

# MARKET MONITORING REPORT

## Balancing Market

February 2018

## Abbrevations

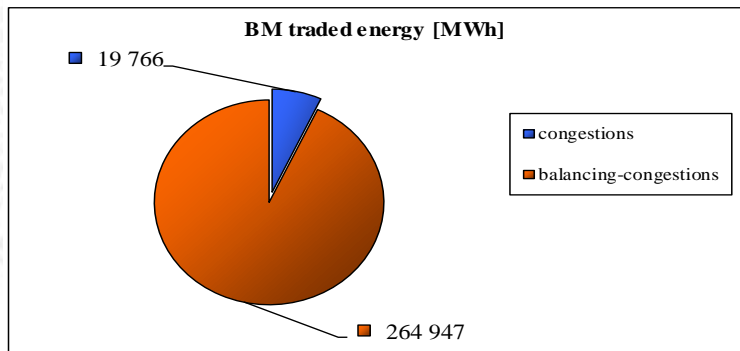
ANRE - Romanian Energy Regulatory Authority  
HHI - Herfindahl-Hirschman Index  
BRP - Balance Responsible Party  
BM - Balancing Market  
DAM - Day Ahead Market  
TSO - Transmission System Operator  
DU – Dispatchable Unit  
PN – Physical Notification  
NDC - National Dispatching Center  
C1 – The market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

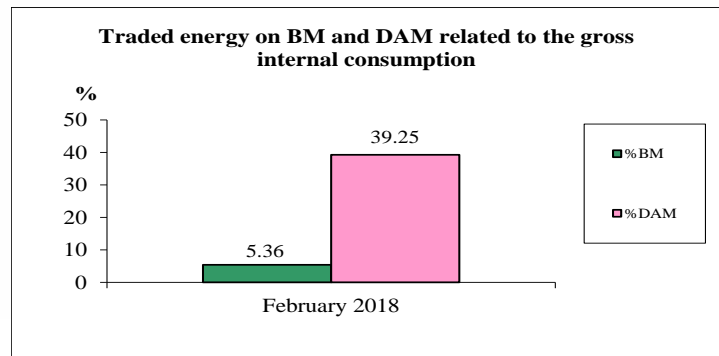
Using the records from the markets data bases, Transelectrica prepares daily, weekly and monthly monitoring reports. A part of the data included in these reports (those data which are not confidential) are published on the website **[www.transelectrica.ro](http://www.transelectrica.ro)** (section Transparency).

