



Transelectrica®
Societate Administrată în Sistem Dualist

MARKET MONITORING REPORT

Balancing Market

June 2020

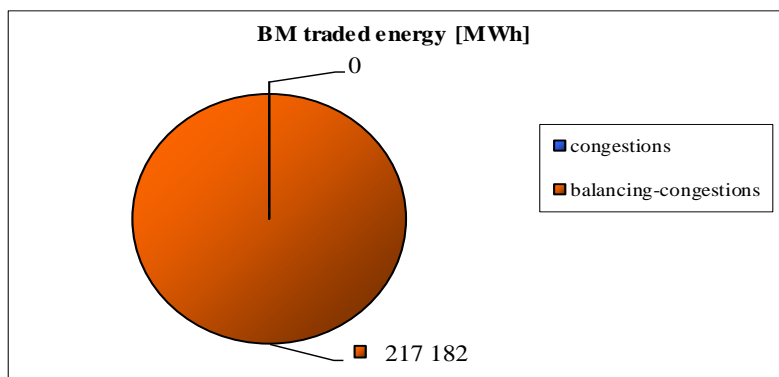
ANRE - Romanian Energy Regulatory Authority
HHI - Herfindahl-Hirschman Index
BRP - Balance Responsible Party
BM - Balancing Market
DAM - Day Ahead Market
TSO - Transmission System Operator
DU – Dispatchable Unit
PN – Physical Notification
NDC - National Dispatching Center
C1 – The market share of the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

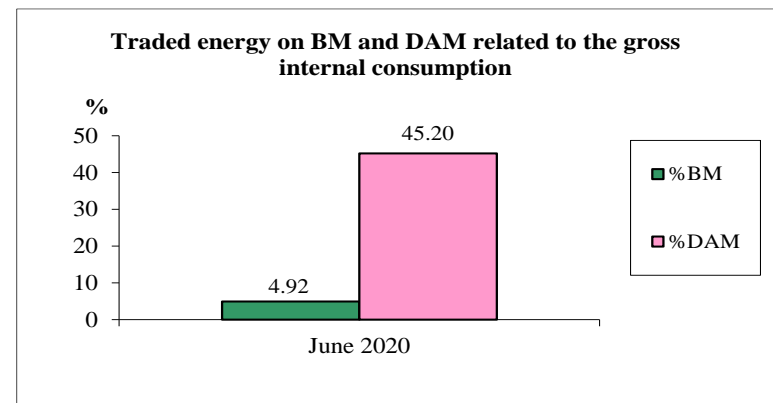
Using the records from the markets data bases. Transelectrica prepares daily. weekly and monthly monitoring reports. A part of the data included in these reports (those data which are not confidential) are published on the website www.transelectrica.ro (section Transparency).

The Balance Generation/Consumption

- The average monthly value of generated power was 5 846 MW and the actual internal gross consumption was 6 128 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being **2.86%**. 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 **4.02%**. The greatest daily deviation regarding the notifications was registered in **08.06 (9.91%)**.
- The energy used in June 2020 for balancing the power system and congestion management was 217 182 MWh (with an average power of 302 MW, which means **4.92%** from the internal gross consumption). No transactions were made for congestion management.
- The energy traded in June 2020 on Day Ahead Market was 1 994 370 MWh (with an average power of 2 770 MW, which means **45.20%** from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 23 054 838 lei (with an average weighted price of 106.15 lei/MWh), from which:
 - the cost of the energy paid by C.N.T.E.E. Transelectrica S.A. for balancing was de 23 054 838 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.



