

MARKET MONITORING REPORT

Balancing Market

June 2018

Abbrevations

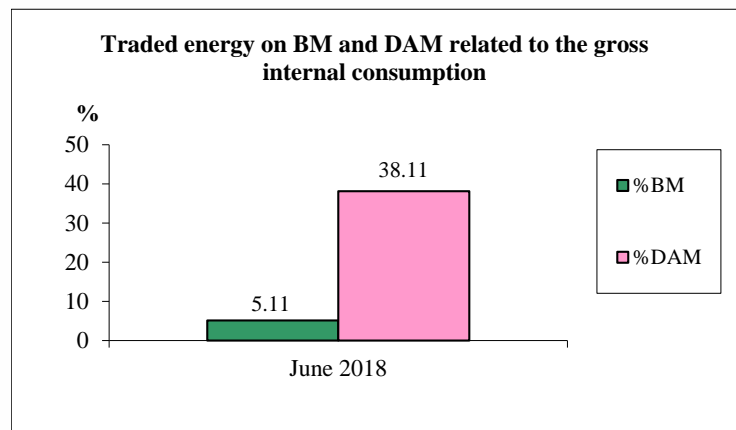
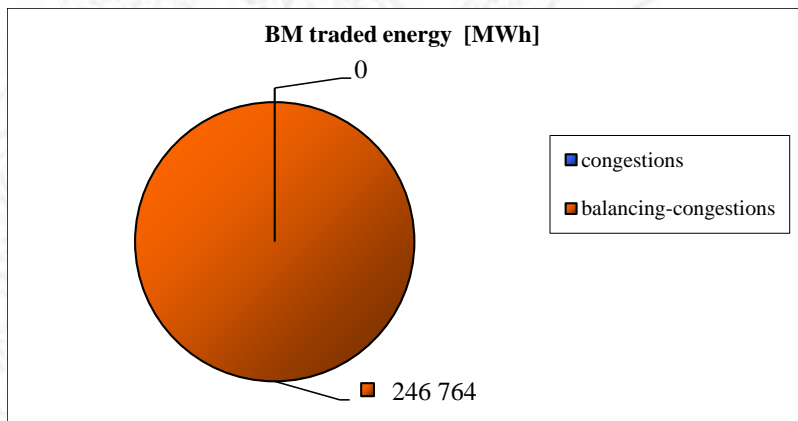
ANRE - Romanian Energy Regulatory Authority
HHI - Herfindahl-Hirschman Index
BRP - Balance Responsible Party
BM - Balancing Market
DAM - Day Ahead Market
TSO - Transmission System Operator
DU – Dispatchable Unit
PN – Physical Notification
NDC - National Dispatching Center
C1 – The market share of the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