## The Balance Generation/Consumption

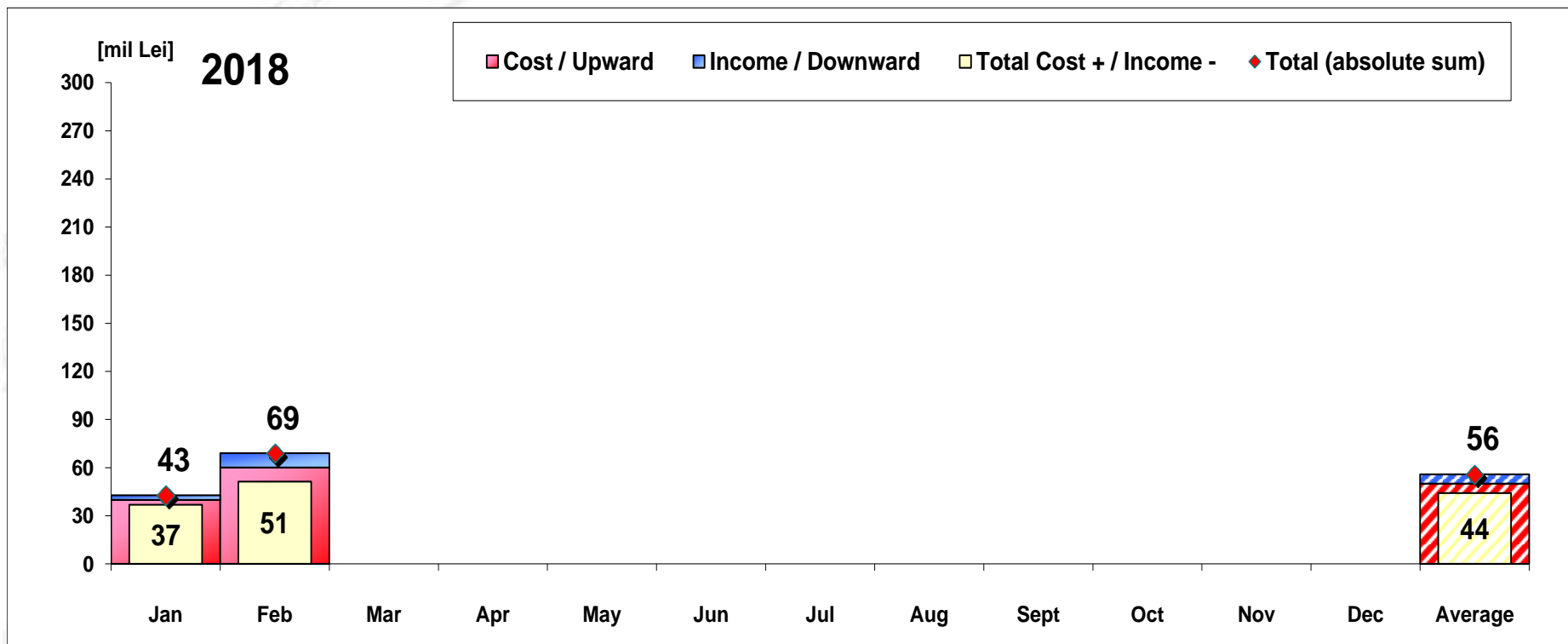
- The average monthly value of generated power was 8 663 MW and the actual internal gross consumption was 7 905 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being **1.31 %**. Bigger differences were registered in case of consumption values resulted as the sum between notified production and total scheduled exchanges with the neighbouring power systems. In this case the standard monthly deviation value was **1.91 %**. The greatest daily deviation regarding the notifications was registered in **28.02 (5,47 %)**.
- The energy used in February 2018 for balancing the power system and congestion management was 284 713 MWh (with an average power of 424 MW, which means **5,36 %** from the internal gross consumption).
  - the energy used for congestion management was 19 766 MWh (with an average power of 29 MW, which means 0.37 % from the internal gross consumption).
- The energy traded in February 2018 on Day Ahead Market was 2 084 912 MWh (with an average power of 3 103 MW, which means **39,25 %** from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 51 341 283 lei (with an average weighted price of 180 lei/MWh).
  - the cost of the energy paid by C.N.T.E.E. Transelectrica S.A. for congestion management was 5 234 582 lei (with an average weighted price of 265 lei/MWh), which means 10,20% from the total cost.