June 2020



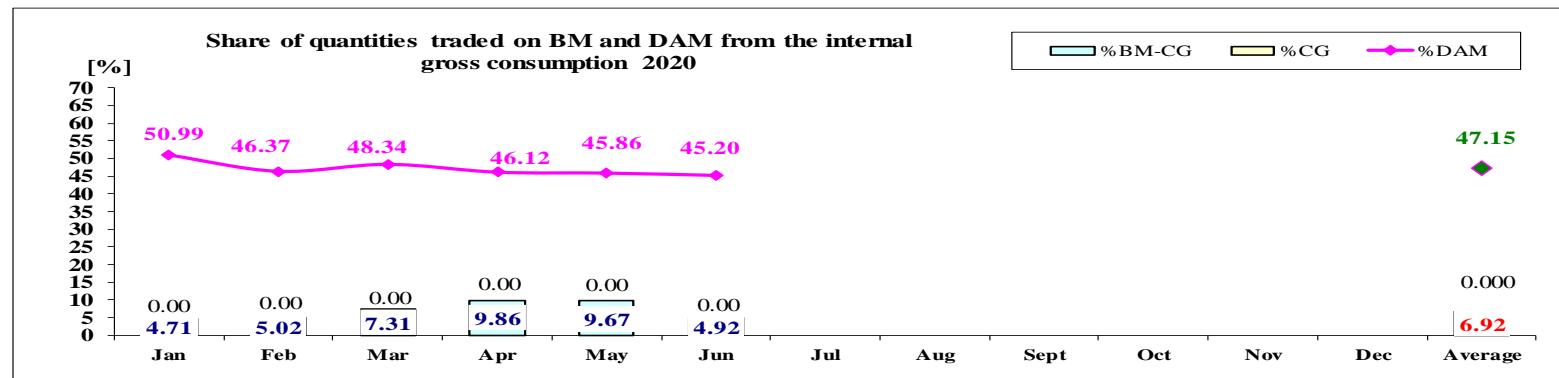
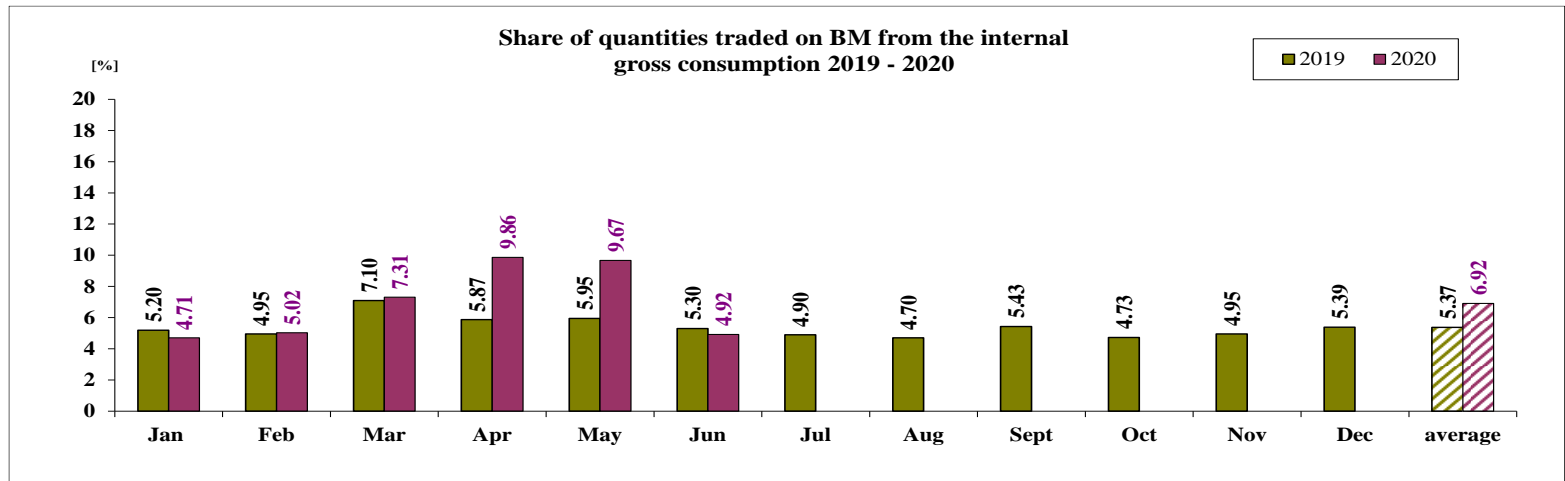


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Balancing Market

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).