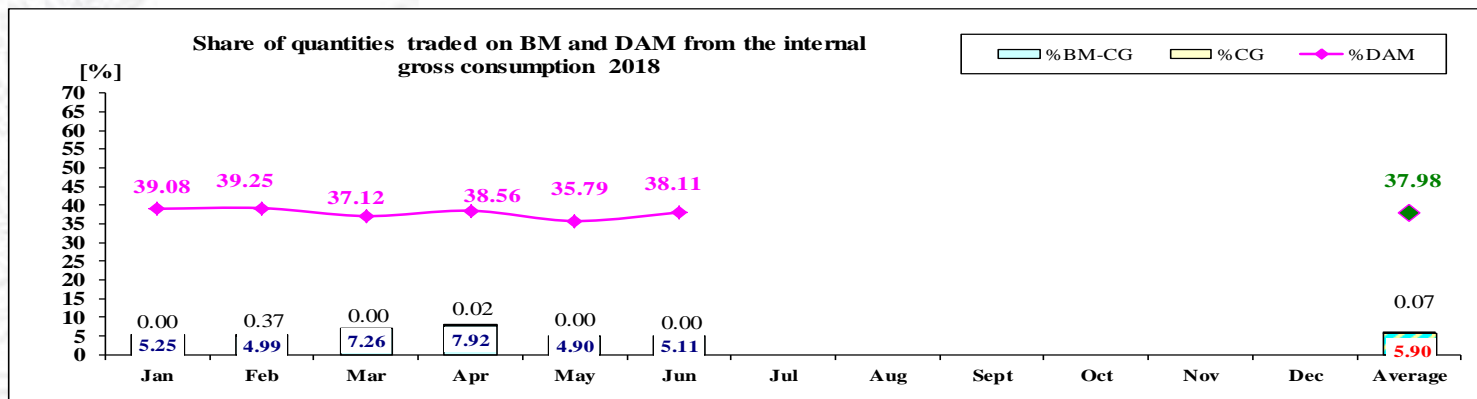
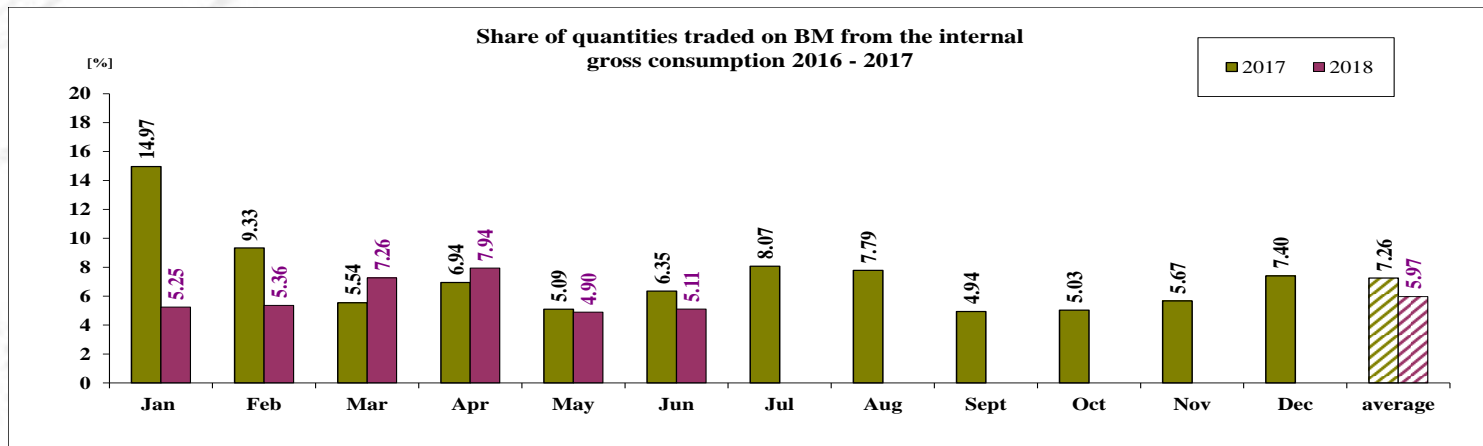
The Balance Generation/Consumption

- The average monthly value of generated power was 6 759 MW and the actual internal gross consumption was 6 710 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being **1.71%**. 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 **2.68%**. The greatest daily deviation regarding the notifications was registered in **24.06 (7.32%)**.
- The energy used in May 2018 for balancing the power system and congestion management was 246 764 MWh (with an average power of 343 MW, which means 5.11% from the internal gross consumption).
- The energy traded in June 2018 on Day Ahead Market was 1 841 301 MWh (with an average power of 2 557 MW, which means 38.11% from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was **48 376 531 lei** (with an average weighted price of 196 lei/MWh).

