



Transelectrica®
Societate Administrată în Sistem Dualist

MARKET MONITORING REPORT

Balancing Market

May 2017



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Societate Administrată în Sistem Dualist

Abbreviations

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



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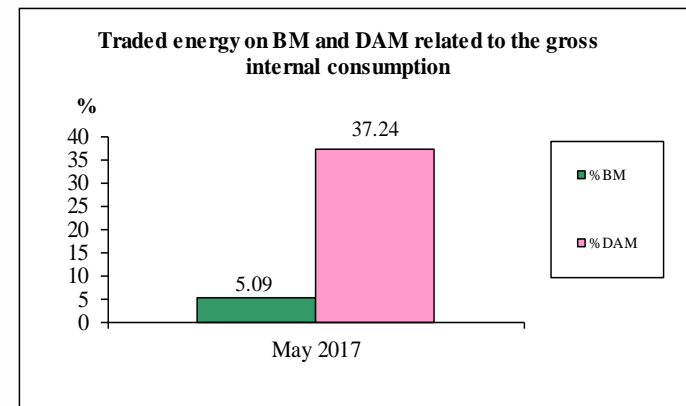
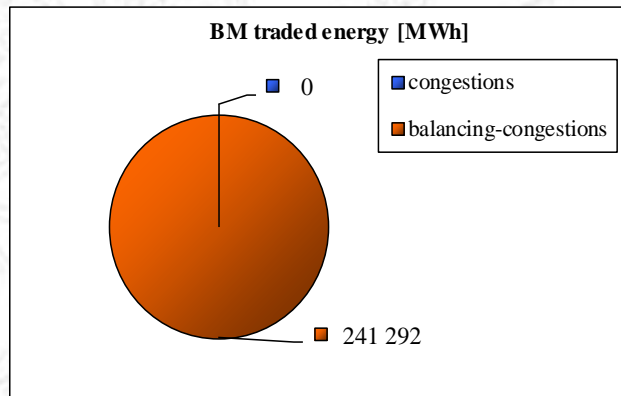
According to the Commercial Code, Transelectrica, the Romanian Transmission System Operator, operates and monitors the activity of 3 types of markets: Balancing Market, Ancillary Services Market and Market for Allocation of Cross-Border Capacities.

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 6 413 MW and the actual internal gross consumption was 6 366 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being 1,81 %. 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 5,26 %. The greatest daily deviation, regarding the notifications, was registered in 01.05 (10,60 %).
- The energy used in May 2017 for balancing the power system and congestion management was 241 292 MWh (with an average power of 324 MW, which means **5,09** % from the internal gross consumption).
- The energy traded in May 2017 on Day Ahead Market was 1 763 830 MWh (with an average power of 2 371 MW, which means **37,24** % from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 31 465 033 lei (with an average weighted price of 130 lei/MWh).





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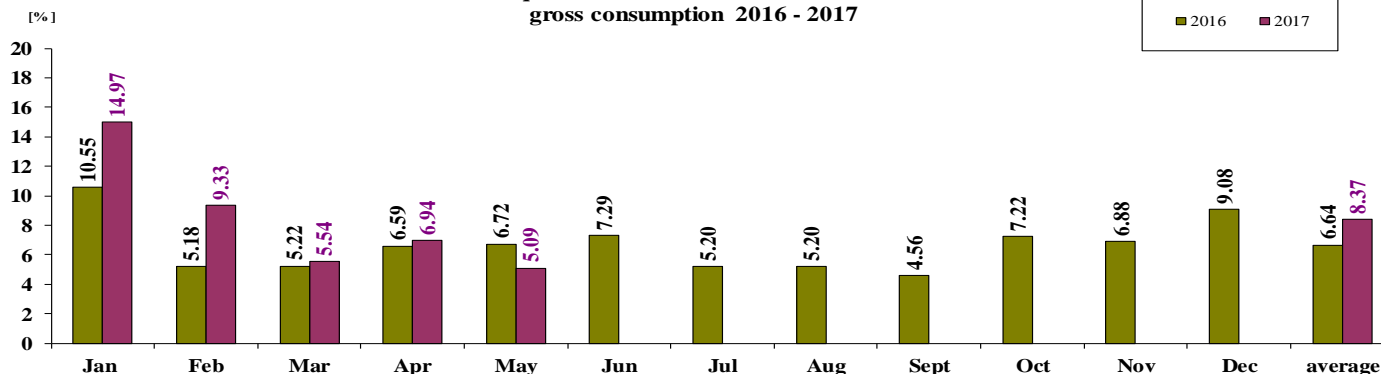
Balancing Market

