



Transelectrica®
Societate Administrată în Sistem Dualist

MARKET MONITORING REPORT

Balancing Market

March 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

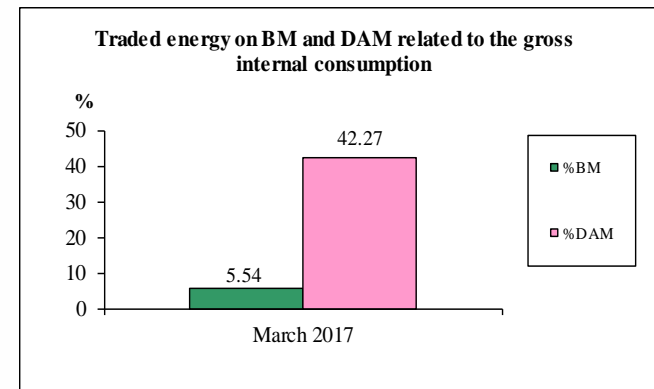
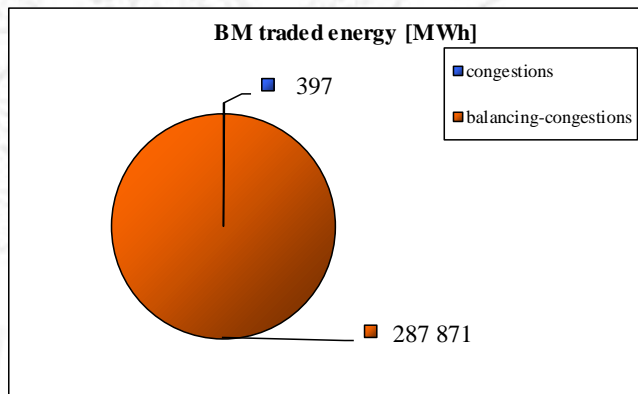


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According to the Commercial Code, Transelectrica, the Romanian Transmission System Operator, operates and monitors the activity of 3 types of markets: Balancing Market, Ancillary Services Market and Market for Allocation of Cross-Border Capacities.

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 average monthly value of generated power was 7 776 MW and the actual internal gross consumption was 7 004 MW.
- The NDC consumption forecast was close to the actual consumption. the standard deviation being 1,63 %. 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 4,10 %. The greatest daily deviation. regarding the notifications. was registered in 5.03 (7,01 %).
- The energy used in March 2017 for balancing the power system and congestion management was 288 268 MWh (with an average power of 388 MW, which means **5,54** % from the internal gross consumption).
 - the energy used for congestion management was 397 MWh (with an average power of 0,53 MW, which means 0,008 % from the internal gross consumption).
- The energy traded in March 2017 on Day Ahead Market was 2 199 783 MWh (with an average power of 2 961 MW, which means **42,27** % from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 29 468 163 lei (with an average weighted price of 102 lei/MWh).
 - the cost of the energy paid by C.N.T.E.E. Transelectrica S.A. for congestion management was 39 746 lei (with an average weighted price of 100 lei/MWh), which means 0,13 % from the total cost.