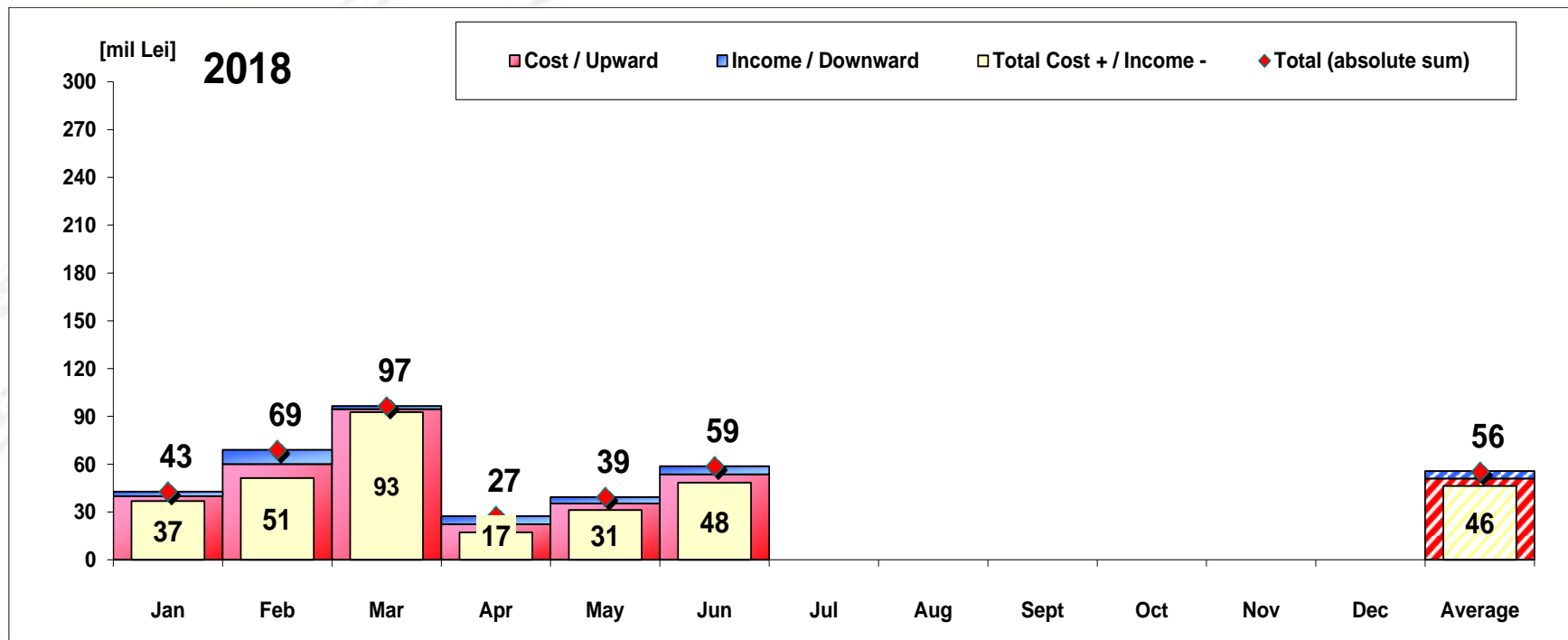


The Balance Generation / Consumption

• 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).



2018													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Average
%BM	5.25	5.36	7.26	7.94	4.90	5.11							5.97
%DAM	39.08	39.25	37.12	38.56	35.79	38.11							37.98
%CG	0.00	0.37	0.00	0.02	0.00	0.00							0.07
%BM-CG	5.25	4.99	7.26	7.92	4.90	5.11							5.90