The Balance Generation / Consumption

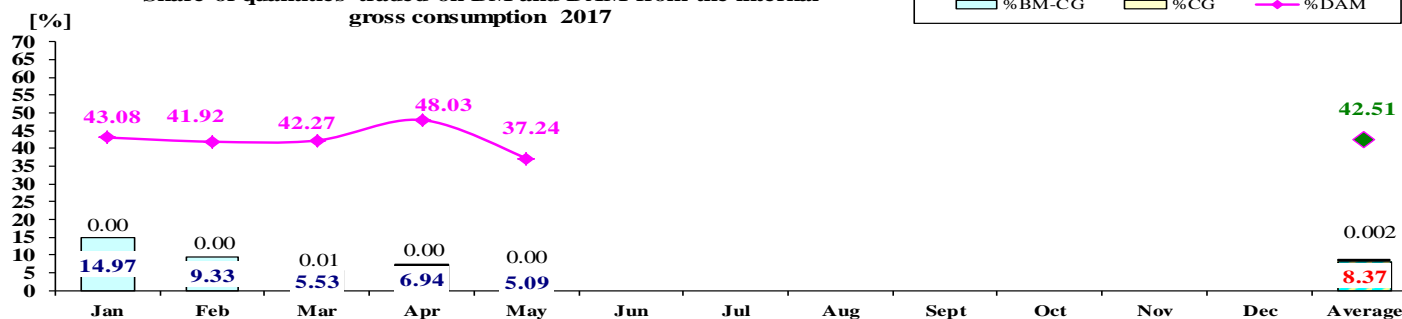
• Monthly percentage values resulted are calculated as ratio between traded volumes on BM and gross internal consumption.

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).

Share of quantities traded on BM from the internal gross consumption 2016 - 2017



Share of quantities traded on BM and DAM from the internal gross consumption 2017



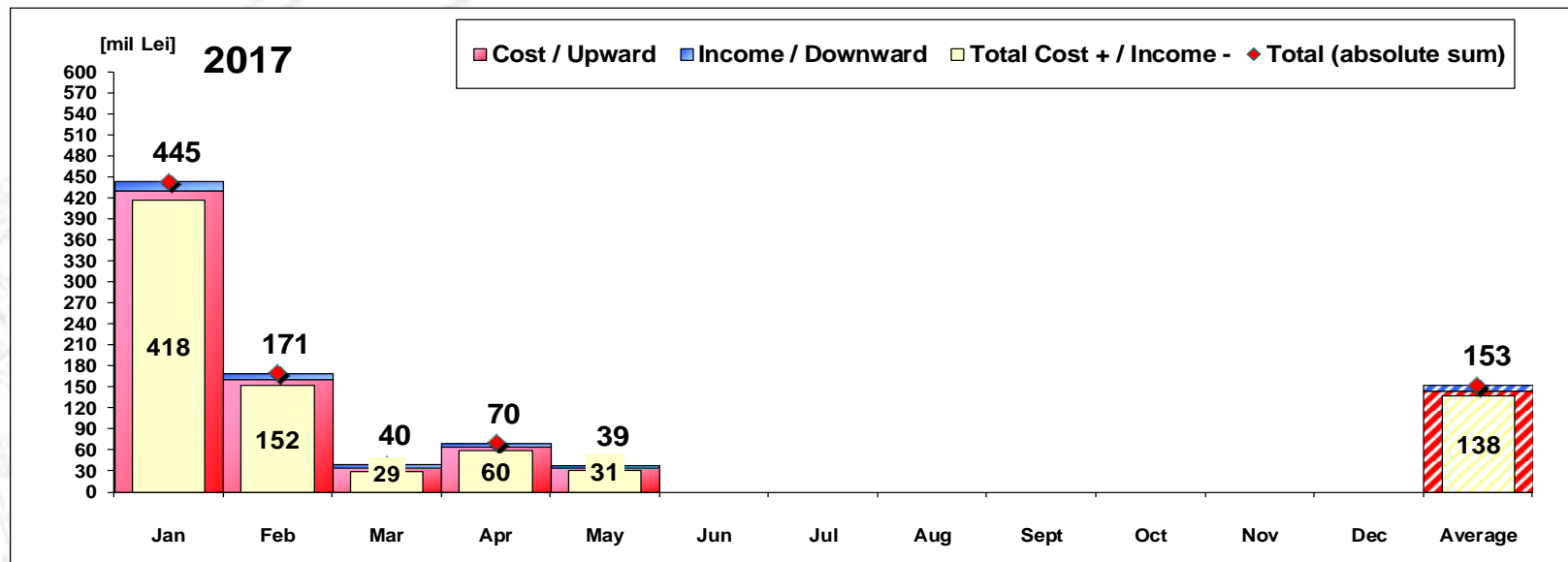
	2017												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Average
%BM	14.97	9.33	5.54	6.94	5.09								8.37
%DAM	43.08	41.92	42.27	48.03	37.24								42.51
%CG	0.00	0.00	0.01	0.00	0.00								0.002
%BM-CG	14.97	9.33	5.53	6.94	5.09								8.37



