

MARKET MONITORING REPORT

Balancing Market

December 2018

Abbrevations

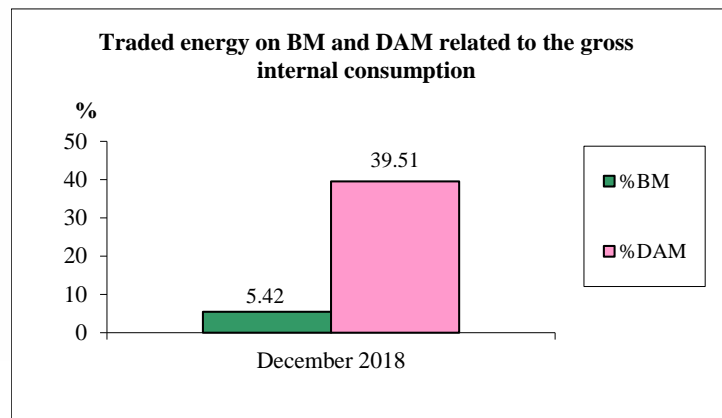
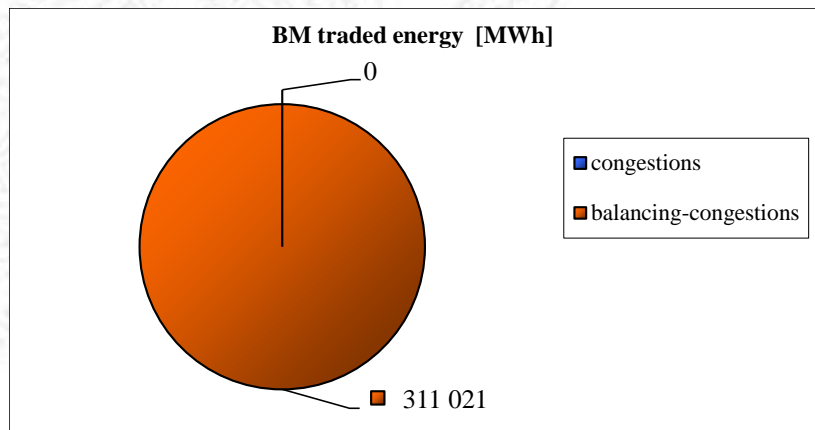
ANRE - Romanian Energy Regulatory Authority
HHI - Herfindahl-Hirschman Index
BRP - Balance Responsible Party
BM - Balancing Market
DAM - Day Ahead Market
TSO - Transmission System Operator
DU – Dispatchable Unit
PN – Physical Notification
NDC - National Dispatching Center
C1 – The market share of the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