February 2018





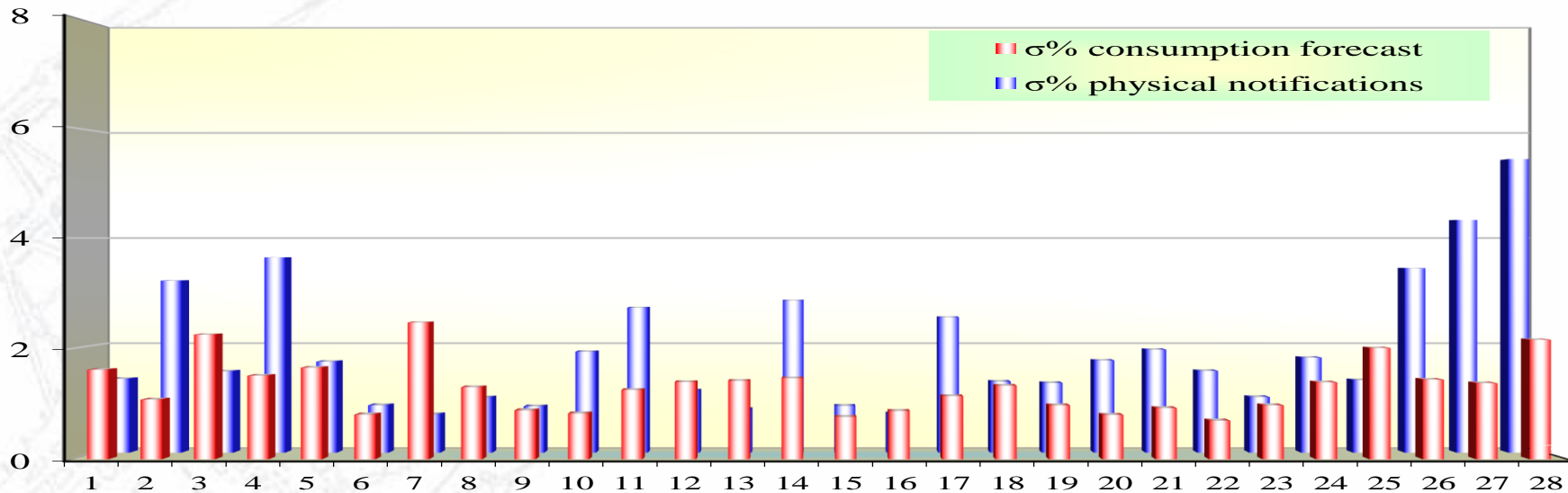


[Lei]	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Average	Total
Cost / Upward	39 819 143	60 149 383											49 984 263	99 968 526
Income / Downward	2 909 103	8 808 101											5 858 602	11 717 204
CE Cost	0	5 234 582											2 617 291	5 234 582
Total Cost + / Income -	36 910 039	51 341 283											44 125 661	88 251 322
Total (absolute sum)	42 728 246	68 957 484											55 842 865	111 685 730

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 February 2018



February 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
σ% consumption forecast	1.62	1.08	2.25	1.51	1.66	0.81	2.47	1.30	0.88	0.83	1.25	1.40	1.42	1.47	0.76	0.87	1.14	1.33	0.97	0.80	0.92	0.70	0.97	1.39	2.01	1.44	1.38	2.16
σ% physical notifications	1.37	3.21	1.51	3.64	1.70	0.88	0.71	1.03	0.86	1.88	2.70	1.16	0.81	2.84	0.87	0.73	2.52	1.32	1.30	1.72	1.92	1.52	1.04	1.77	1.35	3.44	4.34	5.47

σ<sub>average</sub> % consumption forecast = 1.31

σ<sub>average</sub> % physical notifications = 1.91

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

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

**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, 122 market participants, holding 241 commercially operating dispatchable units.

February 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)	(actually delivered)	
Secondary	25.84	200.00	0.10	43571.37	43571.37	0.00%	5	51.39%	97.71%	51.39%	97.71%	4276	4276
Fast Tertiary	43.16	345.00	0.10	63177.06	57640.23	8.76%	51	31.39%	65.44%	29.86%	64.39%	1792	1735
Slow Tertiary	0.93	1.00	0.20	692.00	607.68	12.18%	2	91.04%	100.00%	89.80%	100.00%	8369	8168
				107440.43	101819.28	5.23%							

**Upward regulation**

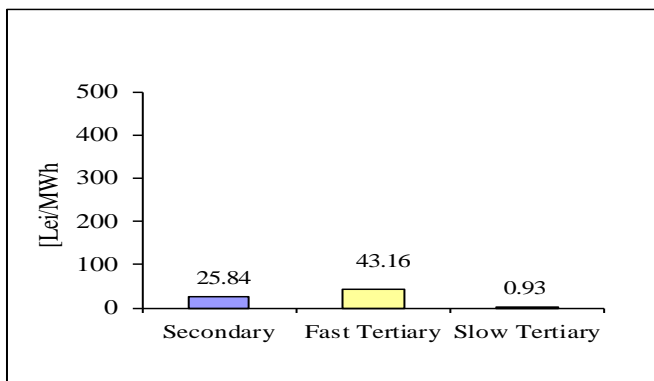
	Monthly	Maximum	Minimum	Total	Actually	Deviation	C1	C3	C1	C3	HHI	HHI	
	average			selected	delivered	%	Number	(selected)	(actually delivered)	(selected)	(actually delivered)	(actually delivered)	
Secondary	306.13	450.00	250.00	38365.29	38365.29	0.00%	5	51.39%	97.62%	51.39%	97.62%	4295	4295
Fast Tertiary	296.50	450.00	0.10	136926.83	132186.39	3.46%	12	72.43%	87.31%	74.28%	87.76%	5392	5637
Slow Tertiary	296.82	399.00	0.10	13054.40	12342.15	5.46%	9	93.11%	98.21%	92.80%	98.18%	8688	8630
				188346.53	182893.84	2.90%							