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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	431 393 249	161 133 423	34 549 755	65 001 668	35 309 182								145 477 455	727 387 277
Income / Downward	13 186 568	9 389 350	5 081 592	5 304 021	3 844 149								7 361 136	36 805 680
CE Cost	0	0	39 746	1 614	0								8 272	41 360
Total Cost + / Income -	418 206 681	151 744 073	29 468 163	59 697 647	31 465 033								138 116 319	690 581 597
Total (absolute sum)	444 579 817	170 522 773	39 631 347	70 305 689	39 153 331								152 838 591	764 192 956

CE – Congestion Energy

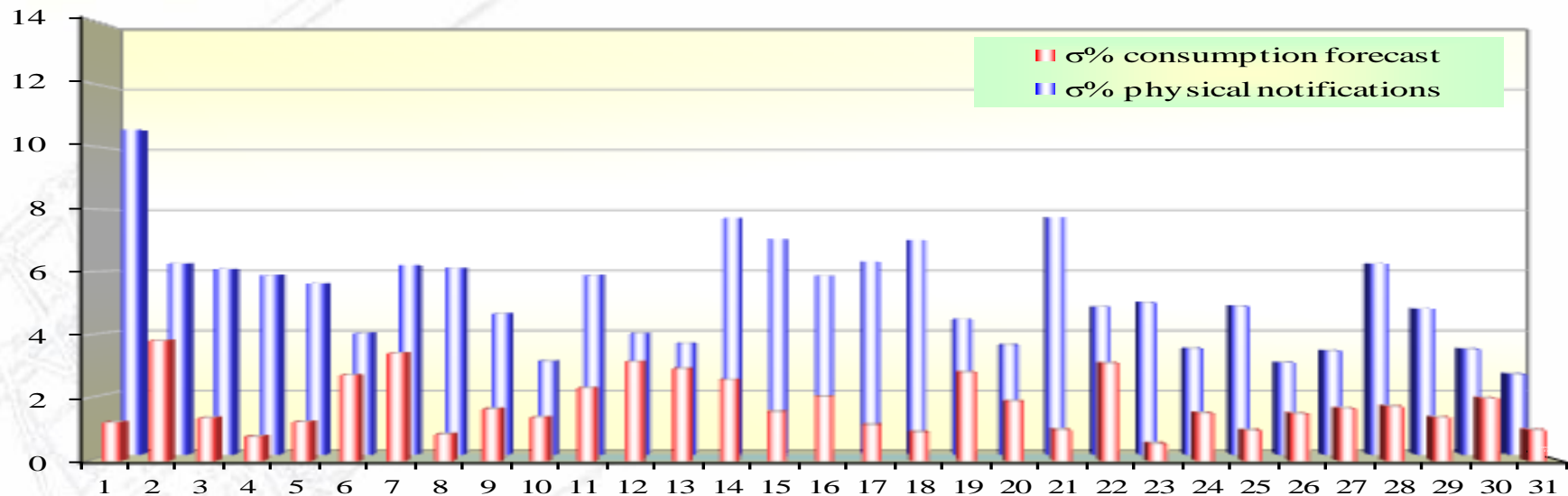
* The average annual value of BM transactions (the absolute sum of upward and downward transactions) was calculated as average of monthly values.



