



Transelectrica®
Societate Administrată în Sistem Dualist

MARKET MONITORING REPORT

Balancing Market

September 2017



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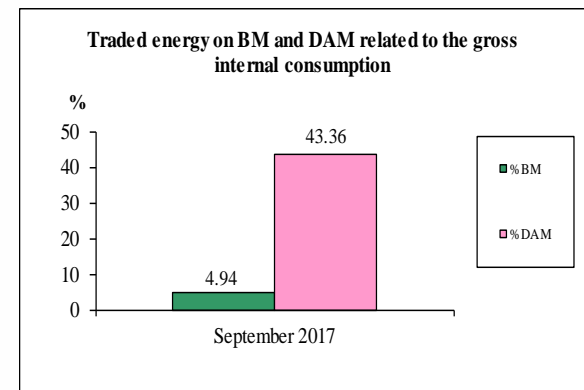
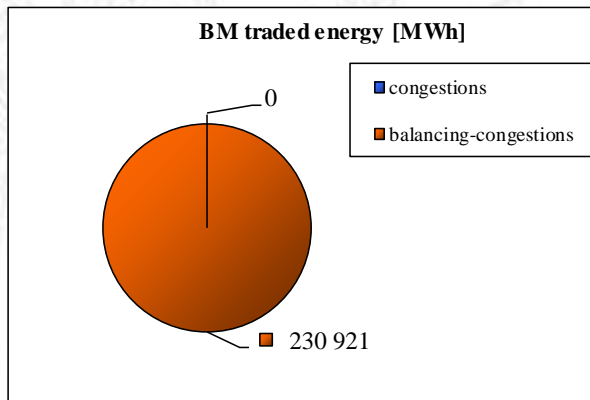
According to the Commercial Code, Transelectrica, the Romanian Transmission System Operator, operates and monitors the activity of 3 types of markets: Balancing Market, Ancillary Services Market and Market for Allocation of Cross-Border Capacities.

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 6 607 MW and the actual internal gross consumption was 6 496 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being 1,55 %. 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 3,18 %. The greatest daily deviation, regarding the notifications, was registered in 24.09 (5,28 %).
- The energy used in September 2017 for balancing the power system and congestion management was 230 921 MWh (with an average power of 321 MW, which means **4,94** % from the internal gross consumption).
- The energy traded in September 2017 on Day Ahead Market was 2 028 168 MWh (with an average power of 2 817 MW, which means **43,36** % from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 32 894 619 lei (with an average weighted price of 142 lei/MWh).





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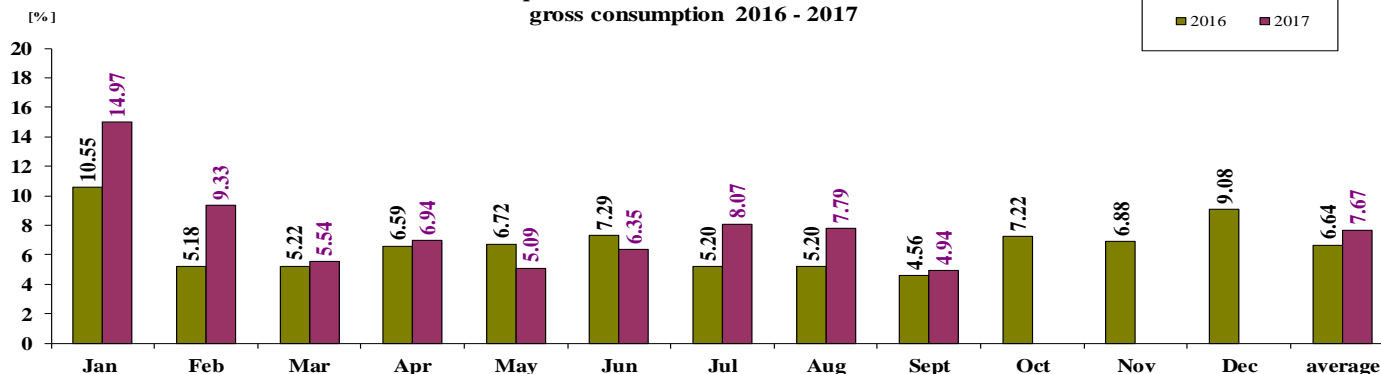
Balancing Market