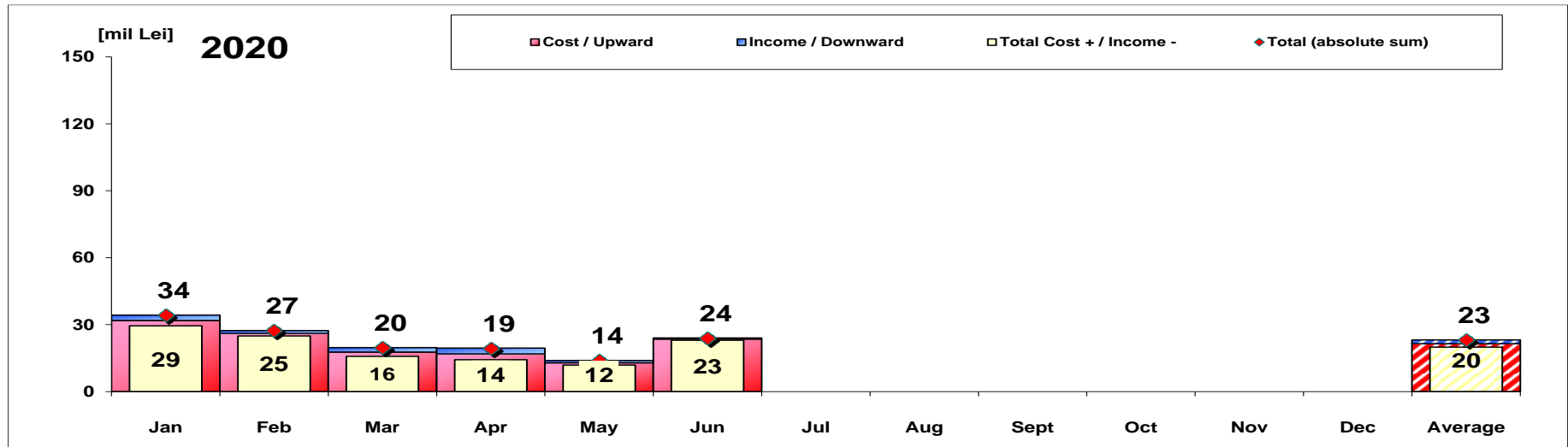
	2020												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Average
%BM	4.71	5.02	7.31	9.86	9.67	4.92							6.92
%DAM	50.99	46.37	48.34	46.12	45.86	45.20							47.15
%CG	0.00	0.00	0.00	0.00	0.00	0.00							0.000
%BM-CG	4.71	5.02	7.31	9.86	9.67	4.92							6.92



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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	23 543 913							21 524 550	129 147 298
Income / Downward	2 431 458	1 215 818	1 941 606	2 607 194	1 041 810	489 075							1 621 160	9 726 961
CE Cost	0	0	0	0	0	0							0	0
Cost for energy traded on the Balancing Market (includes startup cost)	29 456 640	24 929 362	15 820 434	14 278 698	11 880 365	23 054 838							19 903 390	119 420 337
Cost+/Income- (BE and CE)	29 456 640	24 929 362	15 820 434	14 278 698	11 880 365	23 054 838							19 903 390	119 420 337
Total (absolute sum) (BE and CE)	34 319 556	27 360 998	19 703 646	19 493 085	13 963 986	24 032 988							23 145 710	138 874 260