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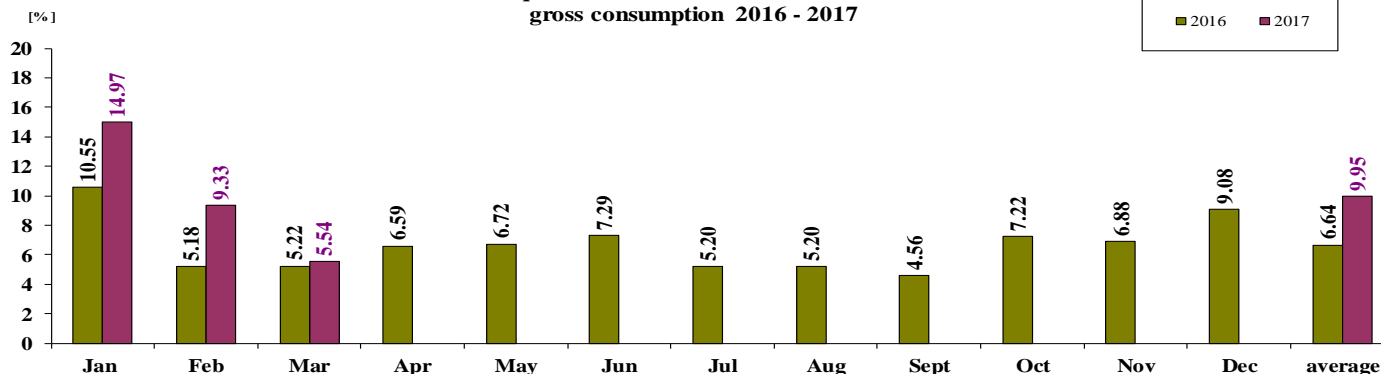
Balancing Market

The Balance Generation / Consumption

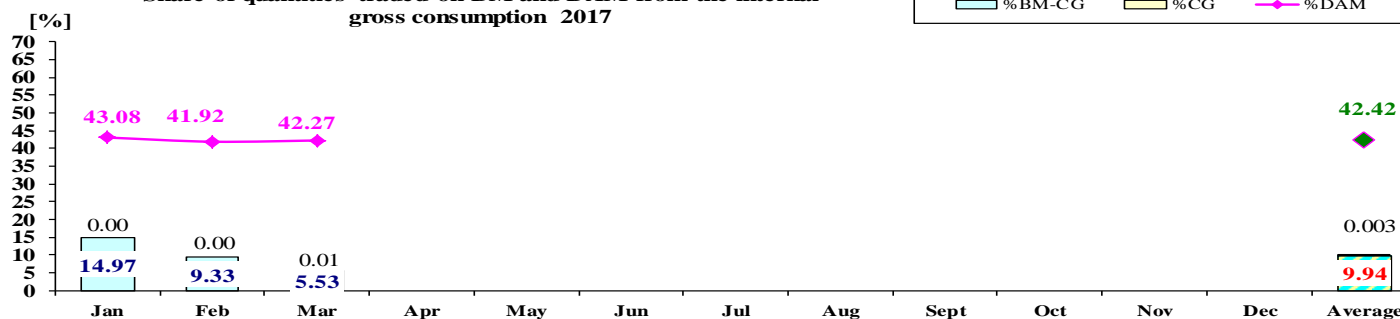
• Monthly percentage values resulted are calculated as ratio between traded volumes on BM and gross internal consumption.