The Balance Generation / Consumption

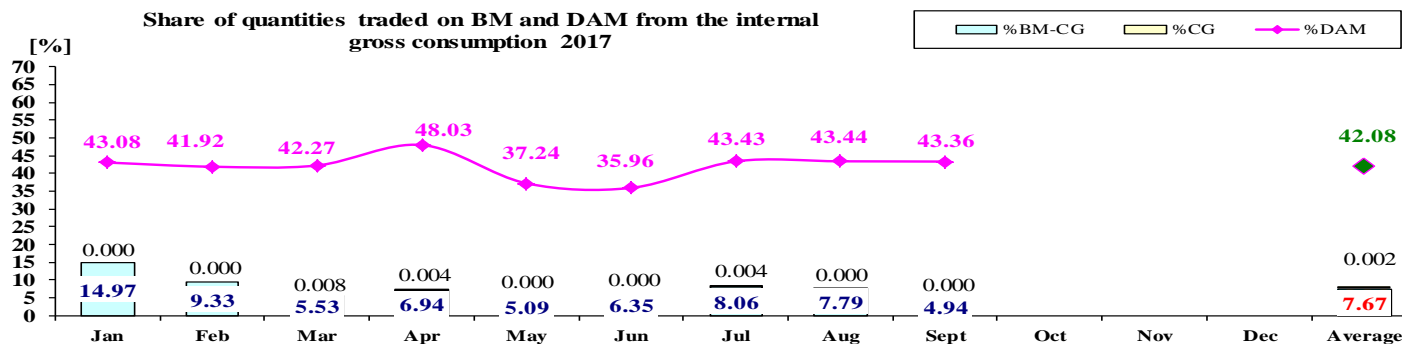
• Monthly percentage values resulted are calculated as ratio between traded volumes on BM and gross internal consumption.

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



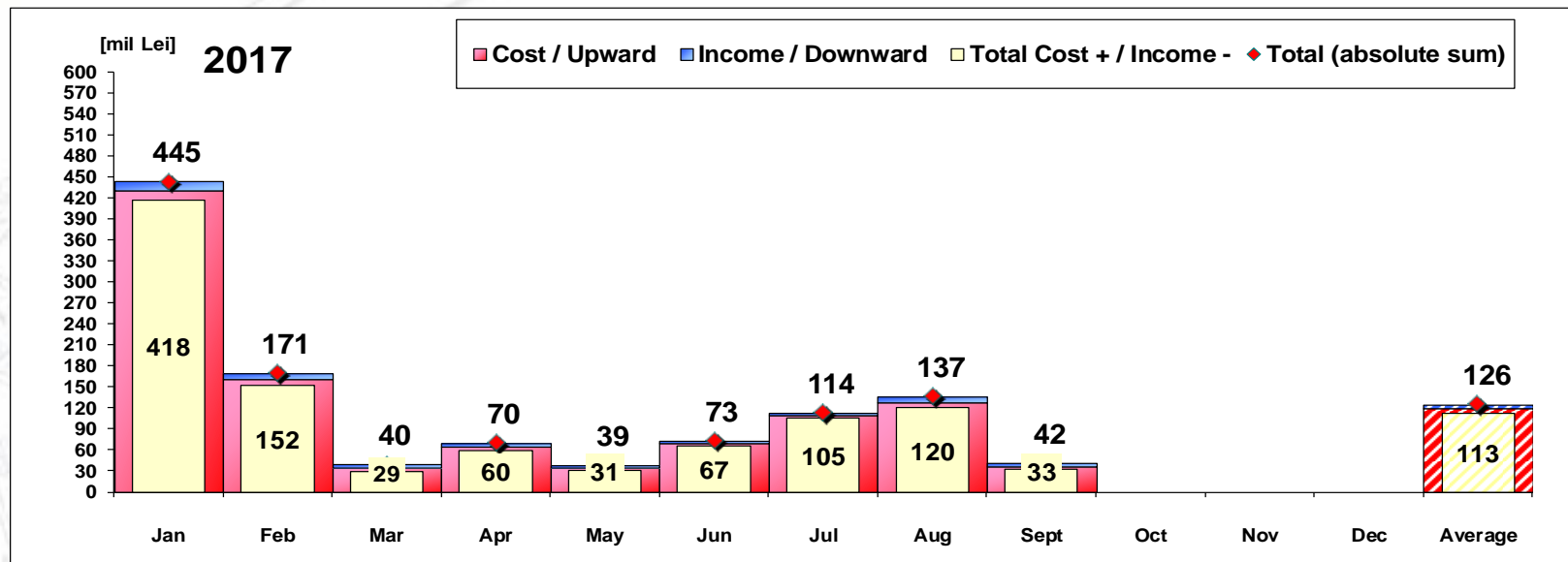
	2017												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Average
%BM	14.97	9.33	5.54	6.94	5.09	6.35	8.07	7.79	4.94				7.67
%DAM	43.08	41.92	42.27	48.03	37.24	35.96	43.43	43.44	43.36				42.08
%CG	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00				0.002
%BM-CG	14.97	9.33	5.53	6.94	5.09	6.35	8.06	7.79	4.94				7.67