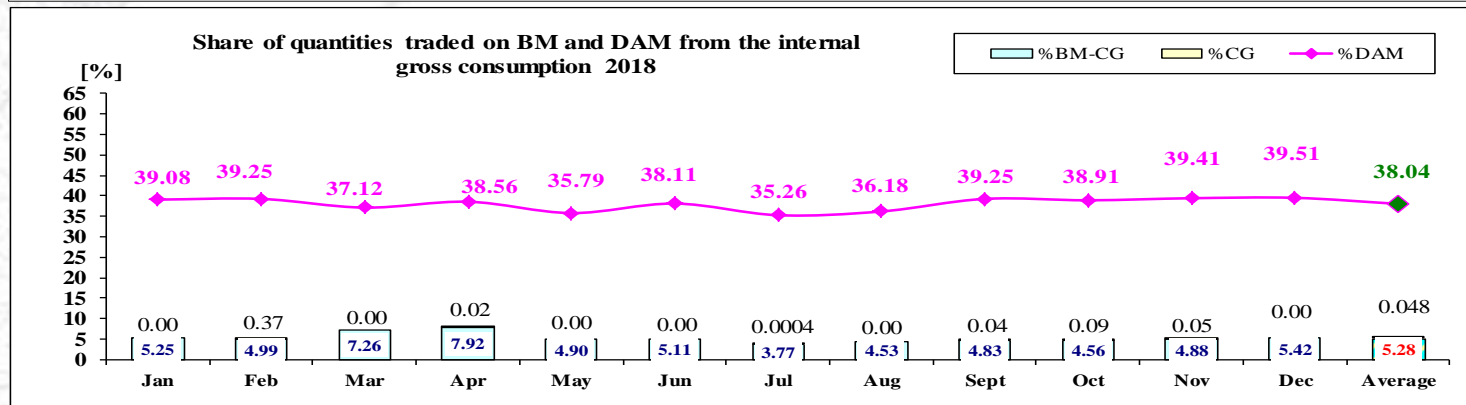
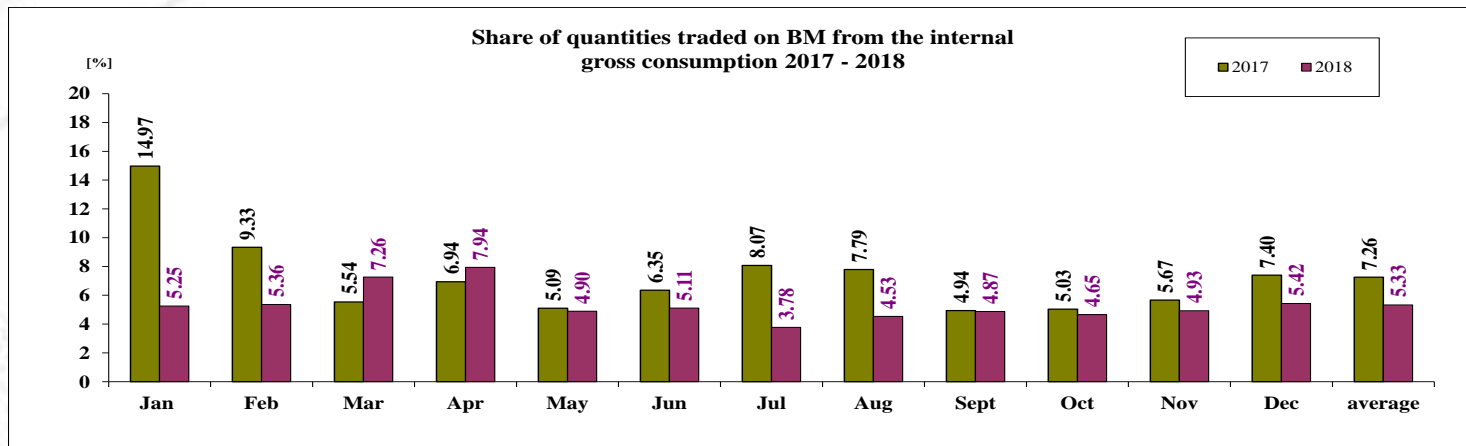
The Balance Generation/Consumption

- The average monthly value of generated power was 7 503 MW and the actual internal gross consumption was 7 706 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being **1.68%**. 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 **3.13%**. The greatest daily deviation regarding the notifications was registered in **03.12 (6.21%)**.
- The energy used in December 2018 for balancing the power system and congestion management was 311 021 MWh (with an average power of 418 MW, which means **5.42%** from the internal gross consumption). No transactions were made for congestion management.
- The energy traded in December 2018 on Day Ahead Market was 2 265 275 MWh (with an average power of 3 045 MW, which means **39.51%** from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was **164 446 187 lei** (with an average weighted price of 529 lei/MWh), from which:
 - the cost for energy traded on the Balancing Market was 164 446 187 lei (from which 835 400 startup cost);
 - the cost of the energy paid by C.N.T.E.E. Transelectrica S.A. for congestion management was 0 lei.