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Standard deviation of physical notifications and consumption forecast against the actual consumption in May 2017



May 2017

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 forecast	1.22	3.82	1.36	0.78	1.23	2.72	3.42	0.84	1.64	1.38	2.31	3.14	2.93	2.57	1.56	2.04	1.14	0.91	2.81	1.89	0.98	3.10	0.55	1.52	0.97	1.50	1.67	1.73	1.38	1.99	0.98
σ% physical notifications	10.60	6.24	6.06	5.87	5.58	3.97	6.19	6.09	4.61	3.05	5.86	3.96	3.64	7.72	7.04	5.84	6.31	7.02	4.42	3.58	7.75	4.83	4.97	3.47	4.86	3.00	3.40	6.24	4.76	3.45	2.63

σ average % consumption forecast = 1.81

σ average % physical notifications = 5.26

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

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

Public

R = Realized Consumption;

N = Physical Notifications;

P = Consumption Forecast.

Balancing energy – Selected prices and quantities

- At the beginning of the month on the Balancing Market operated 92 BRPs, 123 market participants, holding 238 commercially operating dispatchable units.

May 2017

Downward regulation

	Prices [lei/MWh]			Quantities [MWh]		
	Monthly	Maximum	Minimum	Total	Actually	Deviation
	average			selected	delivered	%
Secondary	24.19	110.00	0.10	52374.50	52374.50	0.00%
Fast Tertiary	38.48	268.00	0.10	71201.56	63778.42	10.43%
Slow Tertiary	21.52	50.40	0.20	4016.83	3837.43	4.47%
				127592.89	119990.35	5.96%

Upward regulation

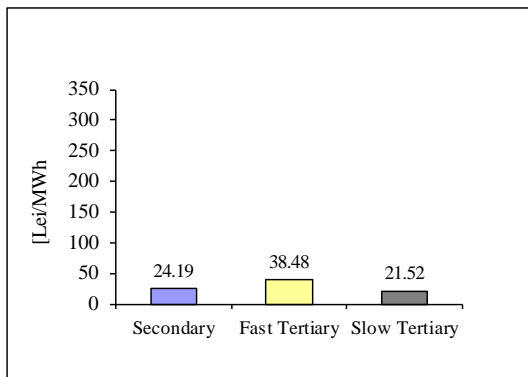
	Monthly	Maximum	Minimum	Total	Actually	Deviation
	average			selected	delivered	%
Secondary	311.29	450.00	250.00	38057.33	38057.33	0.00%
Fast Tertiary	276.03	400.00	0.10	76696.01	73735.02	3.86%
Slow Tertiary	301.16	348.00	50.00	10216.33	9509.32	6.92%

Participants						
	C1	C3	C1	C3	HHI	HHI
Number	(selected)		(actually delivered)		(selected)	(actually delivered)
4	54.18%	96.56%	54.18%	96.56%	4444	4444
10	53.16%	99.91%	53.16%	99.91%	5007	5008
3	94.78%	100.00%	95.31%	100.00%	9011	9106

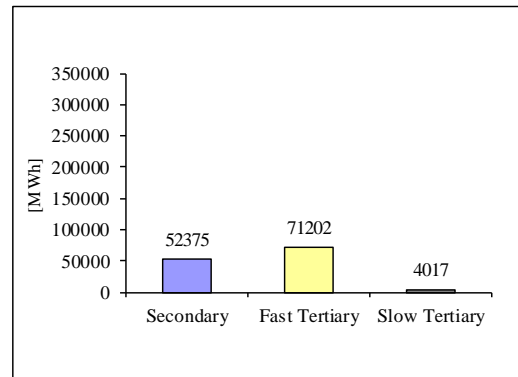
Participants						
	C1	C3	C1	C3	HHI	HHI
Number	(selected)		(actually delivered)		(selected)	(actually delivered)
4	53.75%	96.73%	53.75%	96.73%	4464	4464
9	77.69%	92.70%	79.47%	93.15%	6170	6430
5	83.90%	99.01%	82.98%	99.12%	7200	7070