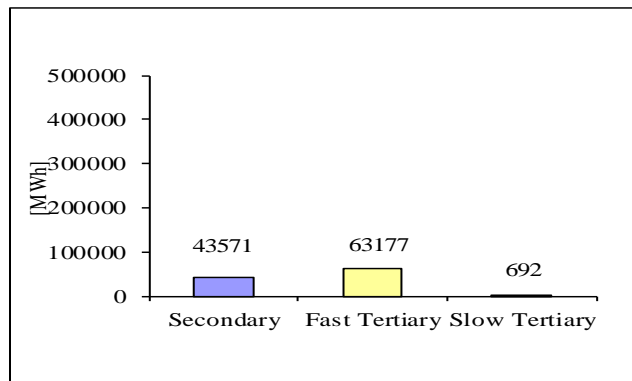
## Balancing energy – Selected prices and quantities in February 2018

February 2018

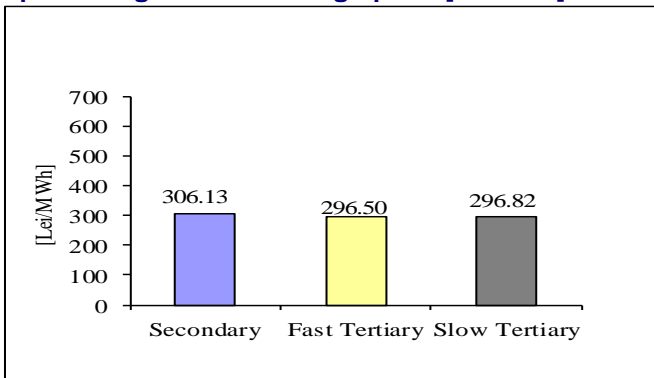
**Downward regulation - average price [lei/MWh]**



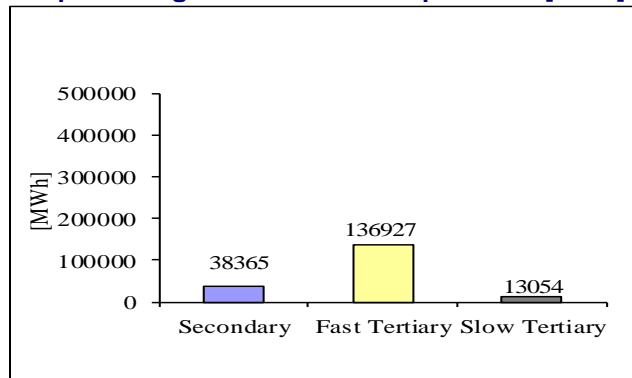
**Downward regulation - selected quantities [MWh]**