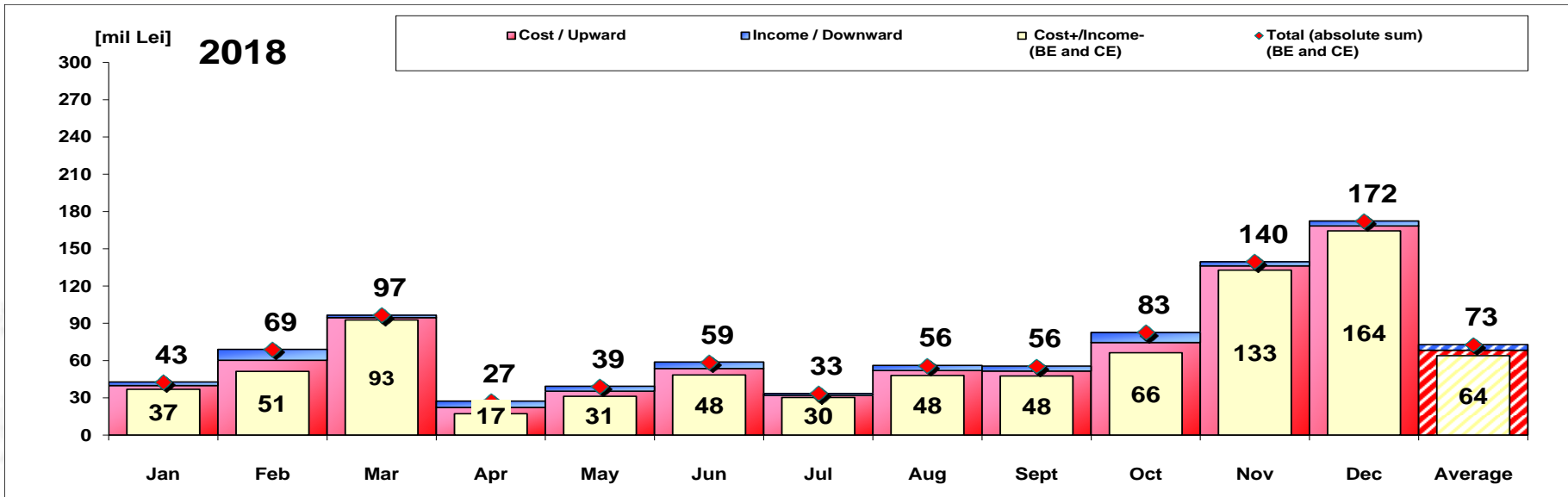


The Balance Generation / Consumption

• 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).



	2018												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Average
%BM	5.25	5.36	7.26	7.94	4.90	5.11	3.78	4.53	4.87	4.65	4.93	5.42	5.33
%DAM	39.08	39.25	37.12	38.56	35.79	38.11	35.26	36.18	39.25	38.91	39.41	39.51	38.04
%CG	0.00	0.37	0.00	0.02	0.00	0.00	0.0004	0.00	0.04	0.09	0.05	0.00	0.048
%BM-CG	5.25	4.99	7.26	7.92	4.90	5.11	3.77	4.53	4.83	4.56	4.88	5.42	5.28



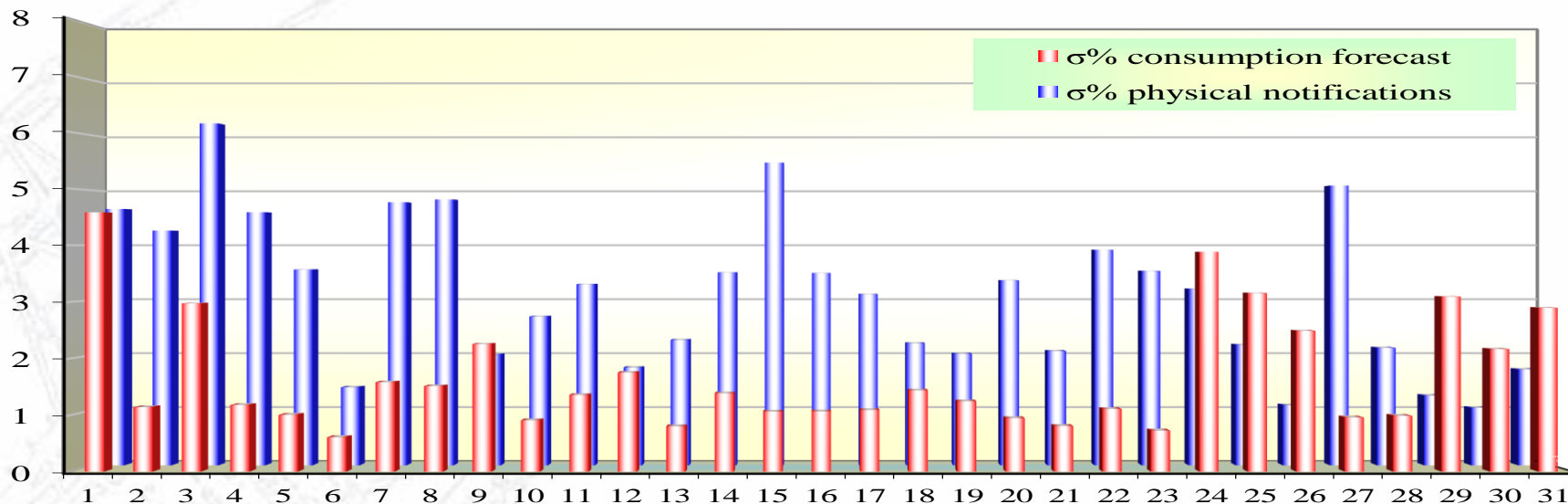
[Lei]	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Average	Total
Cost / Upward	39 819 143	60 149 383	94 609 129	22 294 472	35 295 644	53 570 278	31 866 958	52 018 823	51 549 623	74 477 715	136 154 942	168 397 523	68 350 303	820 203 632
Income / Downward	2 909 103	8 808 101	1 928 773	5 128 228	4 077 888	5 193 747	1 602 287	4 064 789	3 967 938	8 178 488	3 393 858	3 951 336	4 433 711	53 204 534
CE Cost	0	5 234 582	0	154 594	0	0	3 449	0	581 517	1 333 814	909 721	0	684 806	8 217 678
Cost for energy traded on the Balancing Market (includes startup cost)	36 910 039	46 106 700	92 680 357	17 011 649	31 217 756	48 376 531	30 261 223	47 954 034	47 000 168	64 965 413	131 851 363	164 446 187	63 231 785	758 781 420
Cost+/Income- (BE and CE)	36 910 039	51 341 283	92 680 357	17 166 243	31 217 756	48 376 531	30 264 672	47 954 034	47 581 685	66 299 227	132 761 084	164 446 187	63 916 591	766 999 098
Total (absolute sum) (BE and CE)	42 728 246	68 957 484	96 537 902	27 422 700	39 373 531	58 764 024	33 469 245	56 083 612	55 517 561	82 656 203	139 548 800	172 348 859	72 784 014	873 408 167