Balancing energy – Selected prices and quantities in May 2017

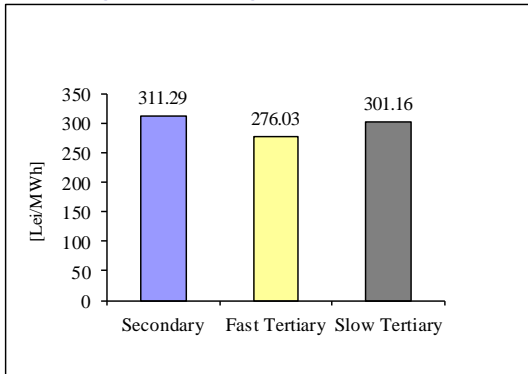
Downward regulation - average price [lei/MWh]



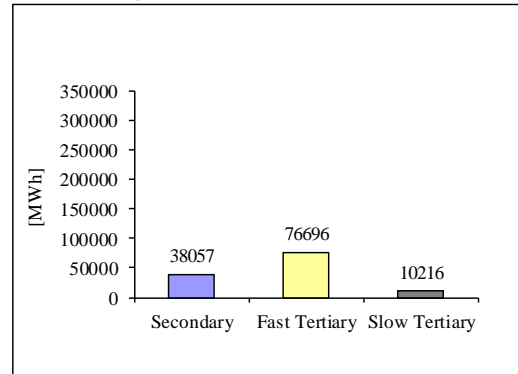
Downward regulation - selected quantities [MWh]



Upward regulation - average price [lei/MWh]



Upward regulation - selected quantities [MWh]