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



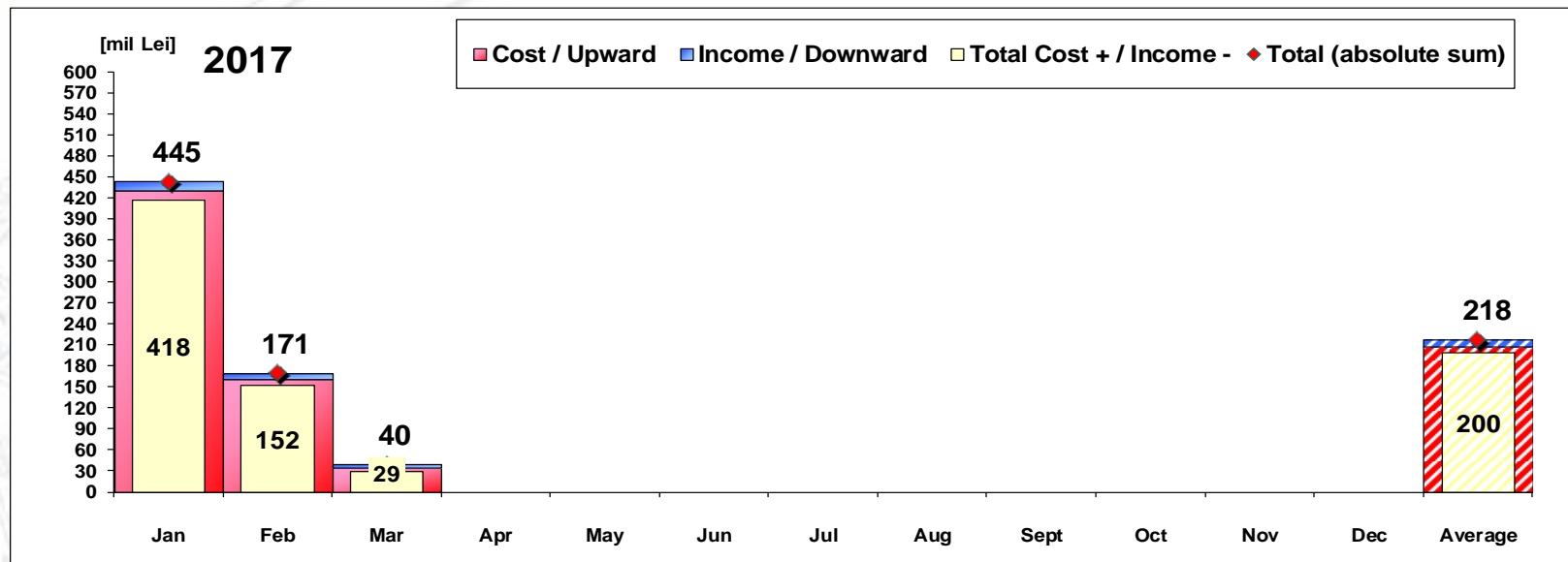
	2017												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Average
%BM	14.97	9.33	5.54										9.95
%DAM	43.08	41.92	42.27										42.42
%CG	0.00	0.00	0.01										0.003
%BM-CG	14.97	9.33	5.53										9.94



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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										209 025 476	627 076 427
Income / Downward	13 186 568	9 389 350	5 081 592										9 219 170	27 657 510
CE Cost	0	0	39 746										13 249	39 746
Total Cost + / Income -	418 206 681	151 744 073	29 468 163										199 806 306	599 418 917
Total (absolute sum)	444 579 817	170 522 773	39 631 347										218 244 646	654 733 937

CE – Congestion Energy

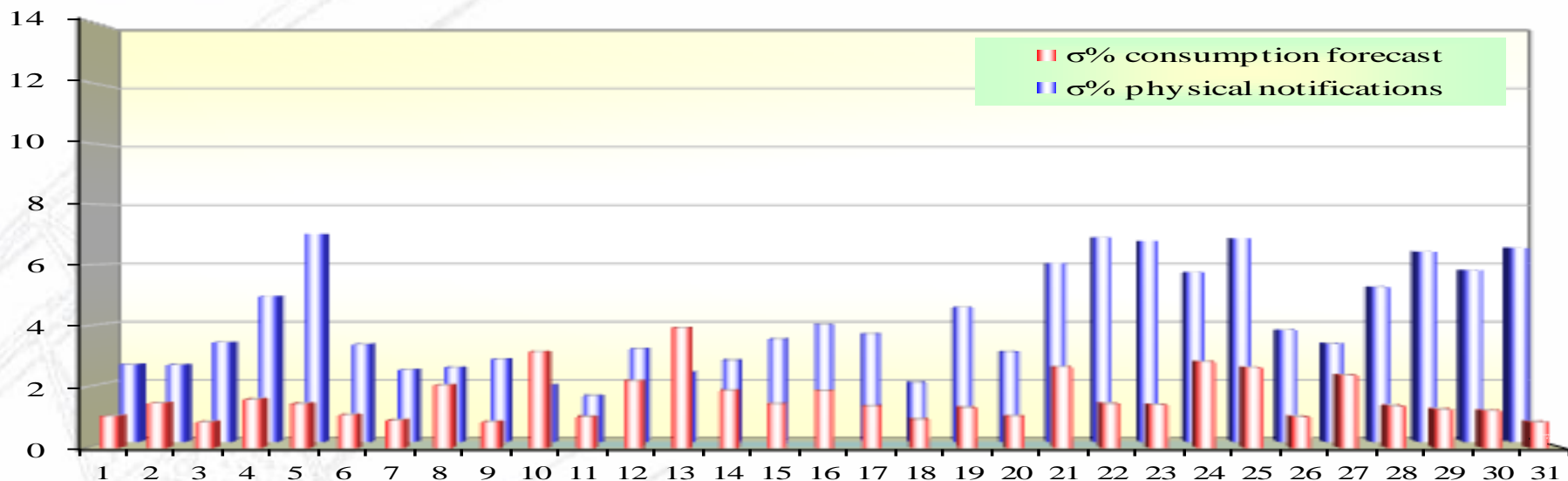
* The average annual value of BM transactions (the absolute sum of upward and downward transactions) was calculated as average of monthly values.