BE – Balancing Energy

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 December 2018



December 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	29	30	31
σ% consumption forecast	4.58	1.14	2.97	1.18	1.00	0.61	1.58	1.51	2.25	0.91	1.35	1.75	0.80	1.38	1.06	1.06	1.09	1.44	1.24	0.94	0.80	1.11	0.72	3.88	3.15	2.49	0.96	0.99	3.09	2.17	2.90
σ% physical notifications	4.66	4.27	6.21	4.60	3.56	1.42	4.78	4.83	2.01	2.71	3.29	1.78	2.28	3.50	5.50	3.49	3.11	2.22	2.02	3.36	2.08	3.92	3.53	3.21	2.19	1.09	5.08	2.13	1.27	1.04	1.74

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

R = Realized Consumption;

N = Physical Notifications;

P = Consumption Forecast.

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

σ_{average % consumption forecast} = 1.68

σ_{average % physical notifications} = 3.13

Balancing energy – Selected prices and quantities

- At the beginning of the month on the Balancing Market operated 66 BRPs, 113 market participants, holding 224 commercially operating dispatchable units.

December 2018

Downward regulation

	Prices [lei/MWh]			Quantities [MWh]		
	Monthly	Maximum	Minimum	Total	Actually	Deviation
average				selected	delivered	%
Secondary	0.11	7.00	0.10	35935.20	35935.20	0.00%
Fast Tertiary	85.54	775.48	0.20	48368.46	45212.23	6.53%
Slow Tertiary	3.00	3.00	3.00	457.10	444.71	2.71%
				84760.76	81592.14	3.74%

Upward regulation

	Monthly	Maximum	Minimum	Total	Actually	Deviation
				selected	delivered	%
Secondary	751.72	1031.00	495.18	38452.23	38452.23	0.00%
Fast Tertiary	744.07	1026.00	0.10	113071.88	110417.17	2.35%
Slow Tertiary	698.34	1008.00	0.10	81742.52	80559.16	1.45%
				233266.63	229428.56	1.65%