CE – Congestion Energy

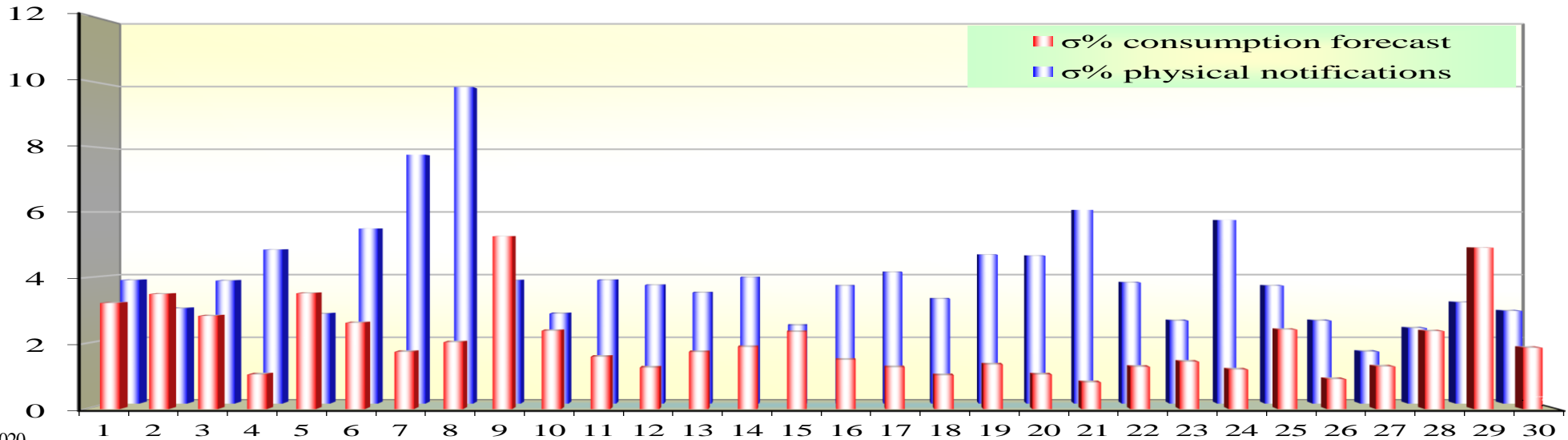
* The average annual value of BM transactions (the absolute sum of upward and downward transactions) was calculated as average of monthly values.



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Balancing Market

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



June 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
σ% consumption forecast	3.23	3.50	2.84	1.05	3.52	2.62	1.74	2.04	5.26	2.38	1.59	1.26	1.74	1.89	2.35	1.50	1.27	1.03	1.36	1.05	0.81	1.29	1.44	1.20	2.42	0.91	1.30	2.37	4.91	1.87
σ% physical notifications	3.87	2.98	3.85	4.82	2.81	5.48	7.79	9.91	3.86	2.82	3.87	3.71	3.47	3.95	2.45	3.69	4.11	3.28	4.66	4.63	6.06	3.79	2.59	5.75	3.69	2.60	1.63	2.36	3.17	2.90

σ_{average} % consumption forecast = 2.06

σ_{average} % physical notifications = 4.02

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

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

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.

June 2020

Downward regulation

	Prices [lei/MWh]			Quantities [MWh]		
	Monthly	Maximum	Minimum	Total	Actually	Deviation
	average			selected	delivered	%
Secondary	0.11	4.00	0.10	49360.78	49360.78	0.00%
Fast Tertiary	4.07	688.00	0.10	122249.32	117756.86	3.67%
Slow Tertiary	1.31	2.00	1.00	2992.00	2992.00	0.00%
				174602.09	170109.63	2.57%

Participants						
	C1	C3	C1	C3	HHI	HHI
Number	(selected)		(actually delivered)		(selected)	(actually delivered)
4	53.20%	99.06%	53.20%	99.06%	3945	3945
7	43.47%	93.86%	43.95%	93.98%	3175	3199
1	100.00%	100.00%	100.00%	100.00%	10000	10000

Upward regulation

	Monthly	Maximum	Minimum	Total	Actually	Deviation
	average			selected	delivered	%
Secondary	604.50	718.00	473.23	21582.66	21582.66	0.00%
Fast Tertiary	411.65	673.21	3.00	26611.92	25489.82	4.22%
Slow Tertiary	-	-	-	-	-	-
				48194.58	47072.48	2.33%

	C1	C3	C1	C3	HHI	HHI
Number	(selected)		(actually delivered)		(selected)	(actually delivered)
4	51.73%	99.29%	51.73%	99.29%	3890	3890
7	49.39%	91.82%	50.16%	92.58%	3815	3882
-	-	-	-	-	-	-



