



Transelectrica®
Societate Administrată în Sistem Dualist

MARKET MONITORING REPORT

Balancing Market

July 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).



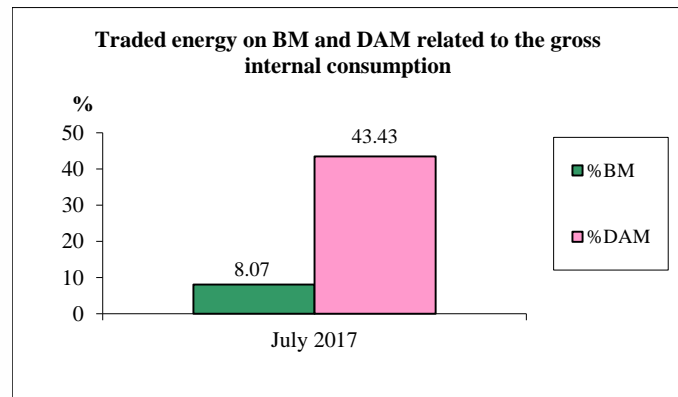
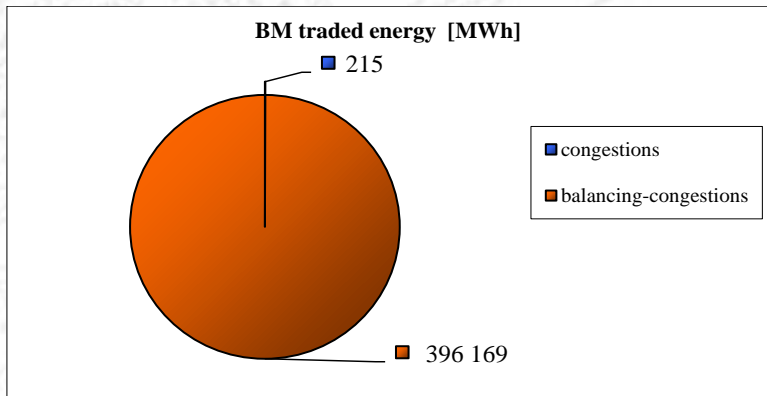
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The Balance Generation/Consumption

- The average monthly value of generated power was 6 698 MW and the actual internal gross consumption was 6 605 MW.
- The NDC consumption forecast was close to the actual consumption. the standard deviation being **1.93 %**. 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 **3.78% %**. The greatest daily deviation. regarding the notifications. was registered in **21.07 (8,24 %)**.
- The energy used in July 2017 for balancing the power system and congestion management was 396 385 MWh (with an average power of 533 MW, which means **8,07 %** from the internal gross consumption).
 - the energy used for congestion management was 215 MWh (with an average power of 0.29 MW, which means 0.004 % from the internal gross consumption).
- The energy traded in July 2017 on Day Ahead Market was 2 134 204 MWh (with an average power of 2 869 MW, which means **43,43 %** from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 105 459 987 lei (with an average weighted price of 266 lei/MWh).
 - the cost of the energy paid by C.N.T.E.E. Transelectrica S.A. for congestion management was 52 284 lei (with an average weighted price of 243 lei/MWh), which means 0,05% from the total cost.





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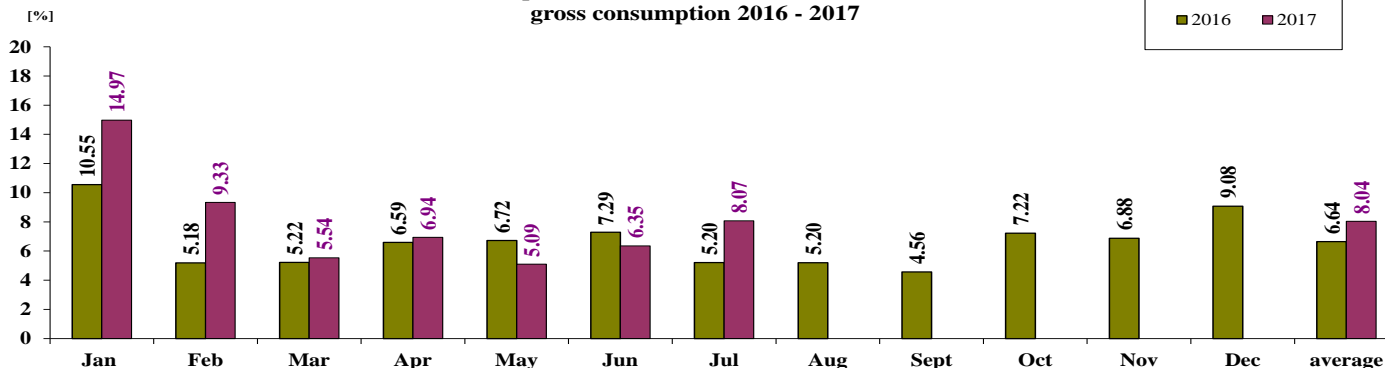
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The Balance Generation / Consumption