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



March 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	1.04	1.46	0.84	1.59	1.44	1.08	0.90	2.05	0.85	3.15	1.01	2.19	3.94	1.88	1.44	1.87	1.37	0.93	1.31	1.04	2.65	1.44	1.41	2.82	2.63	1.01	2.38	1.37	1.26	1.22	0.84
σ% physical notifications	2.61	2.60	3.36	4.91	7.01	3.28	2.43	2.50	2.79	1.91	1.56	3.14	2.34	2.75	3.47	3.95	3.64	2.00	4.54	3.03	6.02	6.90	6.77	5.72	6.87	3.77	3.32	5.23	6.42	5.80	6.55

σ_{average}% consumption forecast = 1.63

σ_{average} % physical notifications = 4.10

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

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

Public

R = Realized Consumption;

N = Physical Notifications;

P = Consumption Forecast.

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Balancing energy – Selected prices and quantities

March 2017

Downward regulation

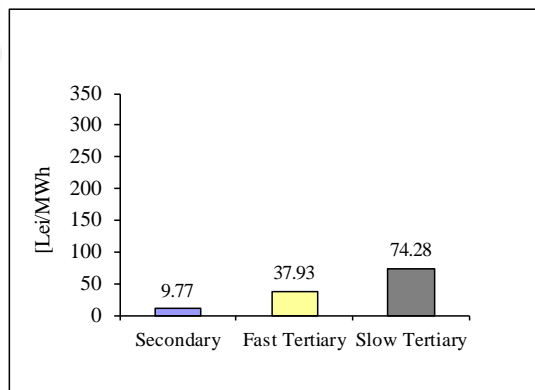
	Prices [lei/MWh]			Quantities [MWh]			Participants					
	Monthly	Maximum	Minimum	Total	Actually	Deviation	C1	C3	C1	C3	HHI	HHI
	average			selected	delivered	%	Number	(selected)	(actually delivered)	(selected)		(actually delivered)
Secondary	9.77	100.00	0.10	59098.49	59098.49	0.00%	5	59.54%	97.04%	59.54%	4725	4725
Fast Tertiary	37.93	300.00	0.10	101011.31	93378.08	7.56%	9	36.95%	97.75%	39.26%	3240	3294
Slow Tertiary	74.28	267.00	0.20	14634.17	12736.94	12.96%	6	68.46%	87.24%	77.80%	4924	6184
				174743.97	165213.51	5.45%						