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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	70 005 187	109 496 928	128 792 754	37 214 349				119 210 722	1072 896 494
Income / Downward	13 186 568	9 389 350	5 081 592	5 304 021	3 844 149	3 382 836	4 036 941	8 429 060	4 319 729				6 330 472	56 974 246
CE Cost	0	0	39 746	1 614	0	0	52 284	0	0				10 405	93 643
Total Cost + / Income -	418 206 681	151 744 073	29 468 163	59 697 647	31 465 033	66 622 351	105 459 987	120 363 694	32 894 619				112 880 250	1015 922 248
Total (absolute sum)	444 579 817	170 522 773	39 631 347	70 305 689	39 153 331	73 388 022	113 533 869	137 221 813	41 534 078				125 541 193	1129 870 740

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.

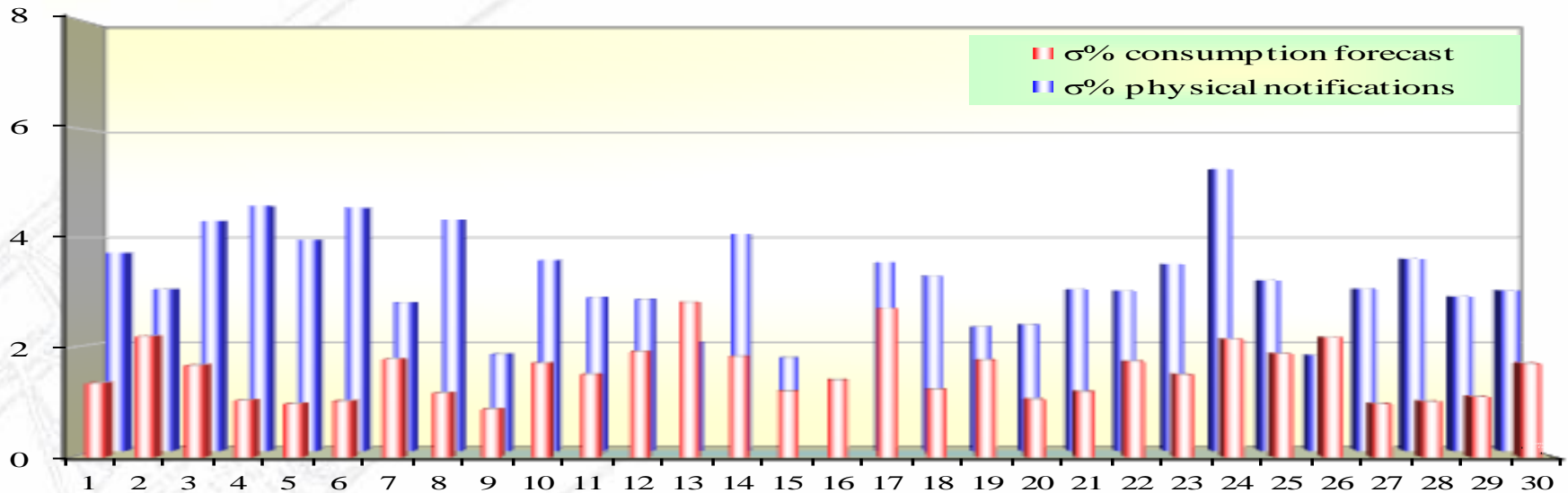


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Standard deviation of physical notifications and consumption forecast against the actual consumption in September 2017



September 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
σ% consumption forecast	1.34	2.20	1.67	1.03	0.97	1.02	1.78	1.16	0.87	1.71	1.51	1.92	2.82	1.83	1.20	1.40	2.71	1.23	1.77	1.05	1.19	1.74	1.50	2.15	1.88	2.18	0.97	1.01	1.10	1.70
σ% physical notifications	3.71	3.03	4.31	4.59	3.96	4.56	2.78	4.33	1.81	3.58	2.88	2.84	2.03	4.06	1.74	1.33	3.53	3.28	2.32	2.36	3.03	3.00	3.50	5.28	3.19	1.79	3.03	3.60	2.89	3.01

σ_{average}% consumption forecast = 1.55

σ_{average} % physical notifications = 3.18

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

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

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 90 BRPs, 124 market participants, holding 241 commercially operating dispatchable units.

September 2017

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	25.17	250.00	0.10	46152.29	46152.29	0.00%	4	57.13%	99.66%	57.13%	99.66%	4826	4826
Fast Tertiary	52.59	299.00	0.10	63880.52	58671.95	8.15%	8	52.25%	99.76%	52.03%	99.83%	3861	3864
Slow Tertiary	33.00	50.40	1.00	1323.42	1263.89	4.50%	3	67.05%	100.00%	69.63%	100.00%	5081	5386
				111356.23	106088.14	4.73%							

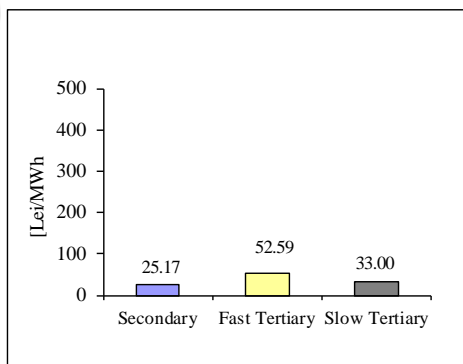
Upward regulation

	Monthly	Maximum	Minimum	Total	Actually	Deviation	C1	C3	C1	C3	HHI	HHI	
	average			selected	delivered	%	Number	(selected)	(actually delivered)	(selected)	(actually delivered)		
Secondary	301.21	550.00	250.00	39360.57	39360.57	0.00%	4	58.22%	99.58%	58.22%	99.58%	4761	4761
Fast Tertiary	293.89	550.00	0.10	80373.46	77325.22	3.79%	11	79.05%	95.38%	81.22%	95.41%	6406	6713
Slow Tertiary	321.72	339.00	210.00	8383.25	8147.06	2.82%	7	78.80%	98.35%	80.08%	98.31%	6406	6589

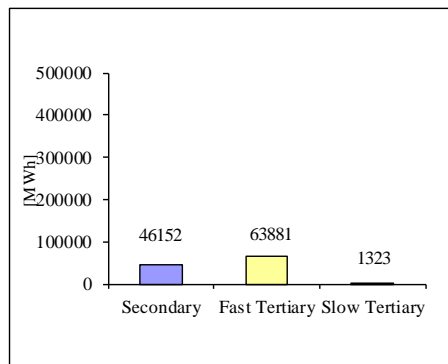
Balancing energy – Selected prices and quantities in September 2017