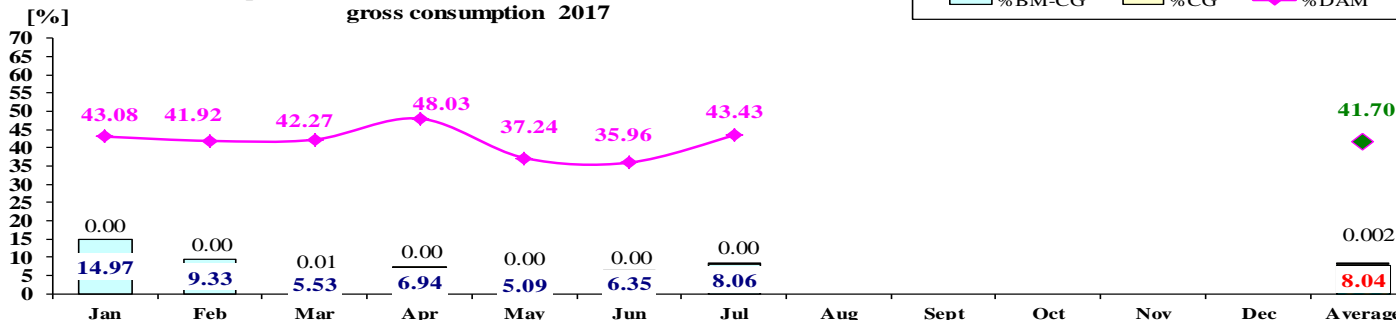
• Monthly percentage values resulted are calculated as ratio between traded volumes on BM and gross internal consumption.

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).

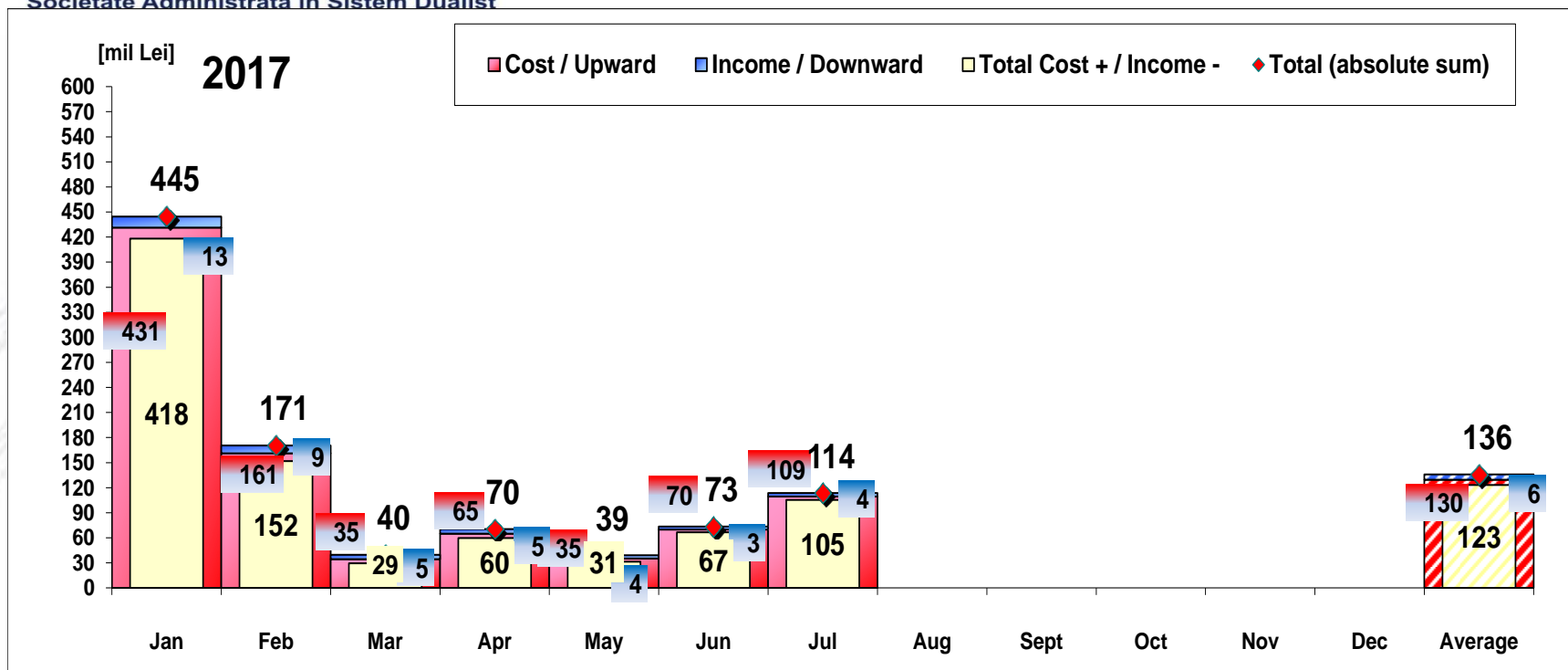
Share of quantities traded on BM from the internal gross consumption 2016 - 2017