Upward regulation

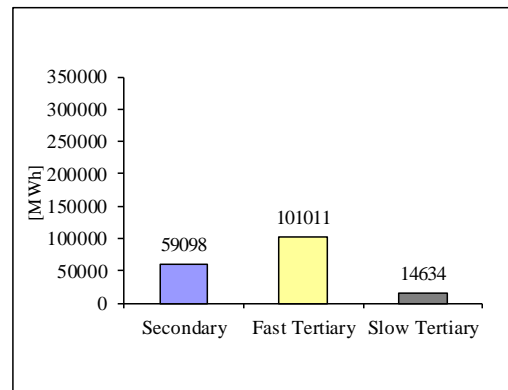
	Prices [lei/MWh]			Quantities [MWh]			Participants					
	Monthly	Maximum	Minimum	Total	Actually	Deviation	C1	C3	C1	C3	HHI	HHI
	average			selected	delivered	%	Number	(selected)	(actually delivered)	(selected)		(actually delivered)
Secondary	304.54	400.00	250.00	35992.99	35992.99	0.00%	5	58.43%	97.27%	58.43%	4694	4694
Fast Tertiary	268.59	400.00	0.10	82756.20	81090.70	2.01%	13	81.10%	94.79%	82.05%	6680	6827
Slow Tertiary	275.57	280.00	100.00	6037.65	5971.21	1.10%	5	91.69%	99.90%	91.81%	8456	8476

Balancing energy – Selected prices and quantities in March 2017

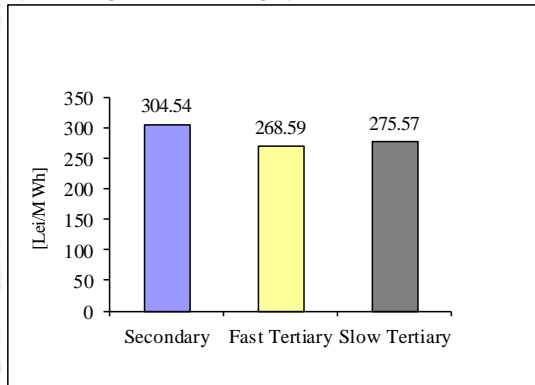
Downward regulation - average price [lei/MWh]



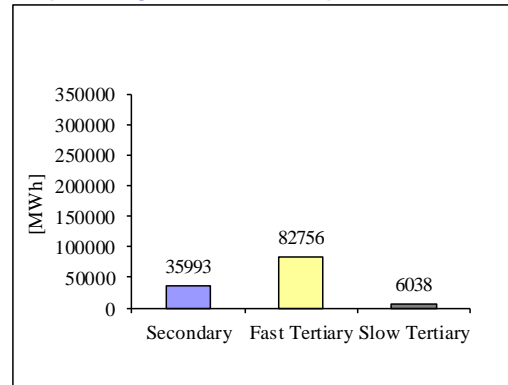
Downward regulation - selected quantities [MWh]



Upward regulation - average price [lei/MWh]



Upward regulation - selected quantities [MWh]