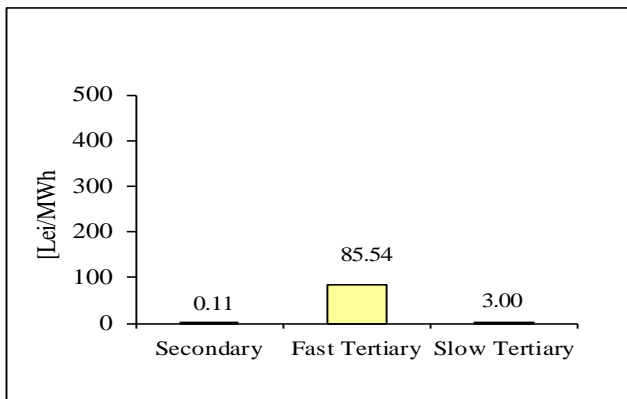
Participants						
	C1	C3	C1	C3	HHI	HHI
Number	(selected)	(actually delivered)	(selected)	(actually delivered)	(selected)	(actually delivered)
5	75.02%	98.93%	75.02%	98.93%	6072	6072
6	60.76%	96.97%	59.42%	97.12%	4715	4647
1	100.00%	100.00%	100.00%	100.00%	10000	10000

Participants						
	C1	C3	C1	C3	HHI	HHI
Number	(selected)	(actually delivered)	(selected)	(actually delivered)	(selected)	(actually delivered)
5	72.75%	98.49%	72.75%	98.49%	5771	5771
11	46.84%	71.99%	47.32%	72.93%	2666	2715
5	53.13%	98.17%	52.64%	98.15%	4357	4335

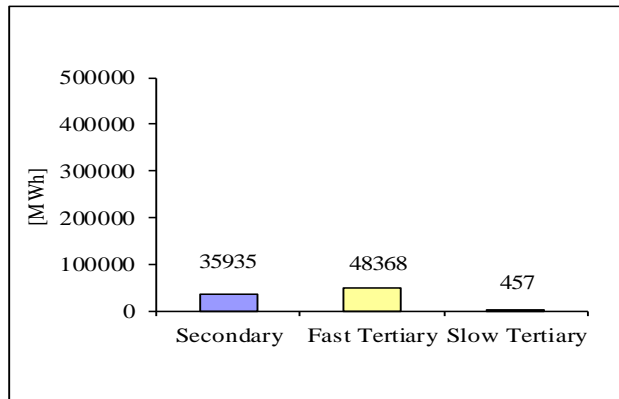
Balancing energy – Selected prices and quantities in December 2018

December 2018

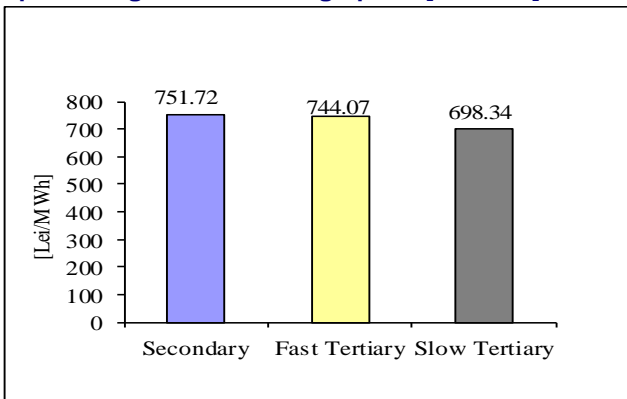
Downward regulation - average price [lei/MWh]



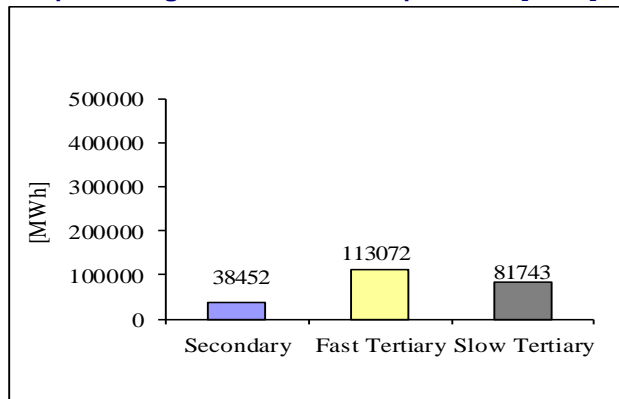
Downward regulation - selected quantities [MWh]