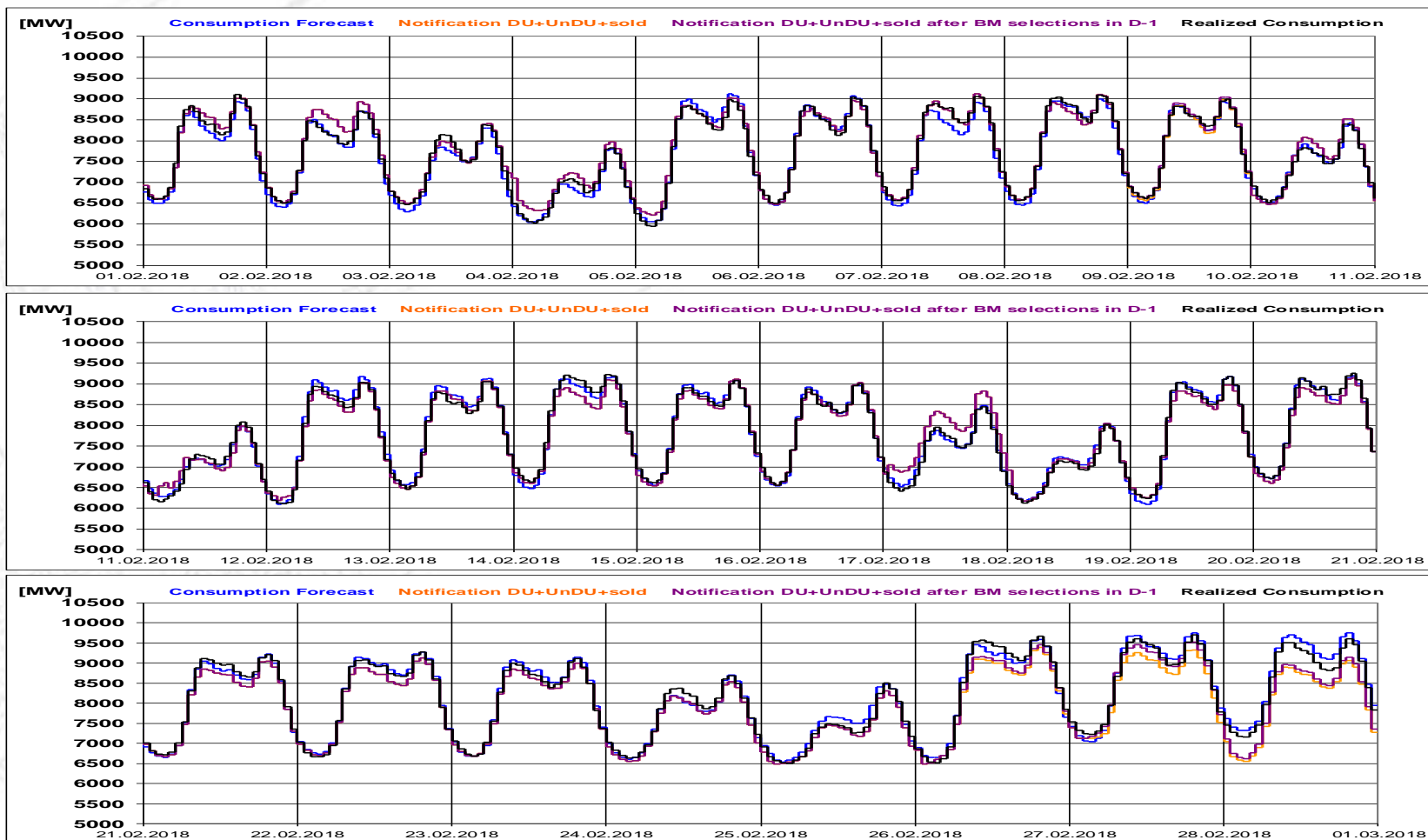
**Upward regulation - average price [lei/MWh]**