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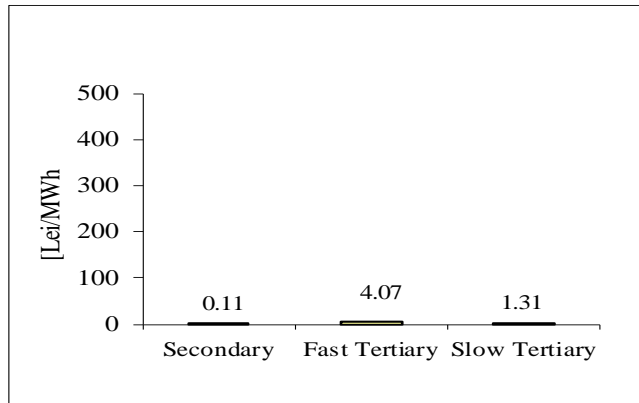
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Balancing Market

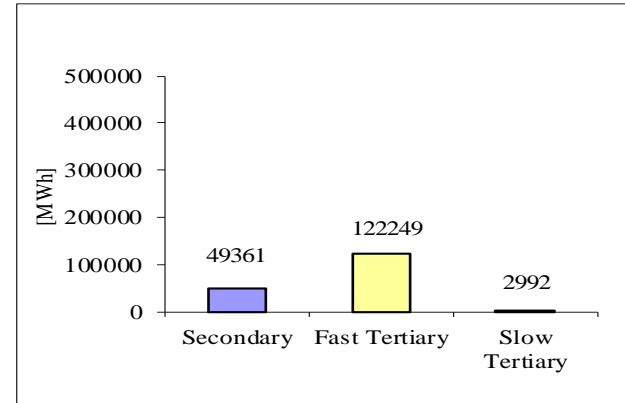
Balancing energy – Selected prices and quantities in June 2020

June 2020

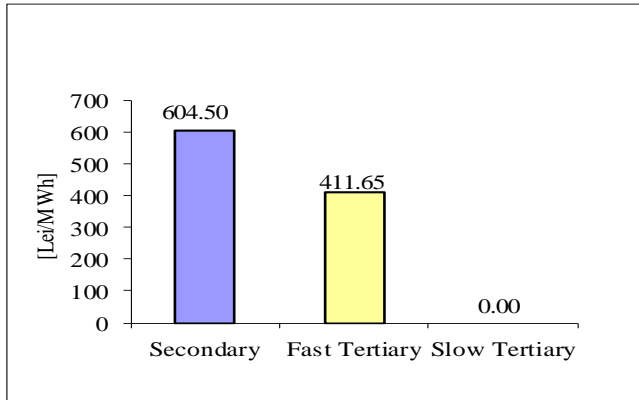
Downward regulation - average price [lei/MWh]



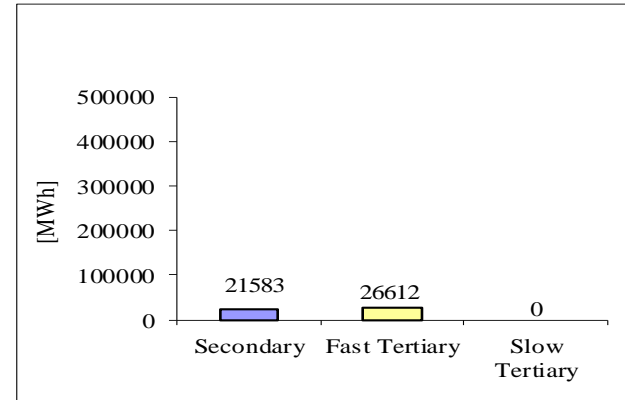
Downward regulation - selected quantities [MWh]



Upward regulation - average price [lei/MWh]



Upward regulation - selected quantities [MWh]