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						8.04
%DAM	43.08	41.92	42.27	48.03	37.24	35.96	43.43						41.70
%CG	0.00	0.00	0.01	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						8.04



[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						129 555 627	906 889 391
Income / Downward	13 186 568	9 389 350	5 081 592	5 304 021	3 844 149	3 382 836	4 036 941						6 317 922	44 225 456
CE Cost	0	0	39 746	1 614	0	0	52 284						13 378	93 643
Total Cost + /	418 206 681	151 744 073	29 468 163	59 697 647	31 465 033	66 622 351	105 459 987						123 237 705	862 663 935
Total (absolute sum)	444 579 817	170 522 773	39 631 347	70 305 689	39 153 331	73 388 022	113 533 869						135 873 550	951 114 848

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.

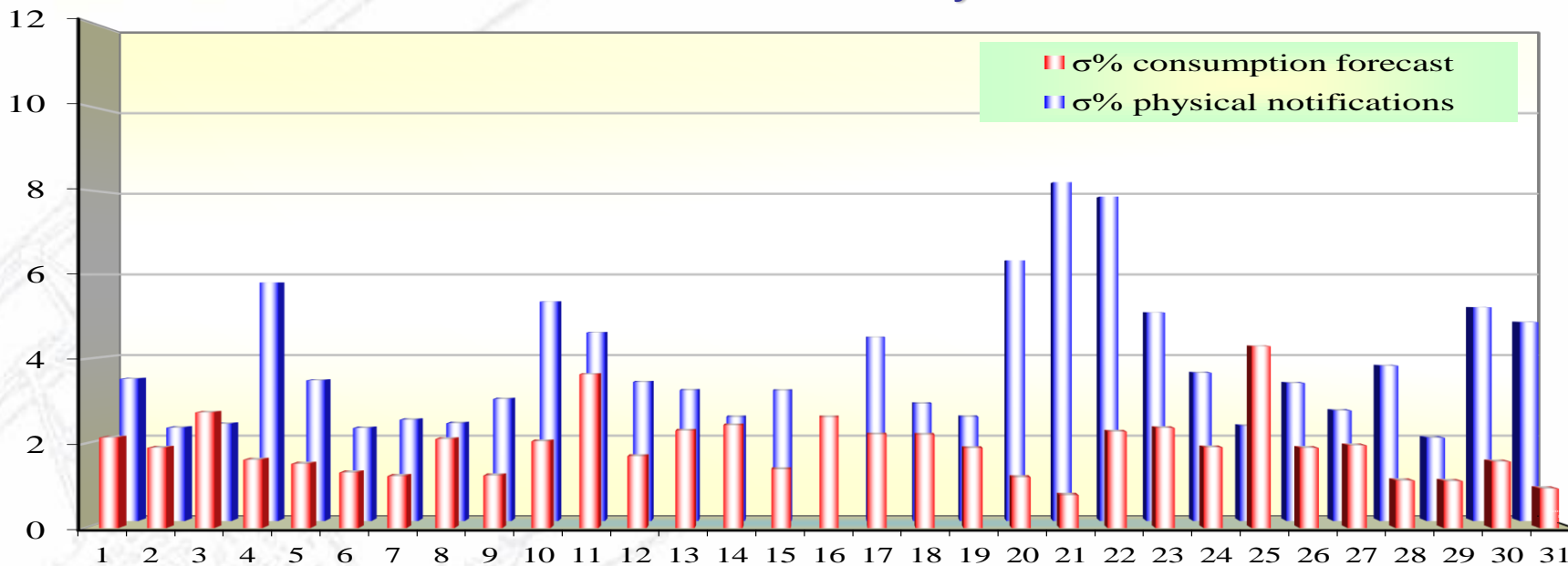


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Standard deviation of physical notifications and consumption forecast against the actual consumption in July 2017