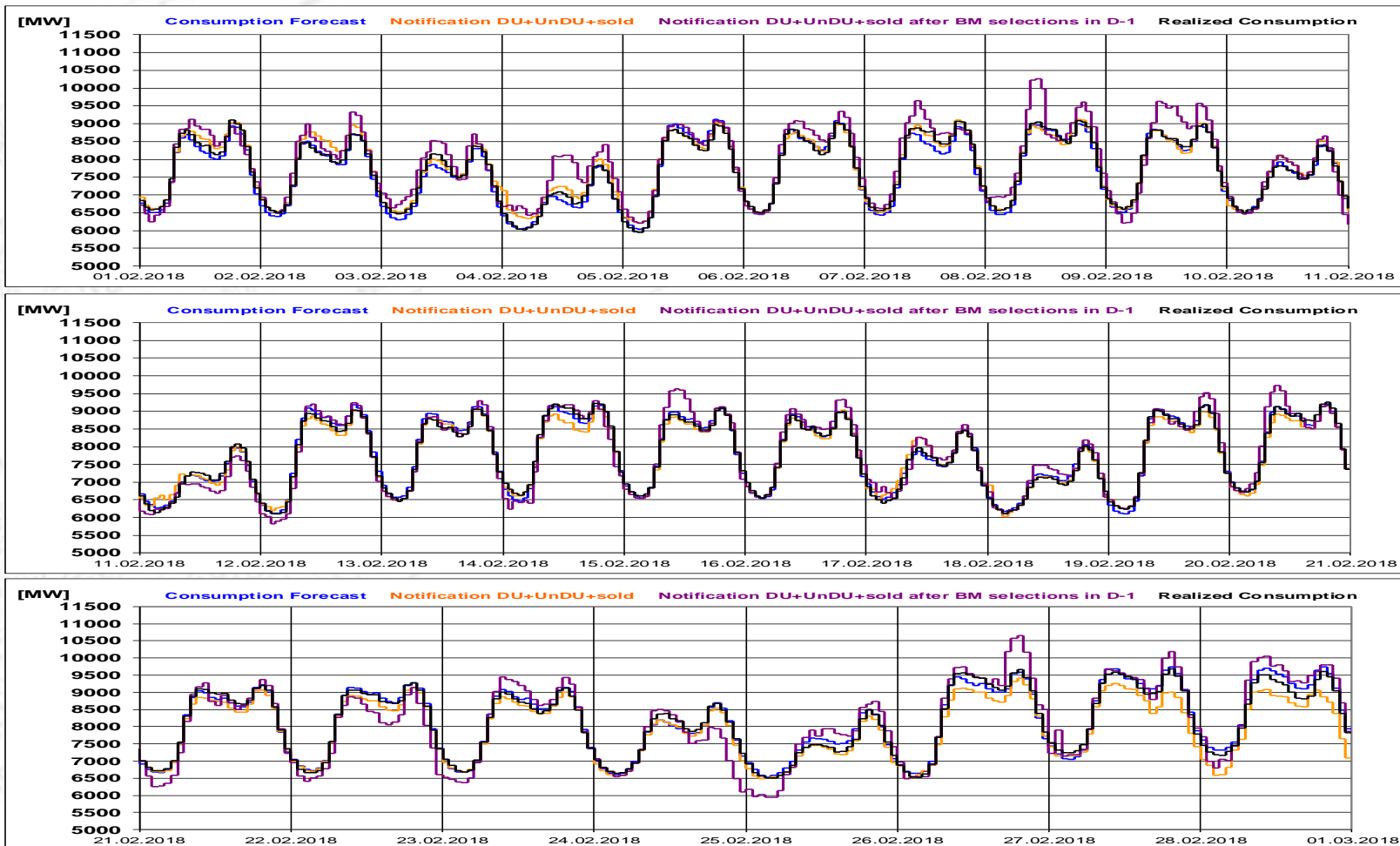
**Upward regulation - selected quantities [MWh]**