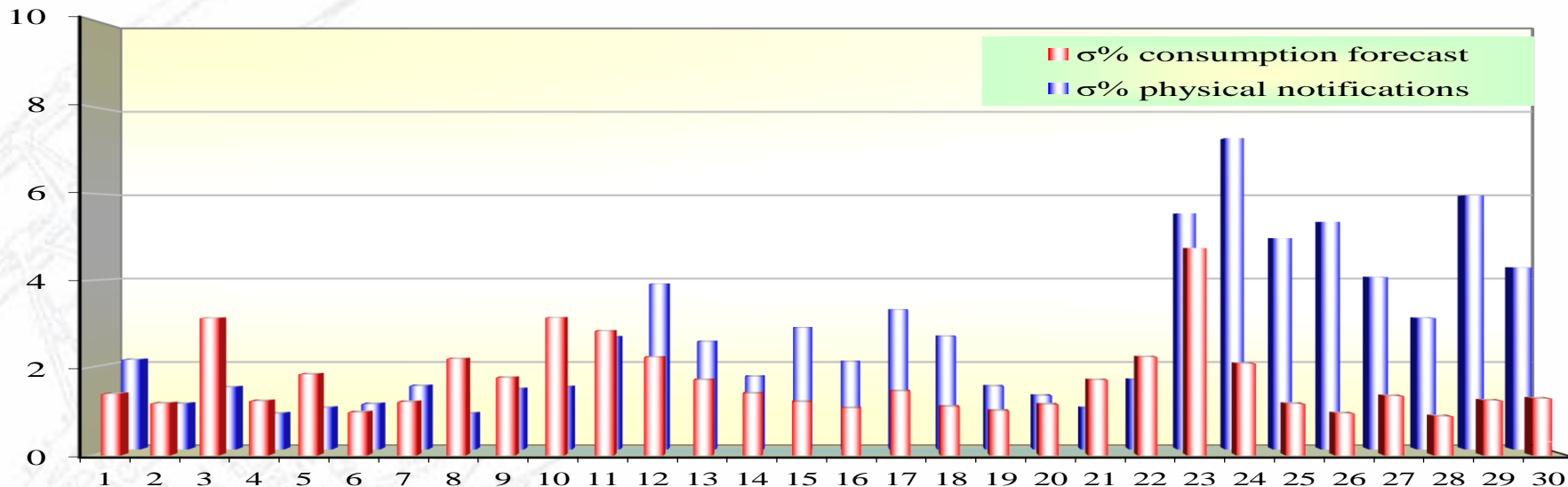


[Lei]	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Average	Total
Cost / Upward	39 819 143	60 149 383	94 609 129	22 294 472	35 295 644	53 570 278							50 956 341	305 738 048
Income / Downward	2 909 103	8 808 101	1 928 773	5 128 228	4 077 888	5 193 747							4 674 307	28 045 839
CE Cost	0	5 234 582	0	154 594	0	0							898 196	5 389 177
Total Cost + /	36 910 039	51 341 283	92 680 357	17 166 243	31 217 756	48 376 531							46 282 035	277 692 209
Total (absolute sum)	42 728 246	68 957 484	96 537 902	27 422 700	39 373 531	58 764 024							55 630 648	333 783 887

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.

Standard deviation of physical notifications and consumption forecast against the actual consumption in June 2018



June 2018

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	1.41	1.19	3.14	1.24	1.86	0.98	1.22	2.21	1.78	3.15	2.85	2.24	1.73	1.42	1.22	1.08	1.47	1.11	1.02	1.16	1.72	2.25	4.74	2.10	1.18	0.96	1.36	0.89	1.25	1.30
σ% physical notifications	2.11	1.07	1.46	0.84	0.97	1.06	1.49	0.84	1.42	1.46	2.65	3.89	2.53	1.71	2.86	2.06	3.28	2.66	1.48	1.26	0.97	1.64	5.55	7.32	4.97	5.35	4.05	3.09	5.98	4.28

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

R = Realized Consumption;

N = Physical Notifications;

P = Consumption Forecast.

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

σ_{average}% consumption forecast = 1.71

σ_{average} % physical notifications = 2.68

Public

Balancing energy – Selected prices and quantities

• At the beginning of the month on the Balancing Market operated 92 BRPs, 113 market participants, holding 226 commercially operating dispatchable units. Starting with 14th of June dispatchable units EDPRVANT (30W-EDPRVANT---8) and EDPRSOLAR (30W-EDPRSOLAR --3) were registered as a result of aggregation between dispatchable units and an undispatchable unit:

- ✓ EDPRVANT contains: ALBE (30W-ALBESTI---0), CECR1 (30W-CECR1-----M), CECR2 (30W-CECR2-----E), COBA (30W-COBADIN---Z), FACAENI (30W-FACAENI---J), PTER (30W-PESTERA---P), SARI (30W-SARICHIOI--G) and VUTC (30W-VUTCANI---6);
- ✓ EDPRSOLAR contains: CUJMIR1 (30W-CUJMIR1---W), CUJMIR2 (30W-CUJMIR2---Q), DABULENI (30W-DABULENI---E), GROJDIBODU (30W-GROJDIBODU-M), VANJUMARE (30W-VANJUMARE--T), BURILA (30W-BURILAMICA-B) and an undispatchable unit BAILESTI.