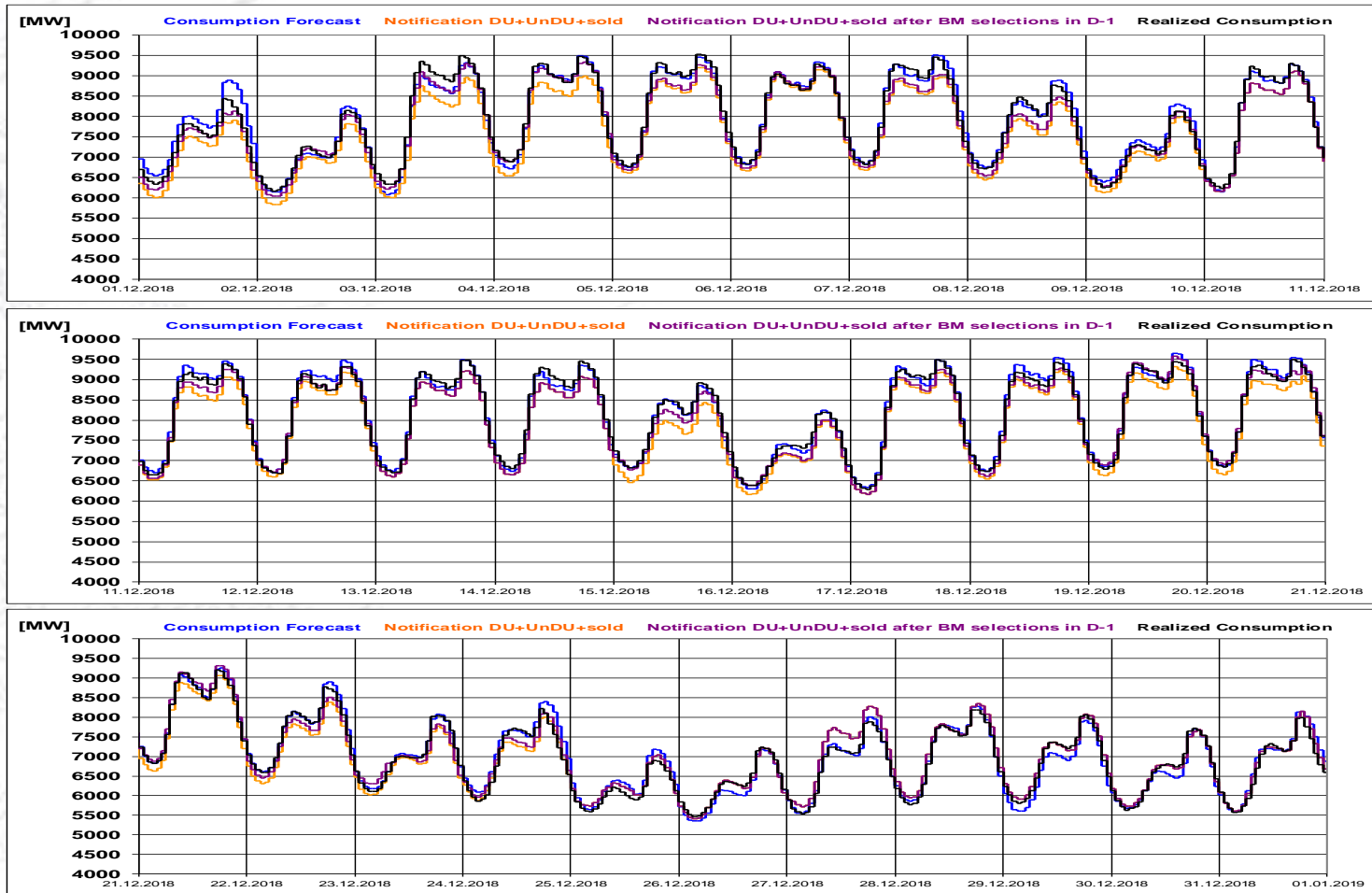
Upward regulation - average price [lei/MWh]