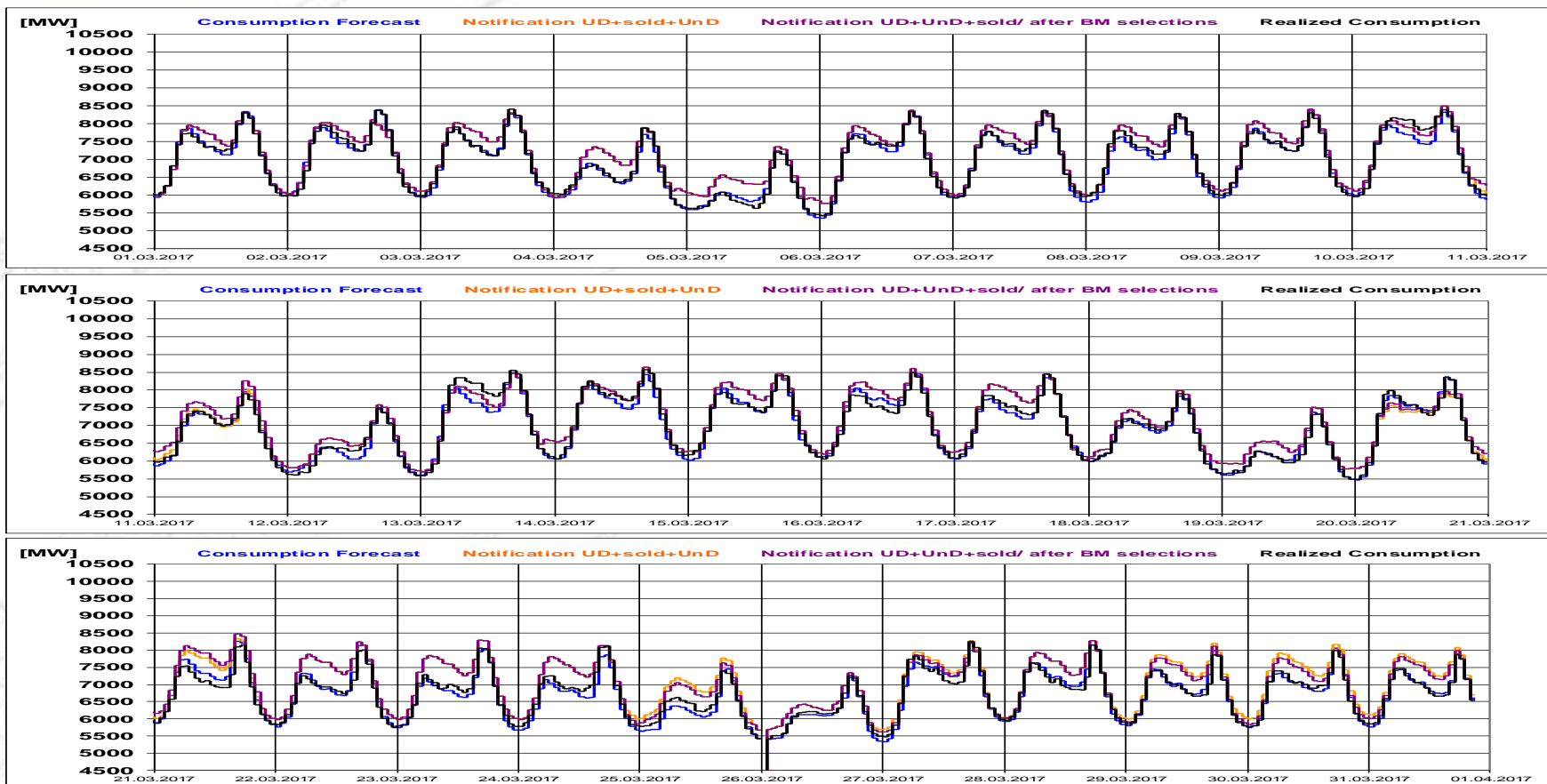


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Realized consumption. forecast. notifications.
notifications after BM selections in D-1