September 2017

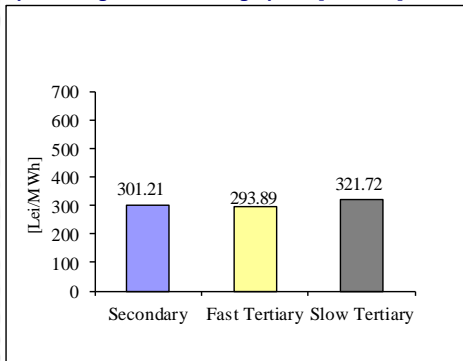
Downward regulation - average price [lei/MWh]



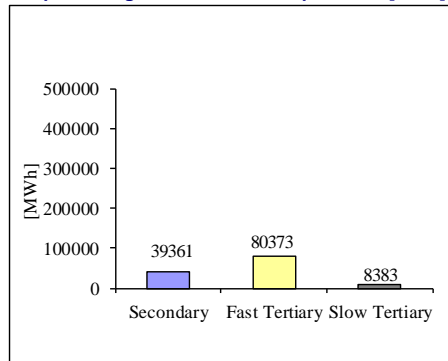
Downward regulation - selected quantities [MWh]



Upward regulation - average price [lei/MWh]



Upward regulation - selected quantities [MWh]