June 2018

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)		
Secondary	44.93	180.10	0.10	44508.94	44508.94	0.00%	4	64.52%	97.19%	64.52%	97.19%	5066	5066
Fast Tertiary	67.20	291.43	0.10	49713.37	45061.71	9.36%	15	43.66%	99.76%	43.09%	99.78%	3570	3523
Slow Tertiary	105.35	120.60	80.20	1520.83	1426.88	6.18%	2	71.80%	100.00%	70.18%	100.00%	5951	5815
				95743.14	90997.53	4.96%							

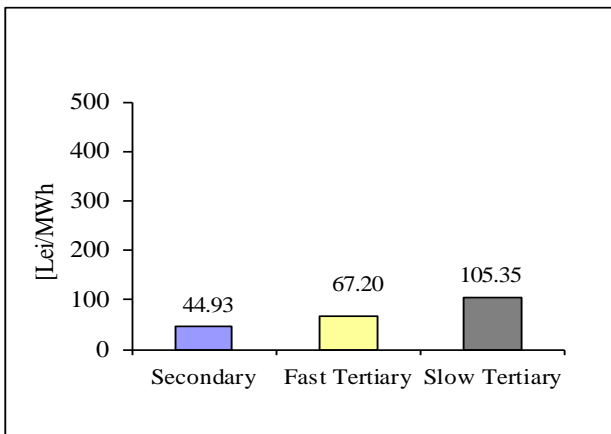
Upward regulation

	Monthly	Maximum	Minimum	Total	Actually	Deviation	C1	C3	C1	C3	HHI	HHI
	average			selected	delivered	%	Number	(selected)	(actually delivered)	(selected)	(actually delivered)	
Secondary	352.68	450.00	250.00	39883.95	39883.95	0.00%	4	63.86%	96.95%	63.86%	96.95%	4998
Fast Tertiary	338.97	450.00	40.00	107196.03	103169.43	3.76%	8	68.21%	89.71%	70.06%	90.02%	5173
Slow Tertiary	330.50	400.00	215.00	13065.42	12713.09	2.70%	6	58.20%	98.25%	59.77%	98.32%	4628
				160145.39	155766.47	2.73%						

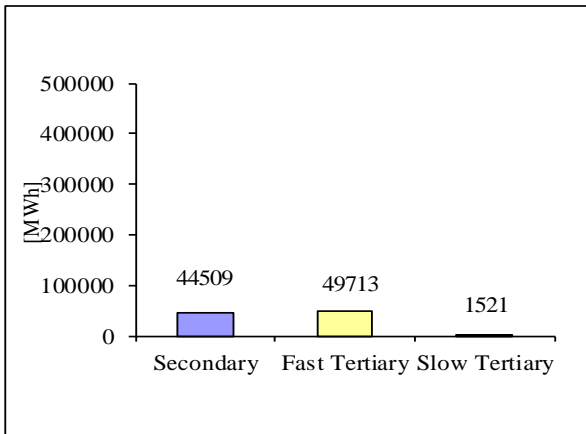
Balancing energy – Selected prices and quantities in June 2018

June 2018

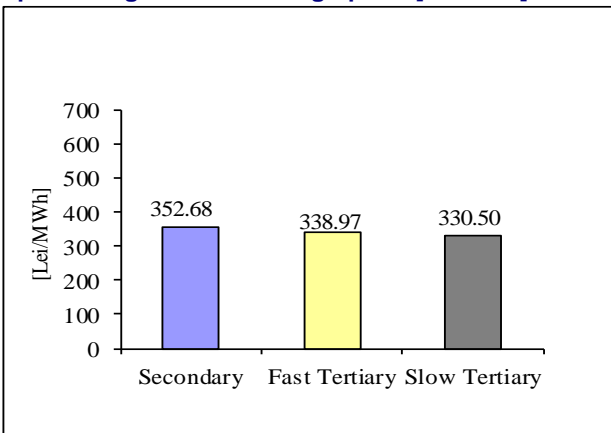
Downward regulation - average price [lei/MWh]