July 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	2.14	1.90	2.74	1.61	1.52	1.31	1.23	2.10	1.24	2.05	3.64	1.70	2.31	2.43	1.39	2.62	2.22	2.21	1.89	1.20	0.78	2.28	2.37	1.91	4.30	1.90	1.96	1.12	1.11	1.57	0.93
σ% physical notifications	3.46	2.27	2.36	5.80	3.42	2.26	2.46	2.38	2.97	5.34	4.59	3.38	3.18	2.53	3.17	2.46	4.47	2.86	2.53	6.34	8.24	7.89	5.07	3.60	2.31	3.36	2.69	3.78	2.02	5.20	4.84

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

R = Realized Consumption;

N = Physical Notifications;

P = Consumption Forecast.

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

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σ_{average} % consumption forecast = 1.93

σ_{average} % physical notifications = 3.78



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Balancing Market

Balancing energy – Selected prices and quantities

- At the beginning of the month on the Balancing Market operated 90 BRPs, 124 market participants, holding 239 commercially operating dispatchable units. After the end of trial period and starting with 15th of July 2017, photovoltaic production unit VALCALUG1 (30W-VALCALUG---F) was registered as dispatchable unit and BRP PRE VIR COMPANY INTERNATIONAL (30XROVIRCOMIN--U) registered as temporary BRP according to NRA Order no 59/2015 was removed from BRP list.

July 2017

Downward regulation

	Prices [lei/MWh]		
	Monthly	Maximum	Minimum
average			
Secondary	40.64	150.00	0.10
Fast Tertiary	45.87	270.00	0.10
Slow Tertiary	16.78	50.50	0.20

	Quantities [MWh]		
	Total	Actually	Deviation
selected	delivered	%	
47783.39	47783.39	0.00%	
51045.36	45534.64	10.80%	
740.25	706.36	4.58%	
99568.99	94024.38	5.57%	

	Participants					
	C1	C3	C1	C3	HHI	HHI
Number	(selected)	(actually delivered)	(selected)	(actually delivered)		
4	57.34%	99.61%	57.34%	99.61%	4825	4825
6	39.95%	99.77%	39.14%	99.96%	3580	3522
2	58.80%	100.00%	57.15%	100.00%	5155	5102

Upward regulation

	Monthly	Maximum	Minimum
average			
Secondary	337.29	500.00	250.00
Fast Tertiary	318.20	500.00	0.10
Slow Tertiary	425.98	737.00	89.00

	Total	Actually	Deviation
selected	delivered	%	
44403.19	44403.19	0.00%	
160066.50	155130.02	3.08%	
104828.62	102826.97	1.91%	
309298.31	302360.17	2.24%	

	C1	C3	C1	C3	HHI	HHI
Number	(selected)	(actually delivered)	(selected)	(actually delivered)		
4	55.98%	99.63%	55.98%	99.63%	4668	4668
11	85.99%	95.77%	87.66%	96.09%	7453	7729
8	57.95%	98.32%	57.96%	98.30%	4786	4799