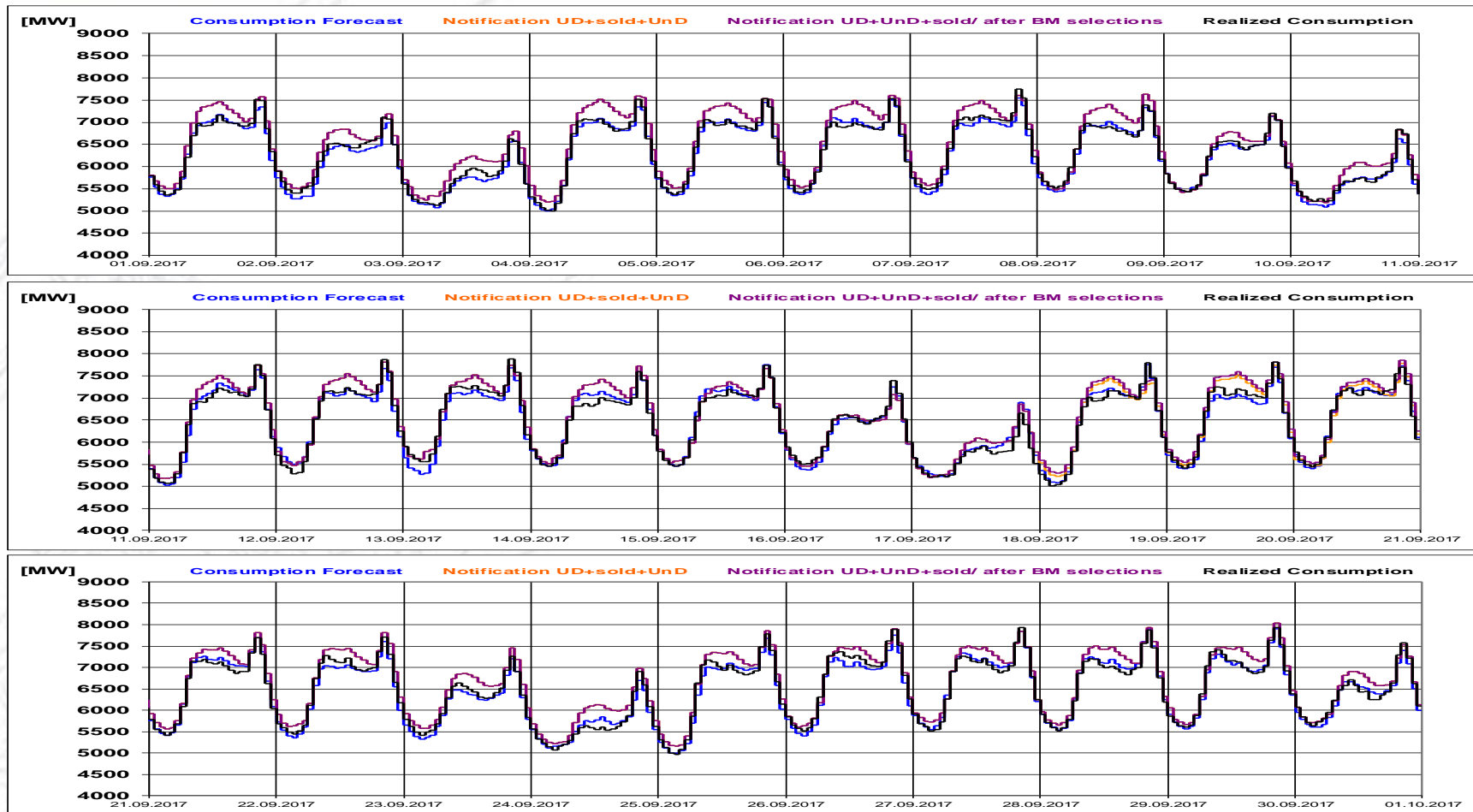


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Realized consumption. forecast. notifications.
notifications after BM selections in D-1