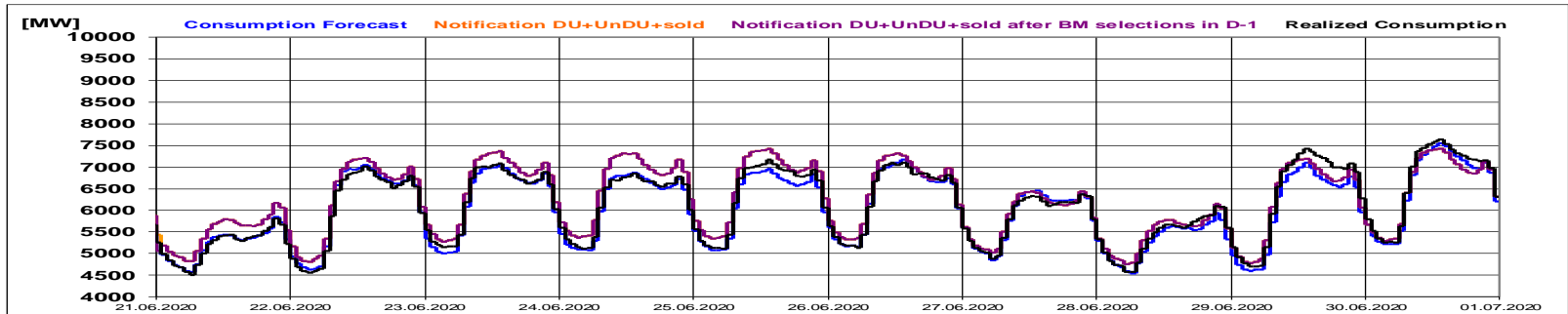
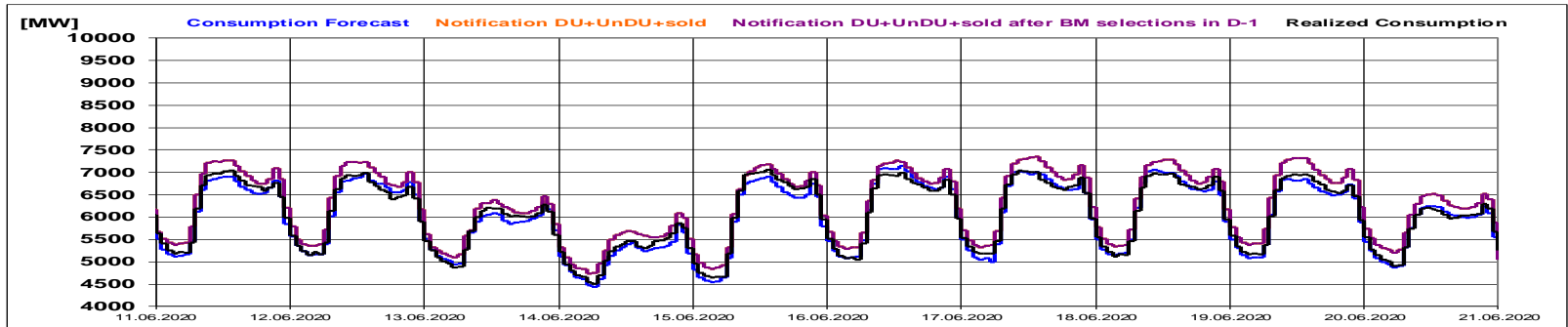
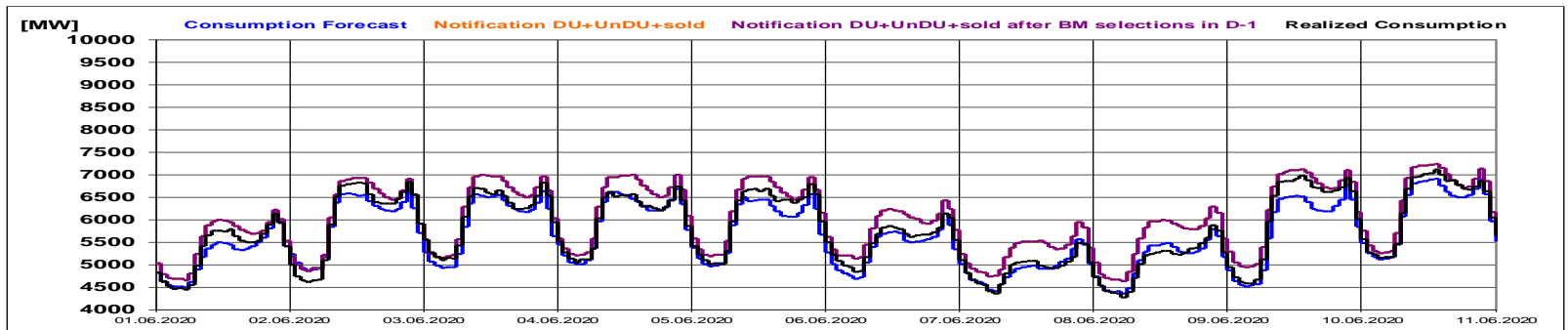