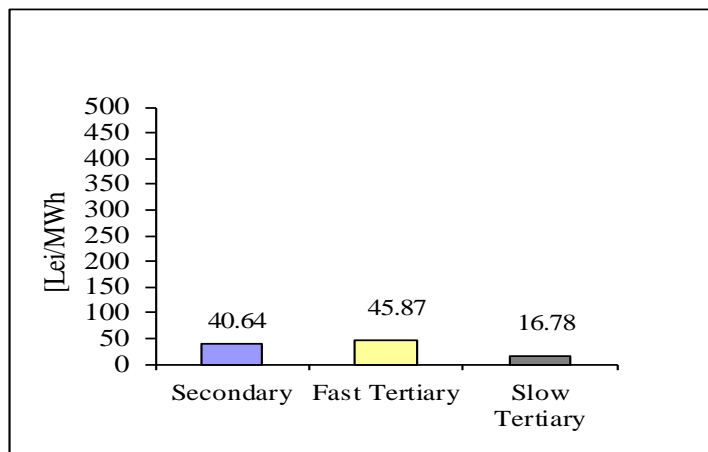
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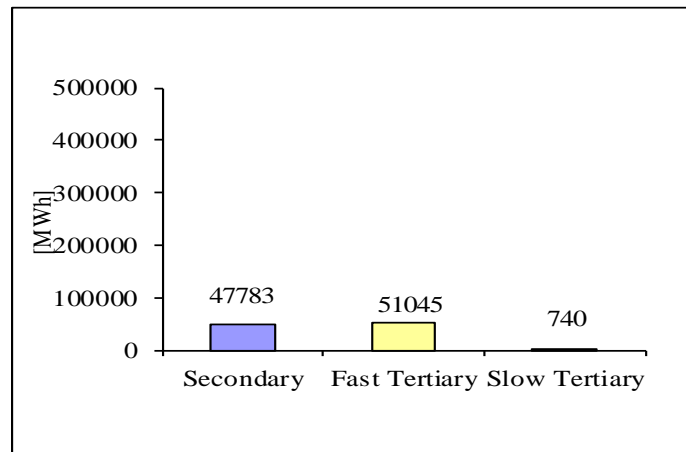
Balancing Market

Balancing energy – Selected prices and quantities in July 2017

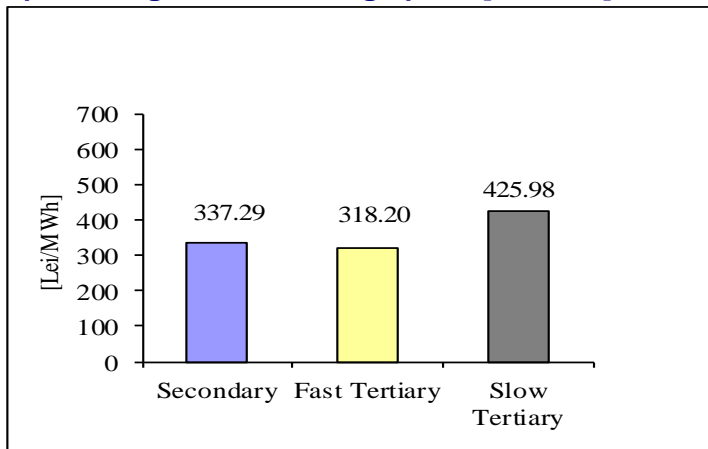
Downward regulation - average price [lei/MWh]



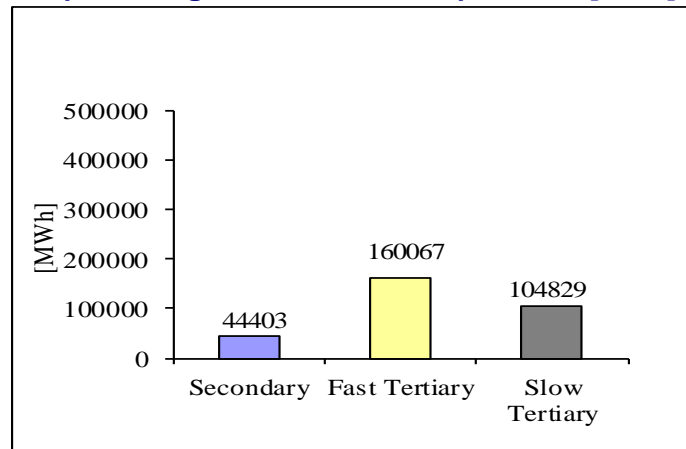
Downward regulation - selected quantities [MWh]



Upward regulation - average price [lei/MWh]



Upward regulation - selected quantities [MWh]