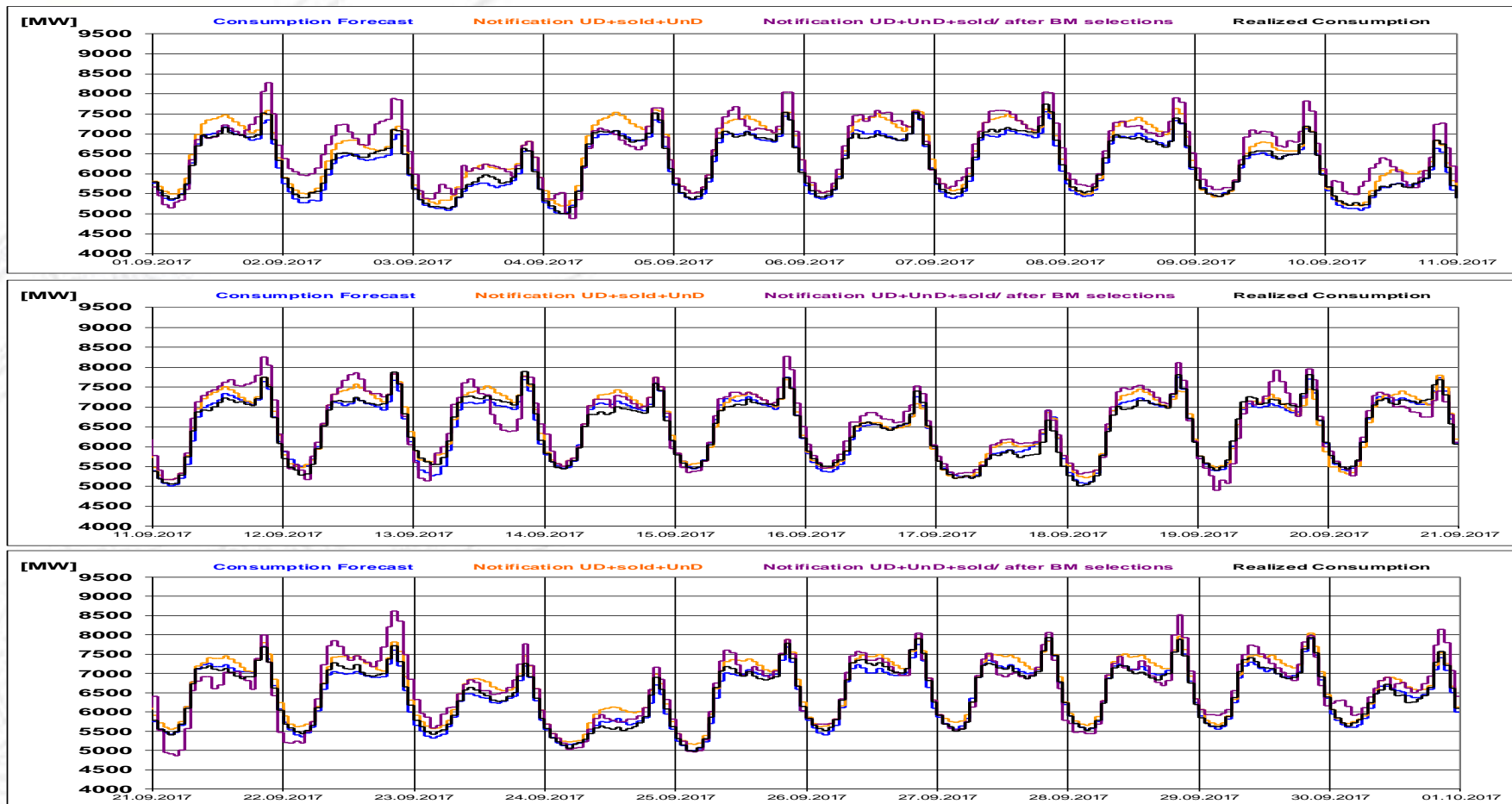


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Balancing Market

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





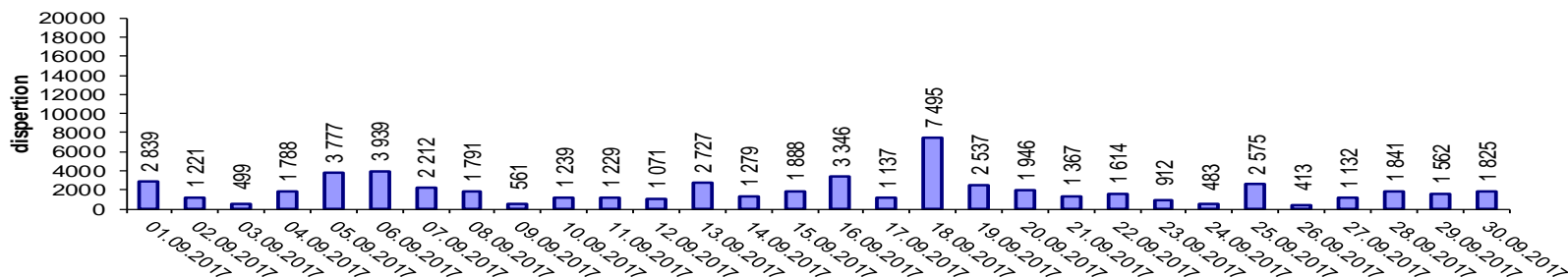
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