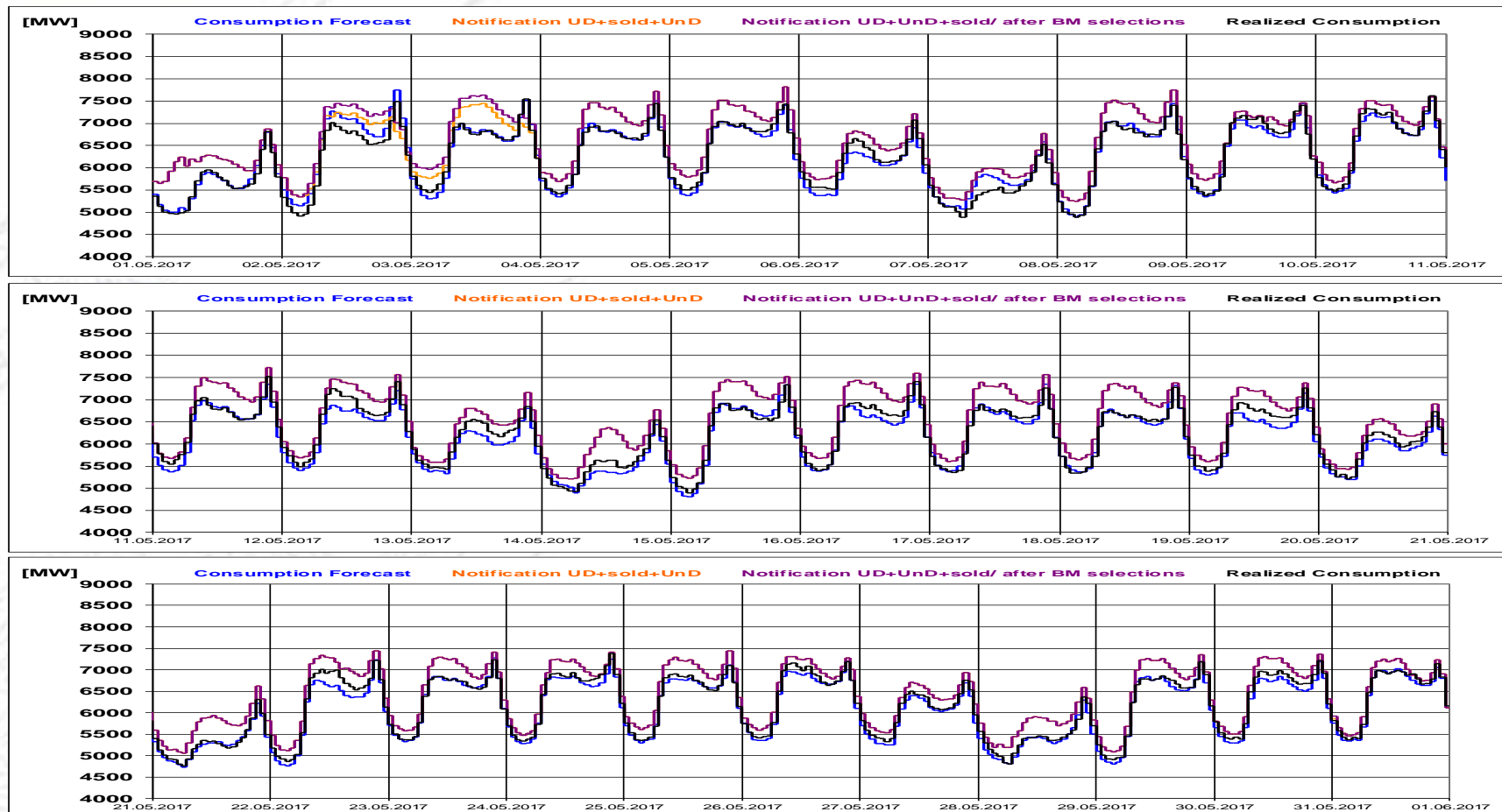


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Realized consumption. forecast. notifications.
notifications after BM selections in D-1