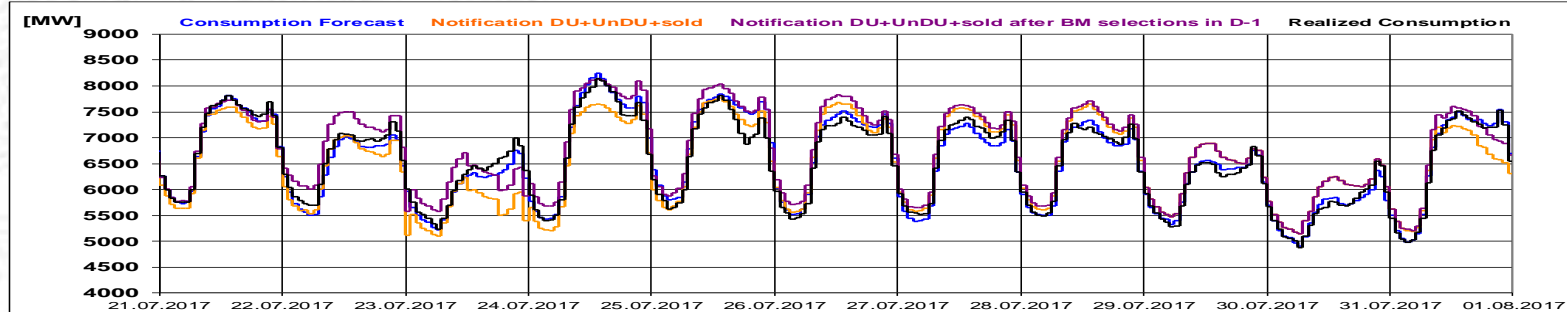
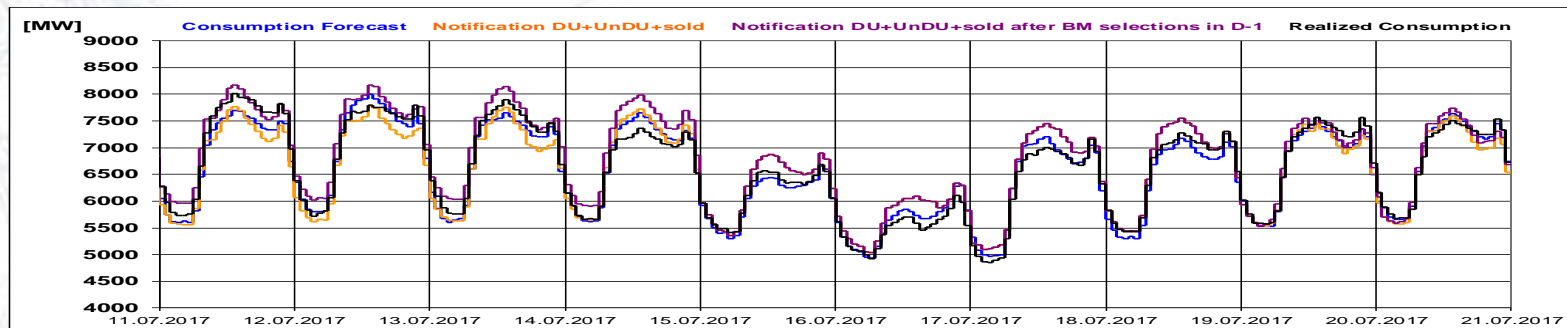
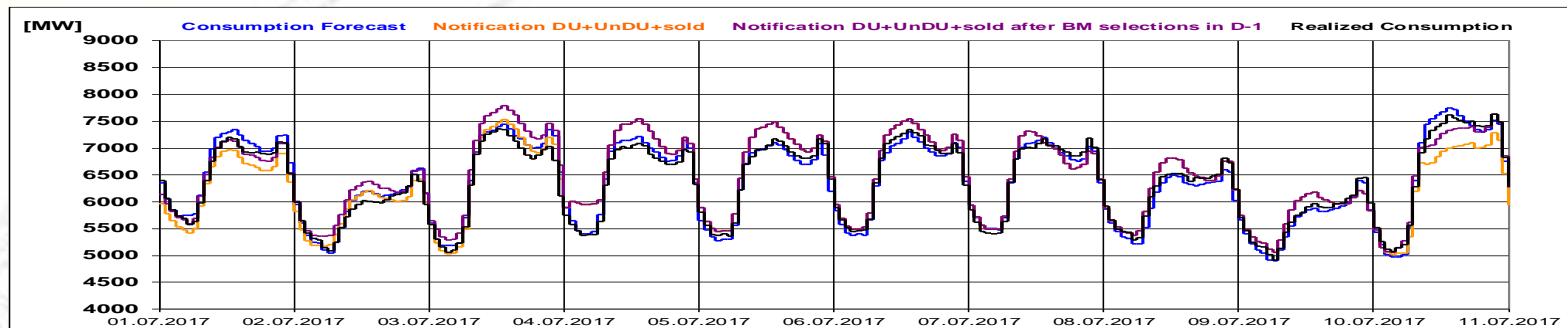


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Realized consumption. forecast. notifications.
notifications after BM selections in D-1