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

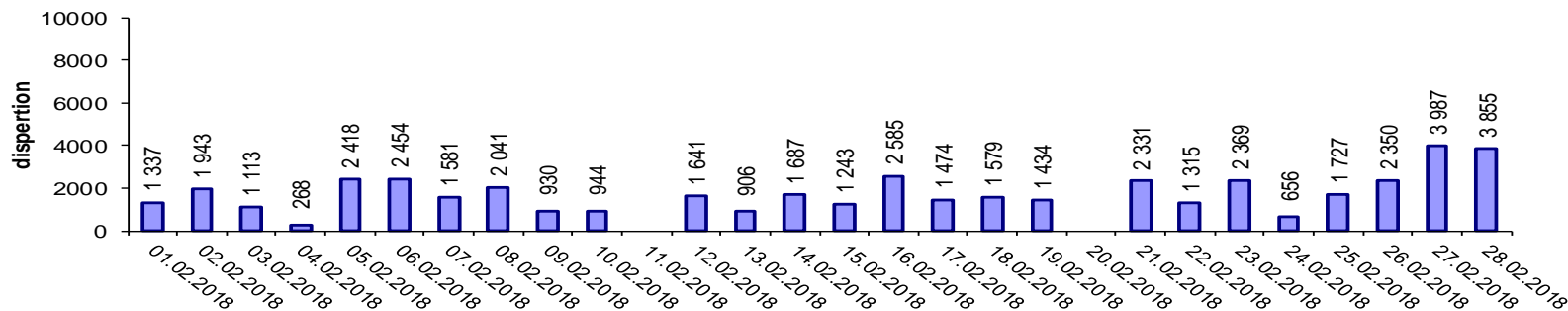


## Realized consumption. forecast. notifications. notifications after BM selections in D (end of delivery day)

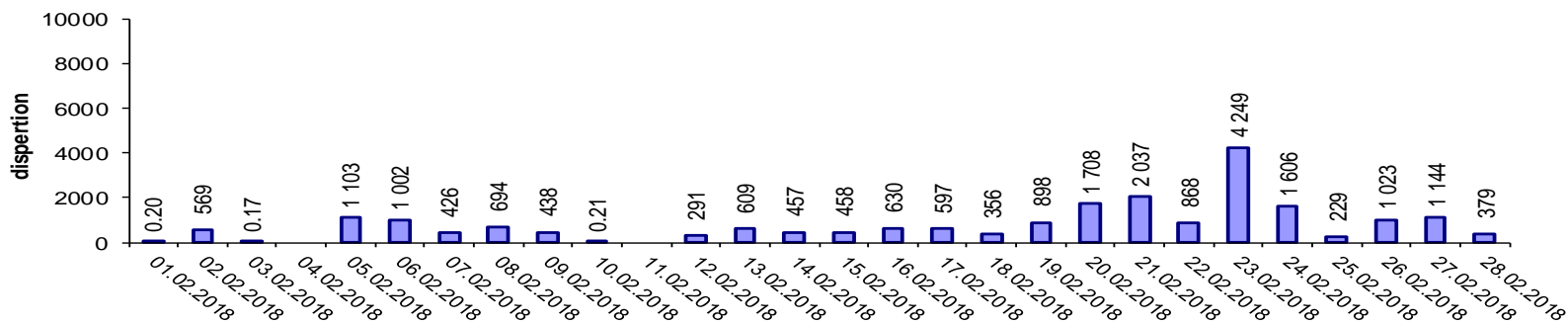


## Indicators – Price Volatility for Secondary Regulation

Price Volatility for Secondary Upward Regulation



Price Volatility for Secondary Downward Regulation



**Volatility = price dispersion on studied interval:**

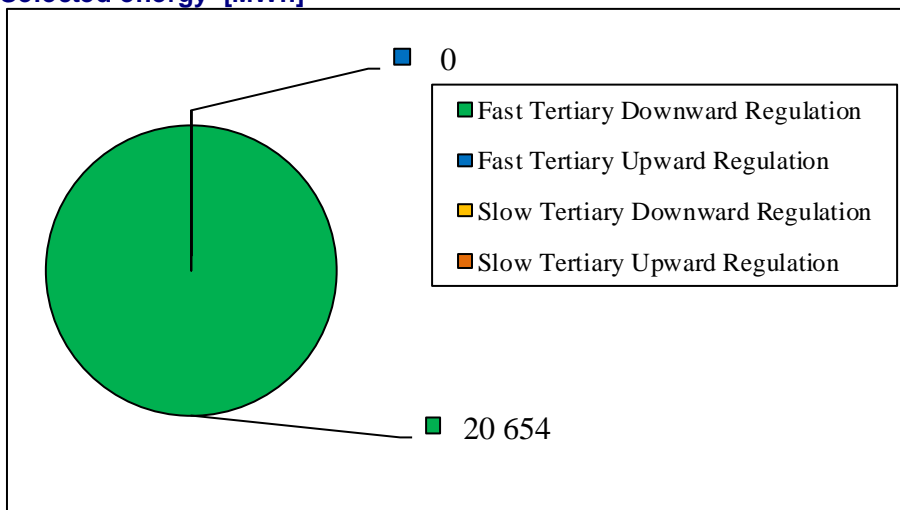
$$\frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2$$

**Public**

## Congestion Management

	Quantities [MWh]			Participants
	<i>Selected</i>	<i>Delivered</i>	<i>Deviation[%]</i>	<i>Number</i>
Fast Tertiary Downward Regulation	20654.25	19766.23	4.30%	44
Fast Tertiary Upward Regulation	-	-	-	-
Slow Tertiary Downward Regulation	-	-	-	-
Slow Tertiary Upward Regulation	-	-	-	-
	20654.25	19766.23	4.30%	

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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