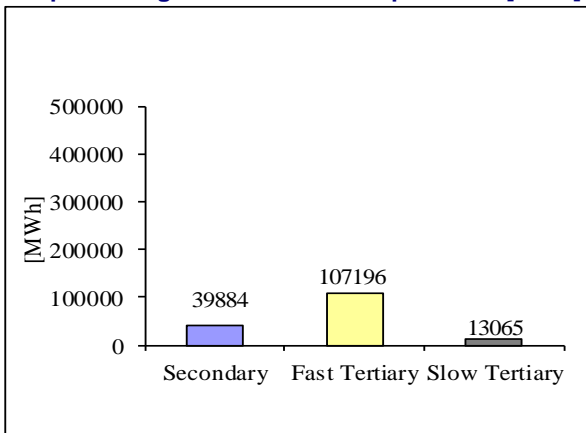
Downward regulation - selected quantities [MWh]



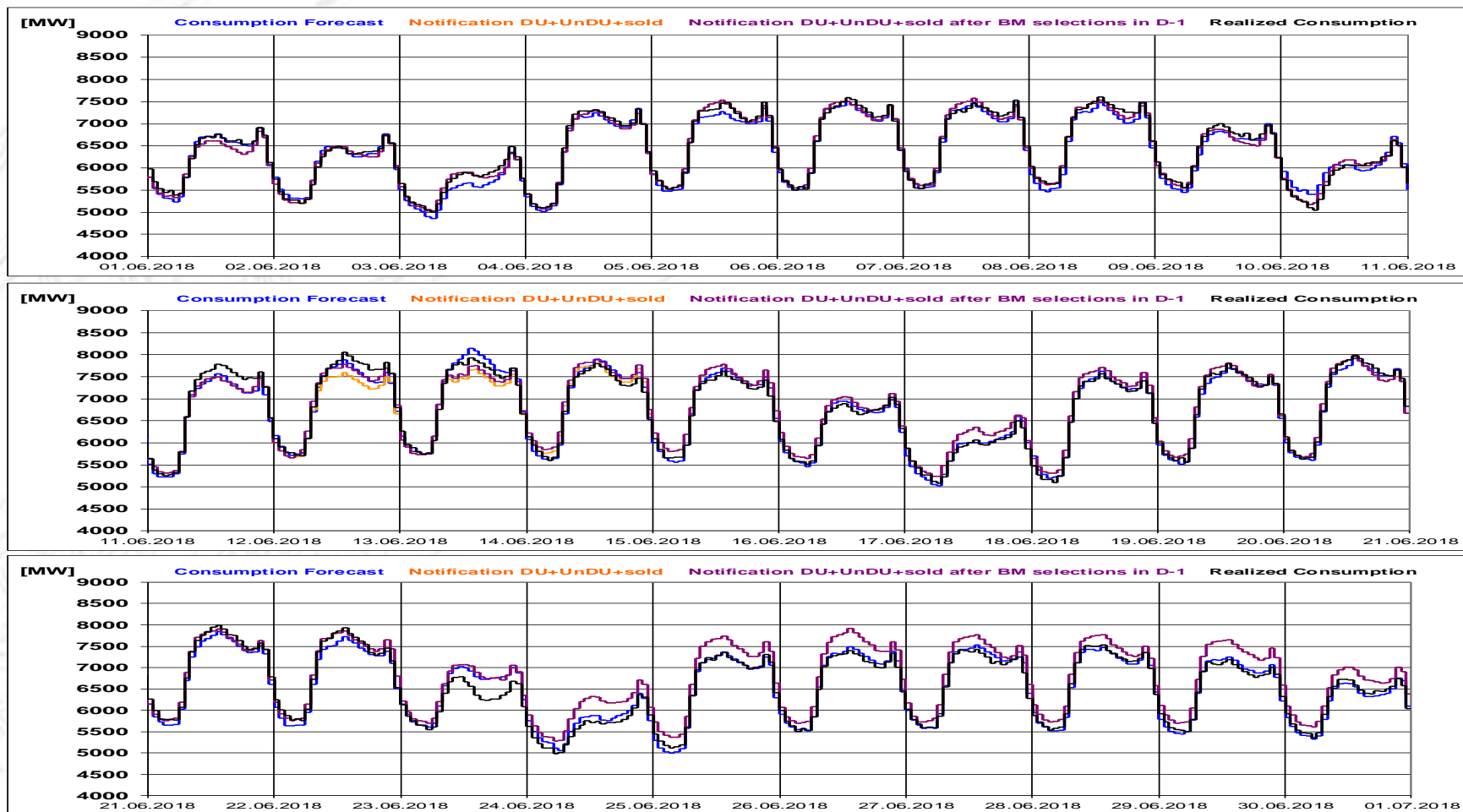
Upward regulation - average price [lei/MWh]