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Balancing Market

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



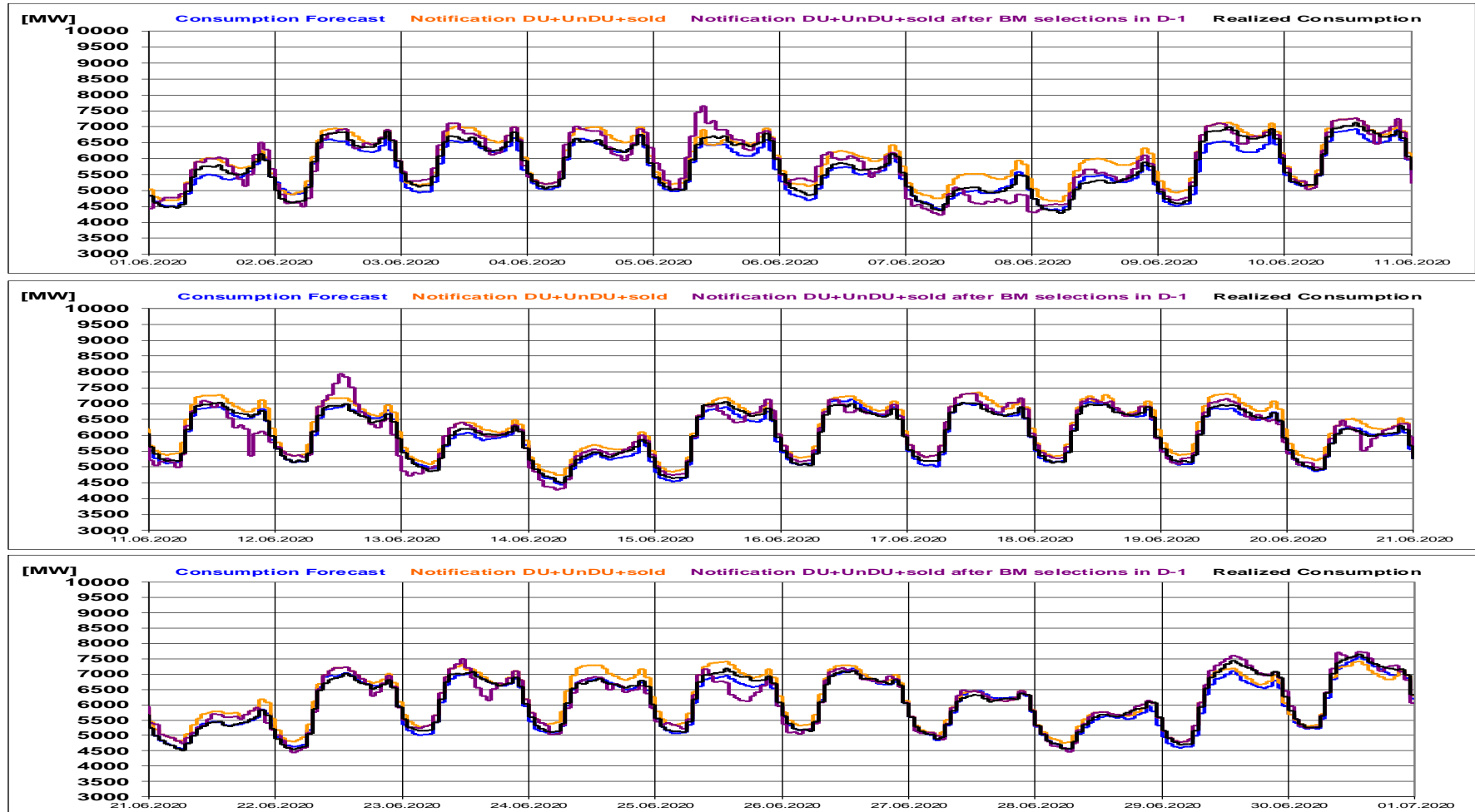


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Balancing Market

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



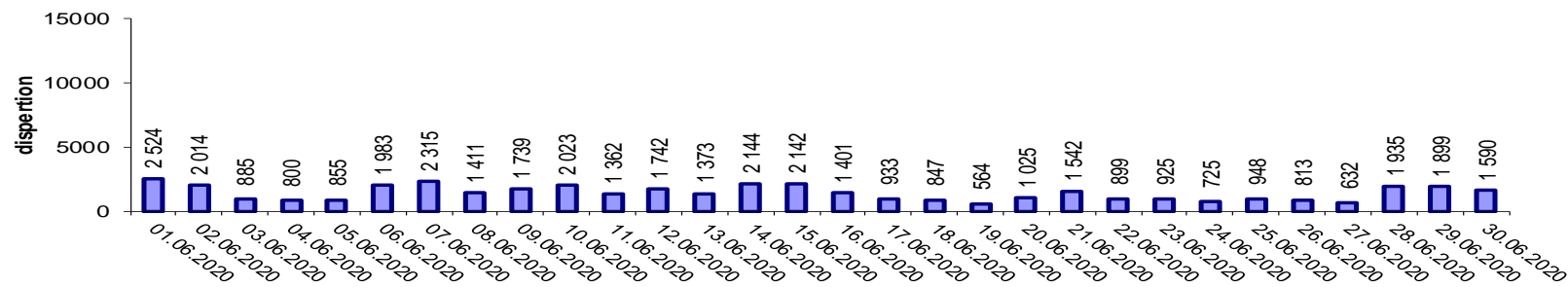