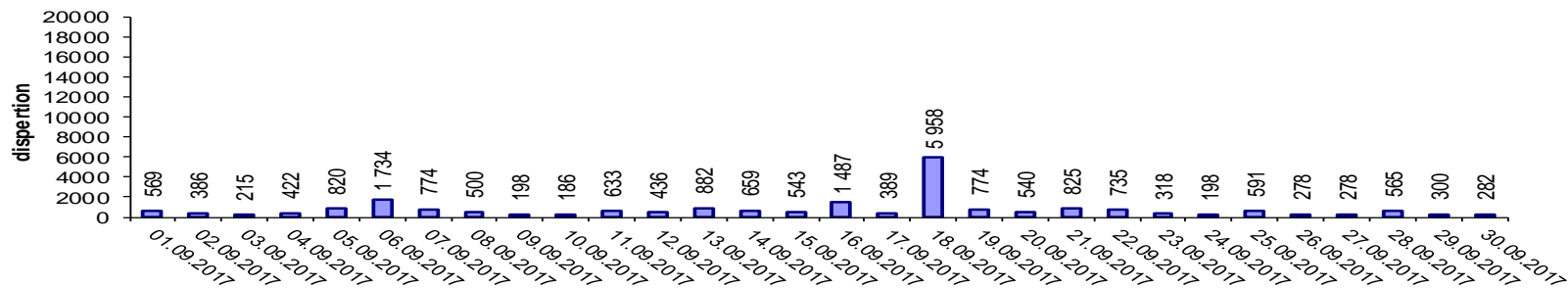
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Indicators – Price Volatility for Secondary Regulation

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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