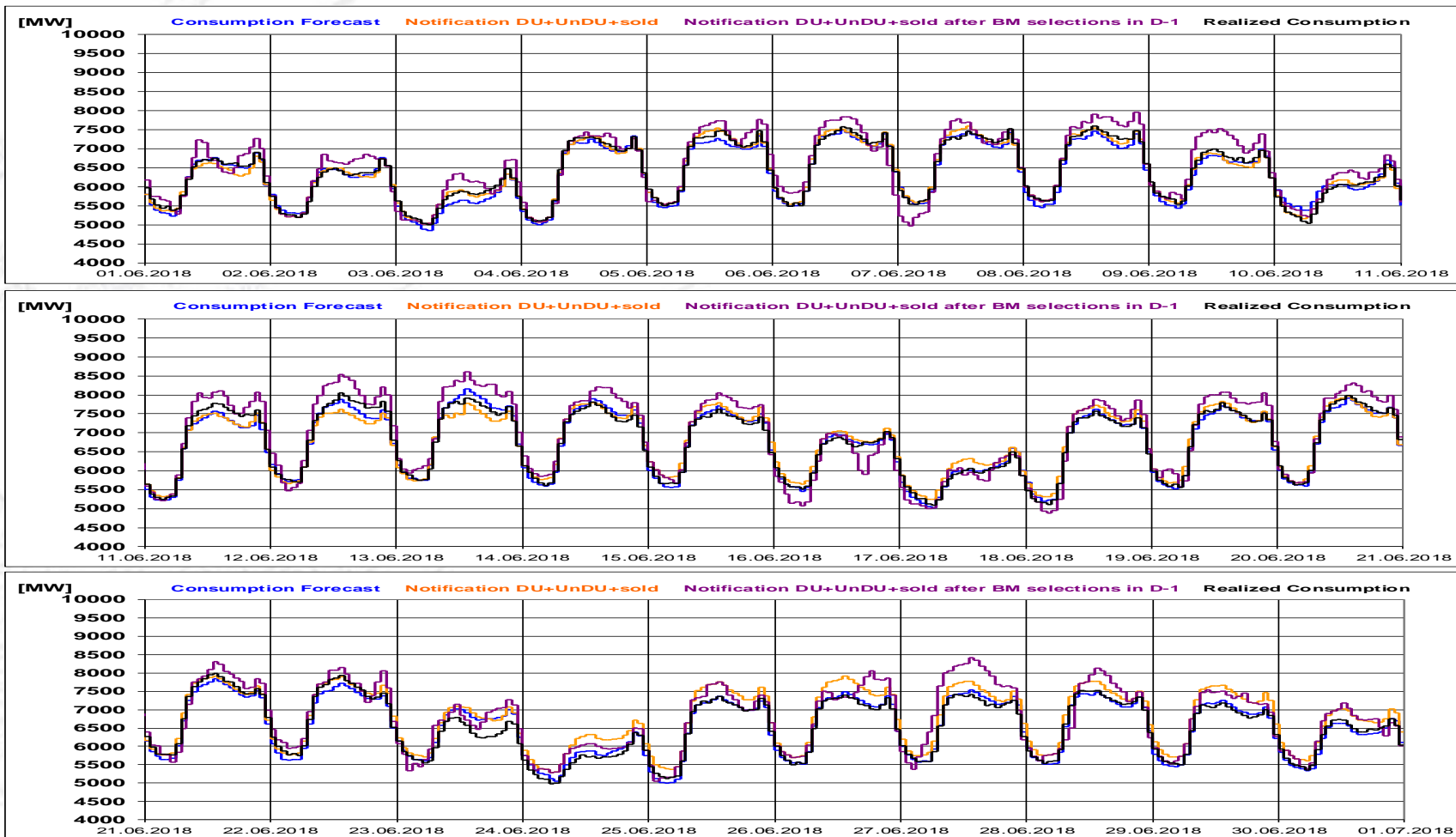
Upward regulation - selected quantities [MWh]