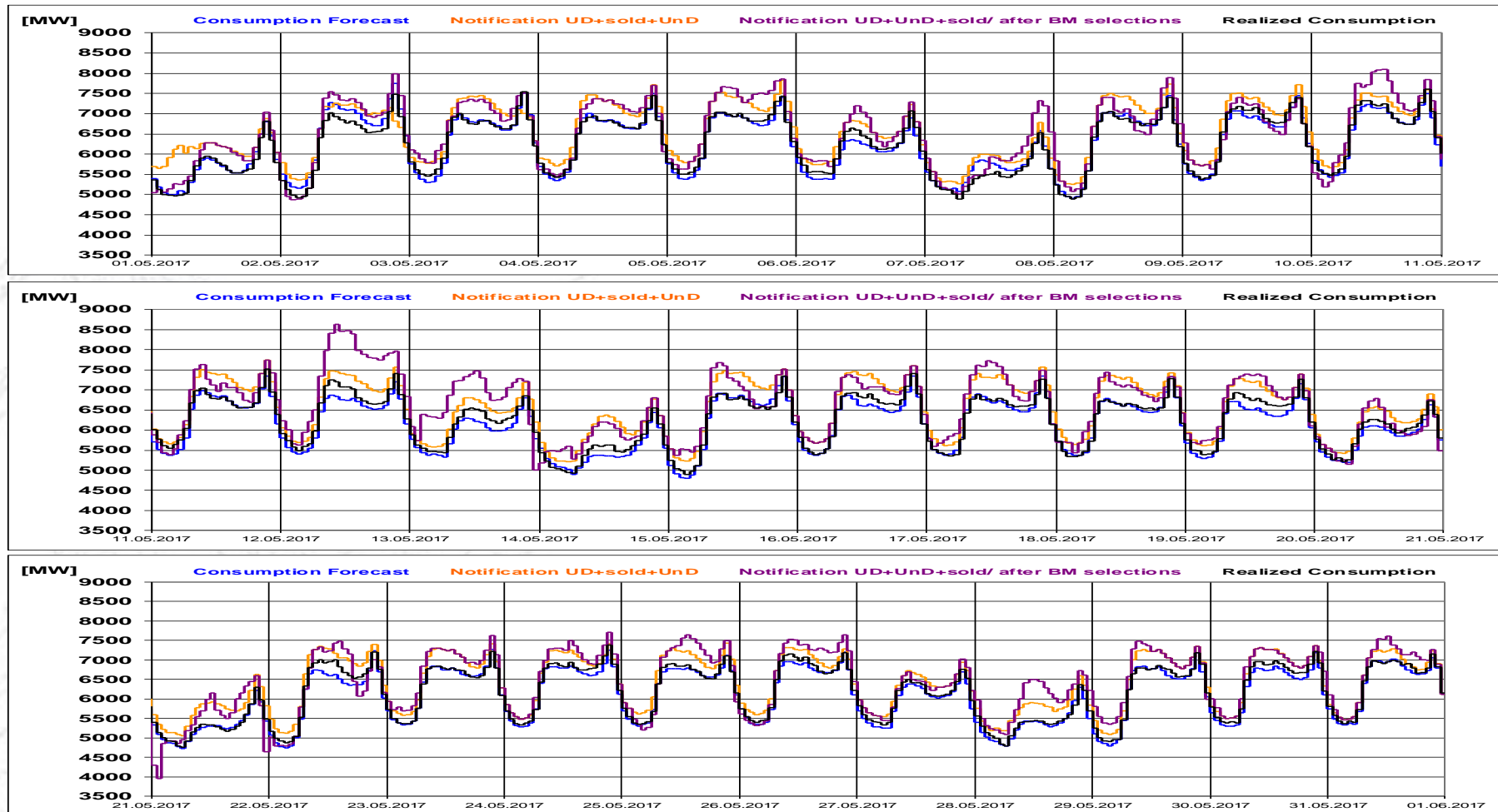


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Balancing Market

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





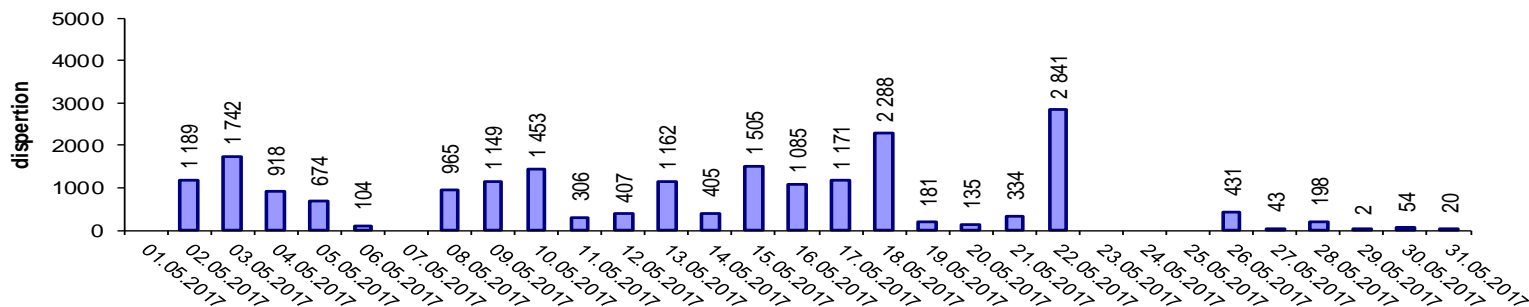
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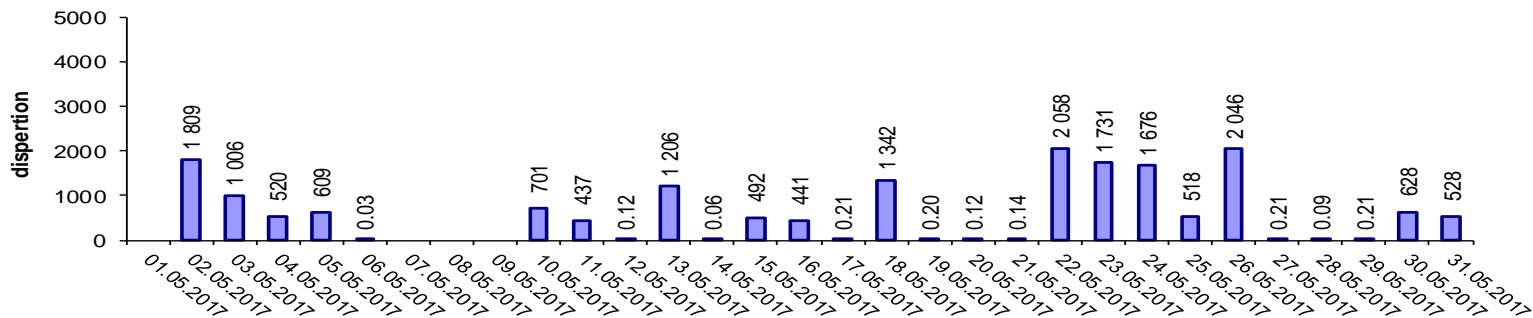
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Indicators – Price Volatility for Secondary Regulation

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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Email: monitorizare@transelectrica.ro

Fax: 021 3035630