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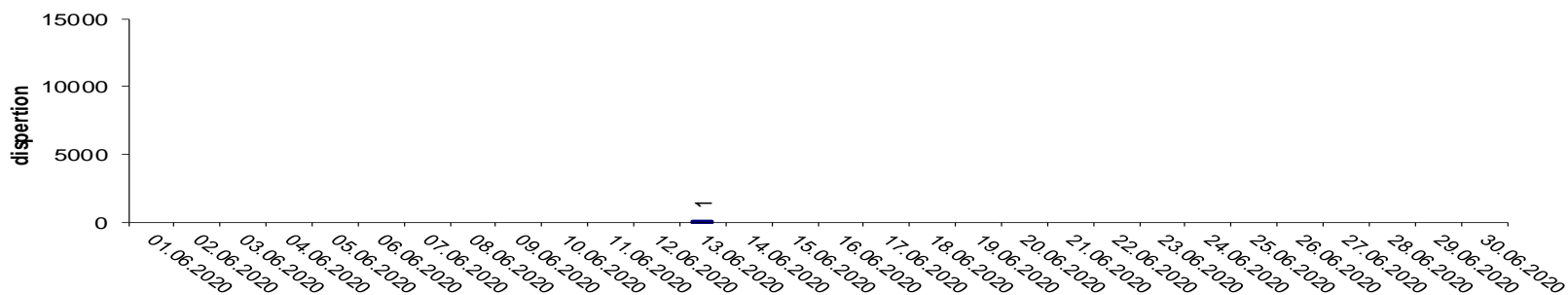
Balancing Market

Indicators – Price Volatility for Secondary Regulation

Price Volatility for Secondary Upward Regulation



Price Volatility for Secondary Downward 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:

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



Email: Monitorizare.Piata@transelectrica.ro

Fax: 021 3035630