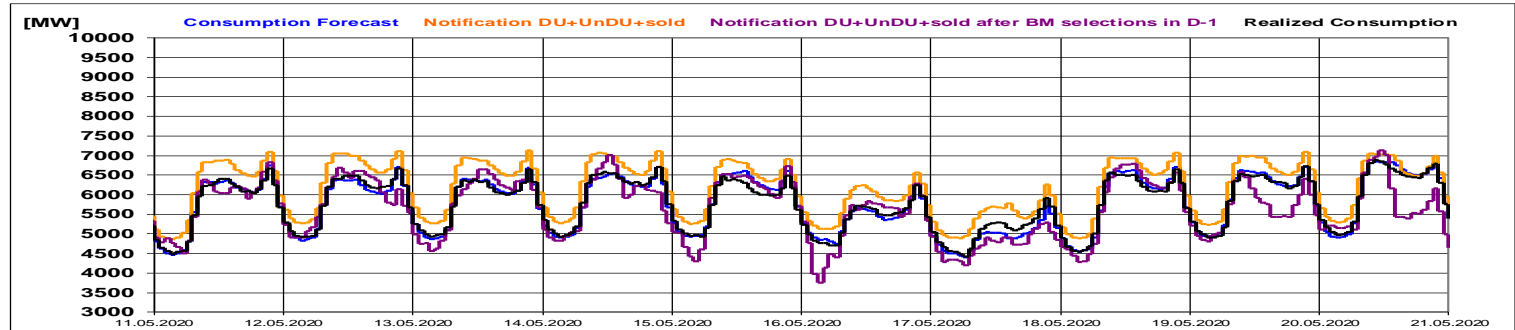
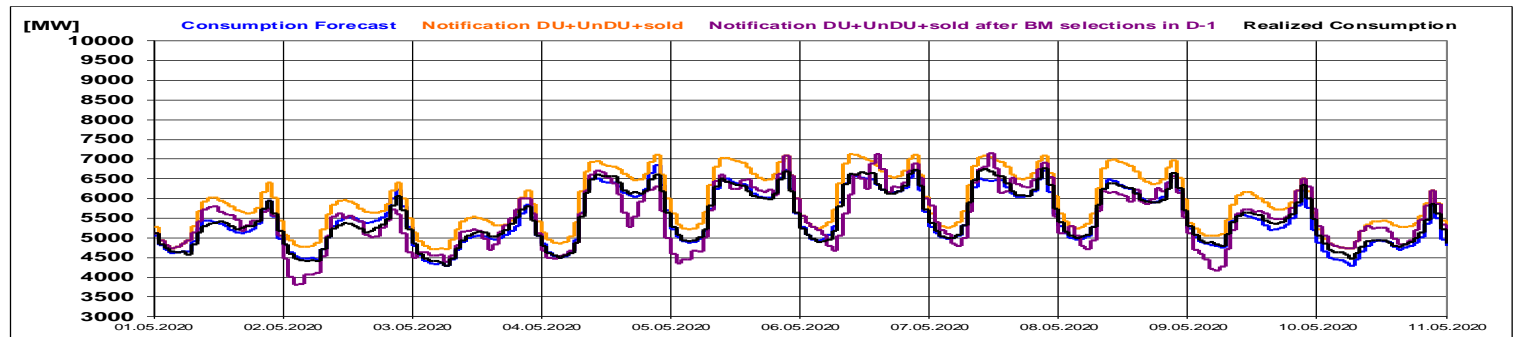


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Balancing Market

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



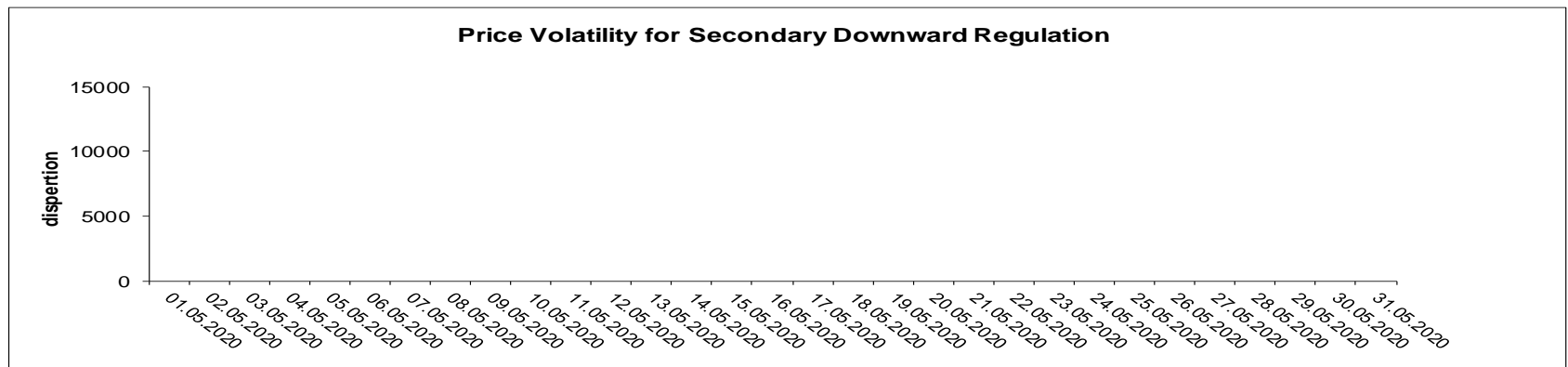
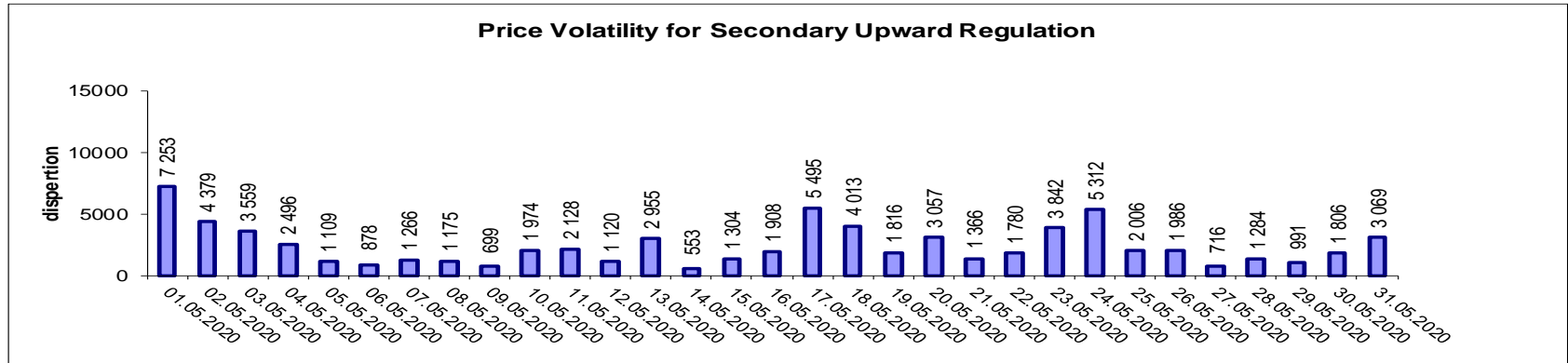


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Balancing Market

Indicators – Price Volatility for Secondary Regulation



Price volatility for Secondary Downward Regulation, determined as the daily price dispersion, recorded zero values throughout the month, because of constant price values from one hour to the next.

Volatility = price dispersion on studied interval:

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



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