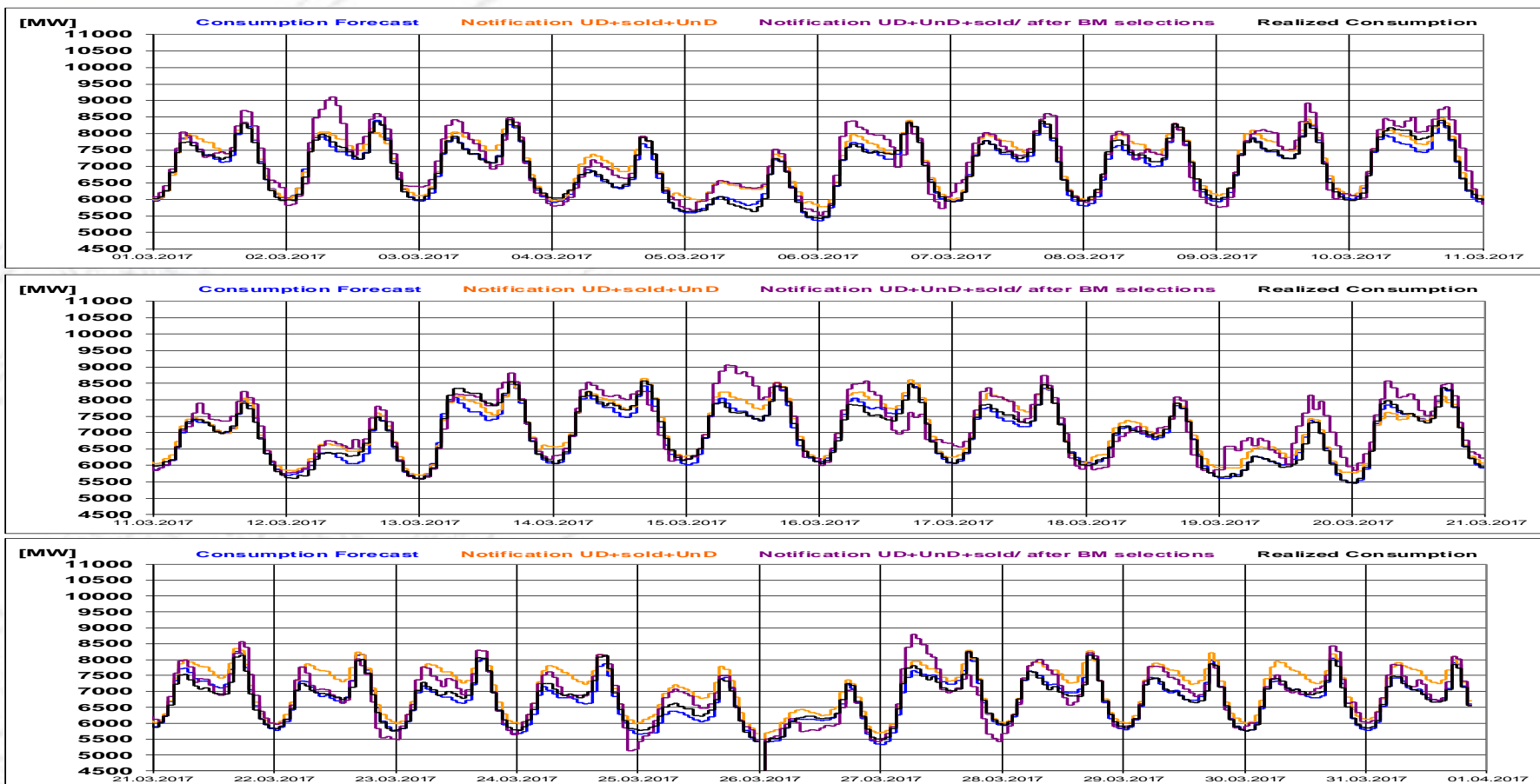


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Balancing Market

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



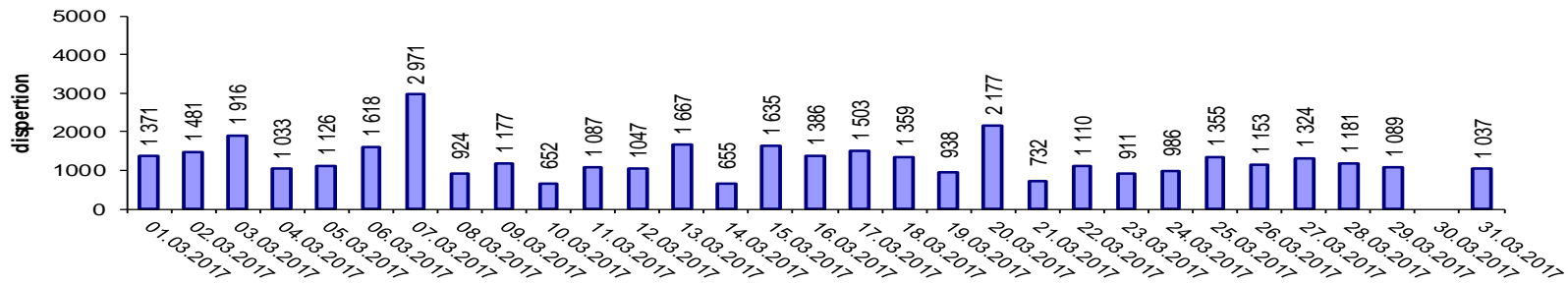


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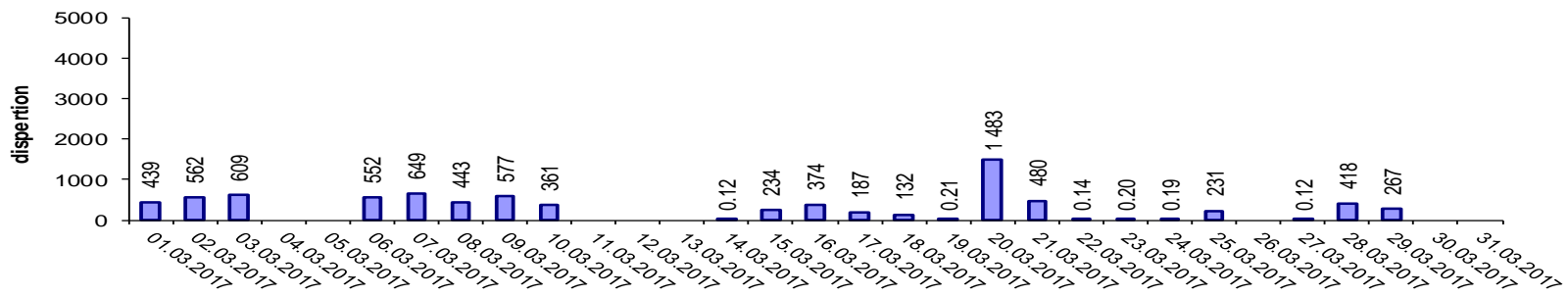
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Indicators – Price Volatility for Secondary Regulation

Price Volatility for Secondary Upward Regulation



Price Volatility for Secondary Downward Regulation

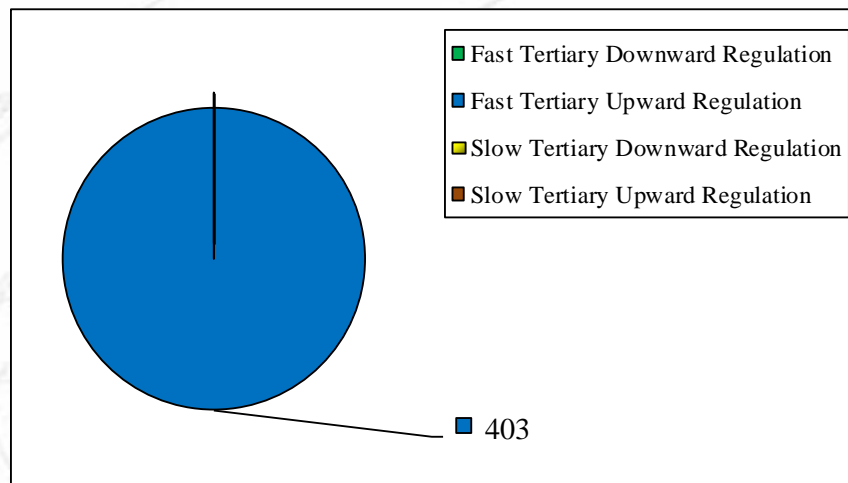


Volatility = price dispersion on studied interval:

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

Public

	Quantities [MWh]			Participants
	<i>Selected</i>	<i>Delivered</i>	<i>Deviation[%]</i>	<i>Number</i>
Fast Tertiary Downward Regulation	-	-	-	-
Fast Tertiary Upward Regulation	402.50	397.48	1.25%	2
Slow Tertiary Downward Regulation	-	-	-	-
Slow Tertiary Upward Regulation	-	-	-	-
	402.50	397.48	1.25%	2



Note: The value of delivered energy for congestion management is the result of the algorithm used to determine the costs for balancing the power system and internal congestion management.



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