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

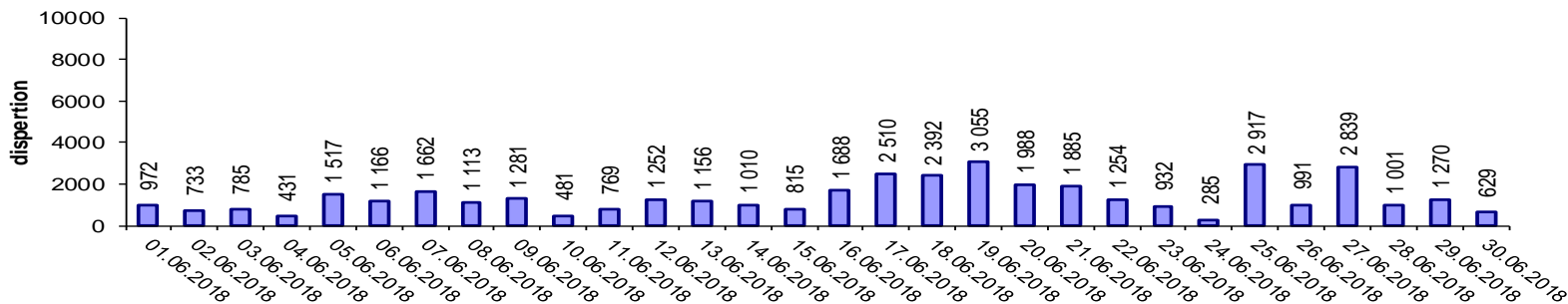


Realized consumption. forecast. notifications. notifications after BM selections in D (end of delivery day)

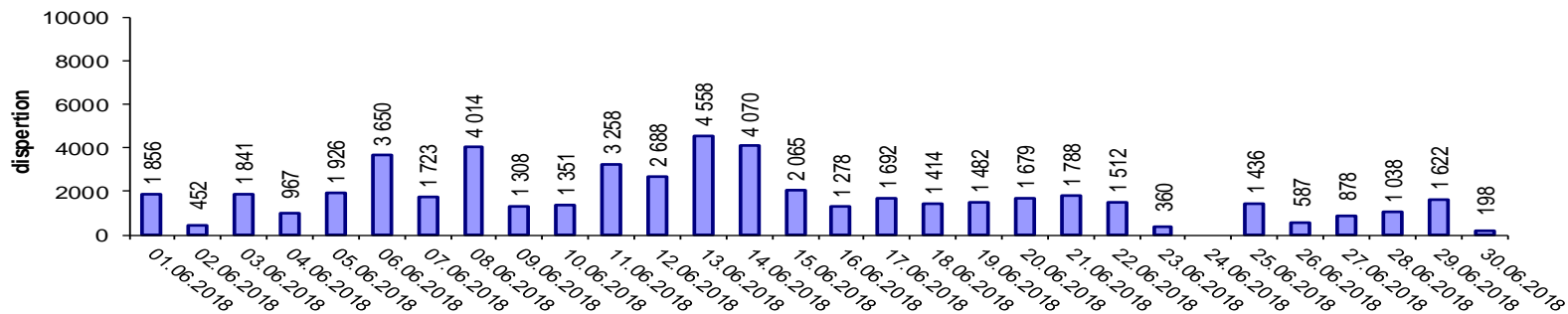


Indicators – Price Volatility for Secondary Regulation

Price Volatility for Secondary Upward Regulation



Price Volatility for Secondary Downward Regulation



Volatility = price dispersion on studied interval:

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

Public

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