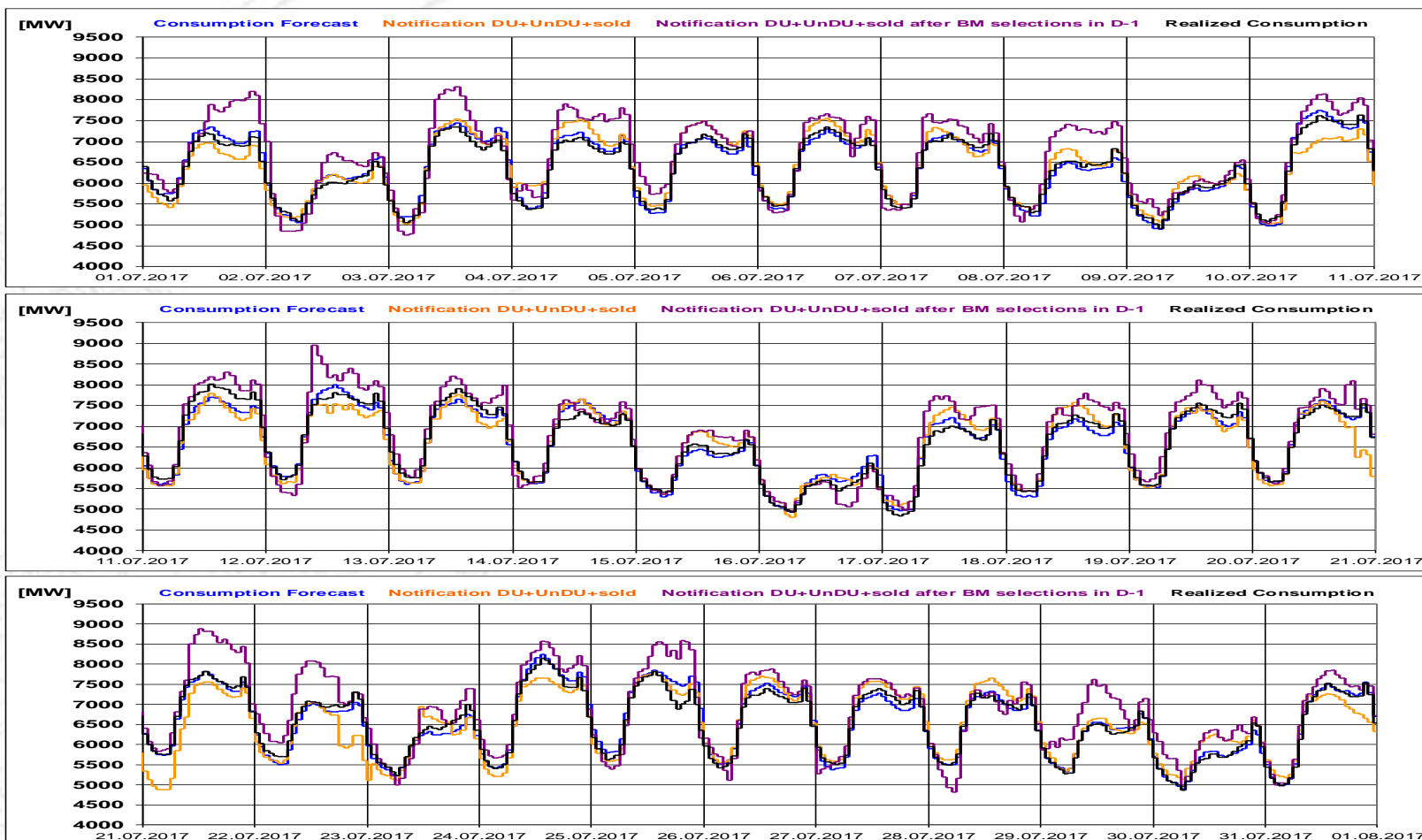


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Balancing Market

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



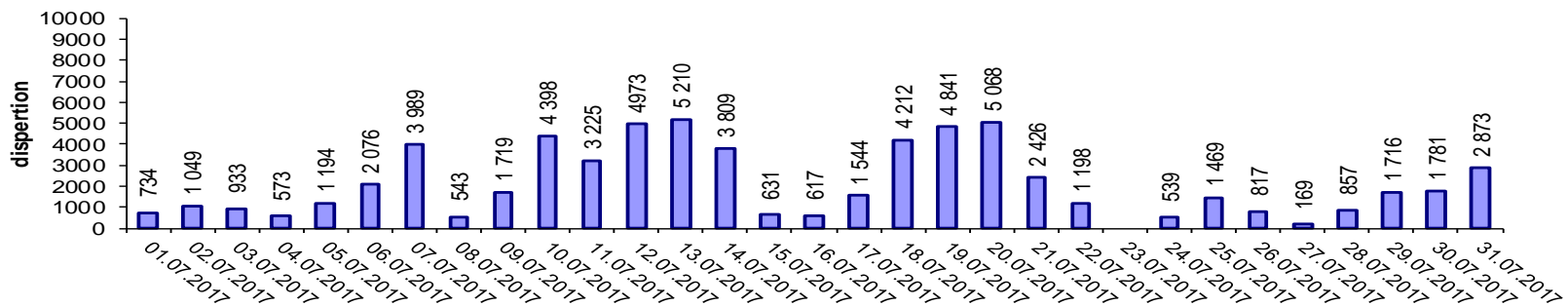


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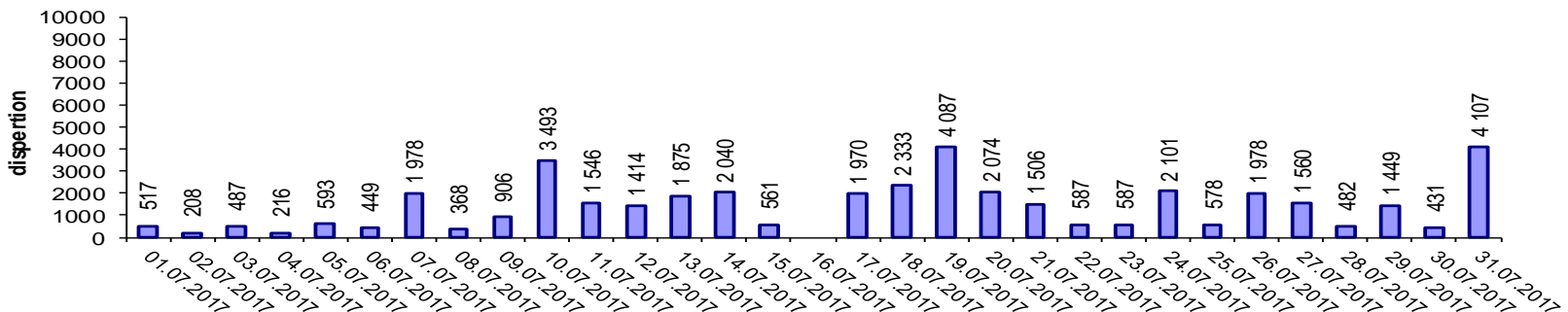
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Indicators – Price Volatility for Secondary Regulation

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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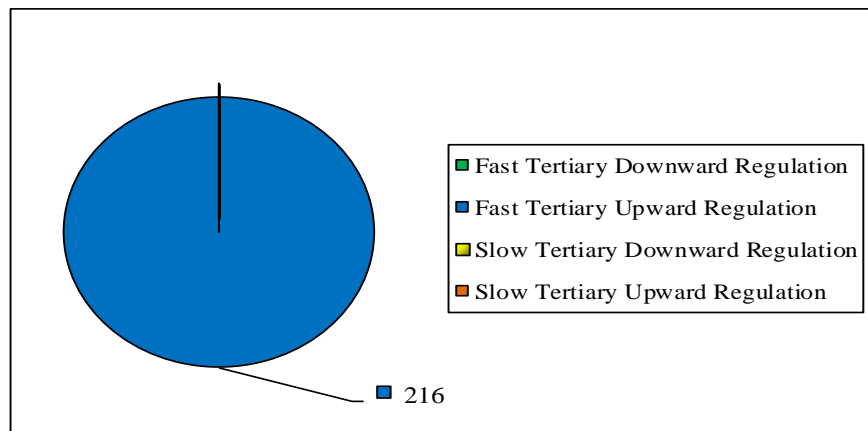
Congestion Management



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	Quantities [MWh]			Participants
	Selected	Delivered	Deviation[%]	Number
Fast Tertiary Downward Regulation	-	-	0.00%	-
Fast Tertiary Upward Regulation	216.00	215.47	0.24%	1
Slow Tertiary Downward Regulation	-	-	0.00%	-
Slow Tertiary Upward Regulation	-	-	0.00%	-
	216.00	215.47	0.24%	

Selected energy [MWh]



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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