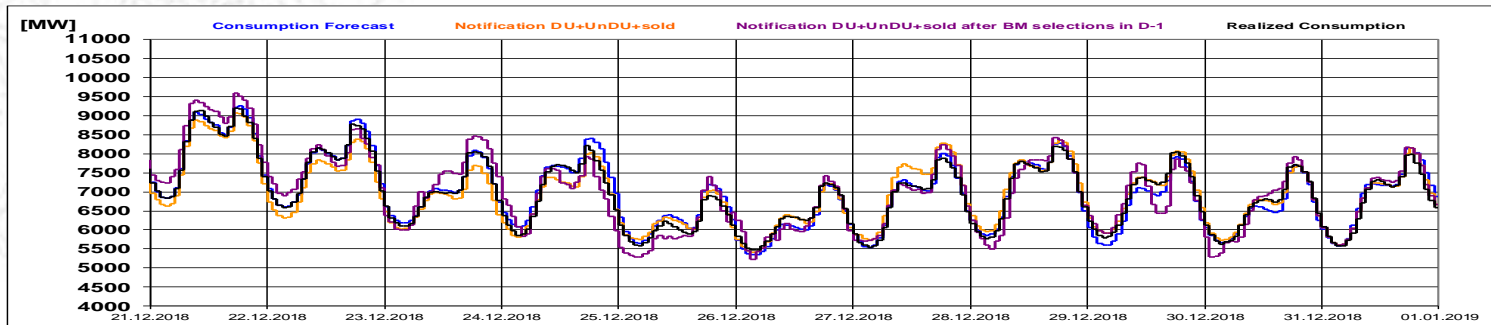
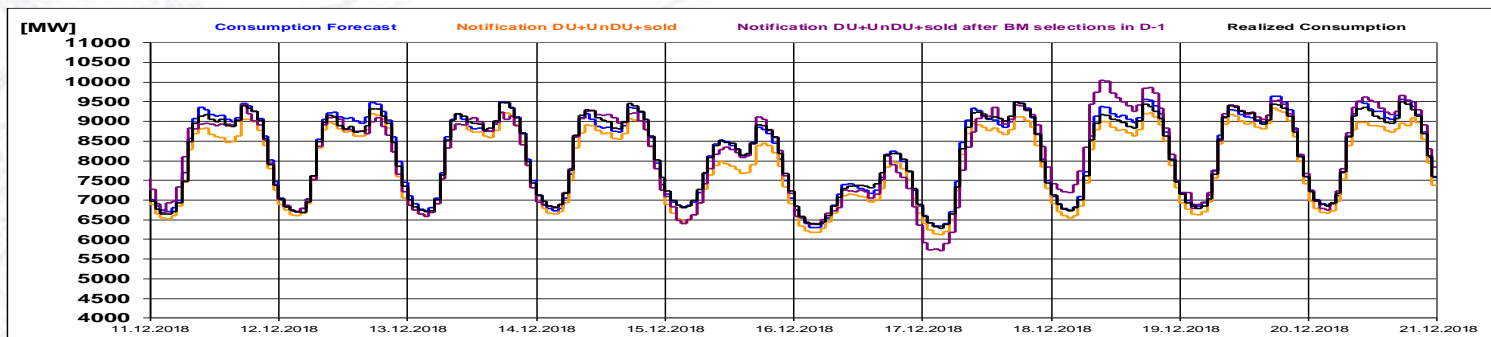
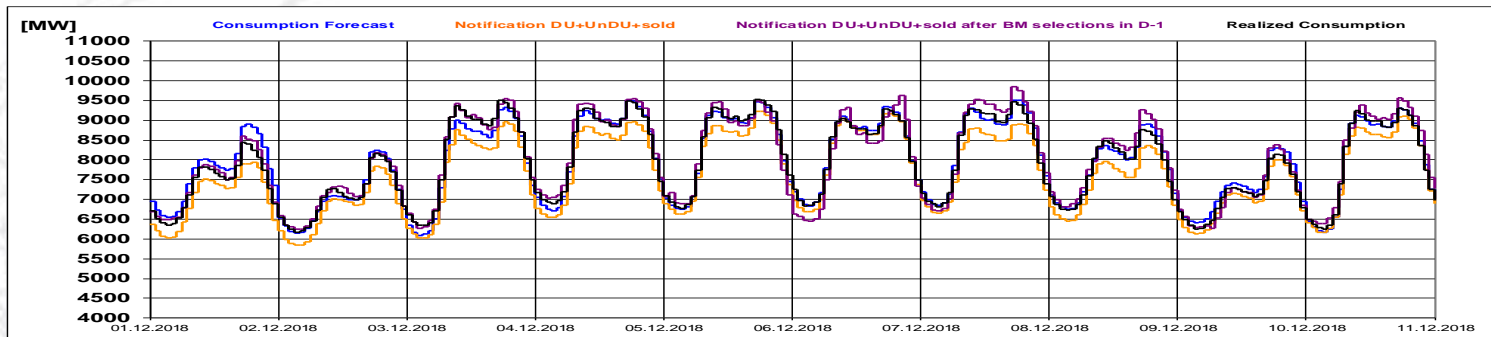
Upward regulation - selected quantities [MWh]



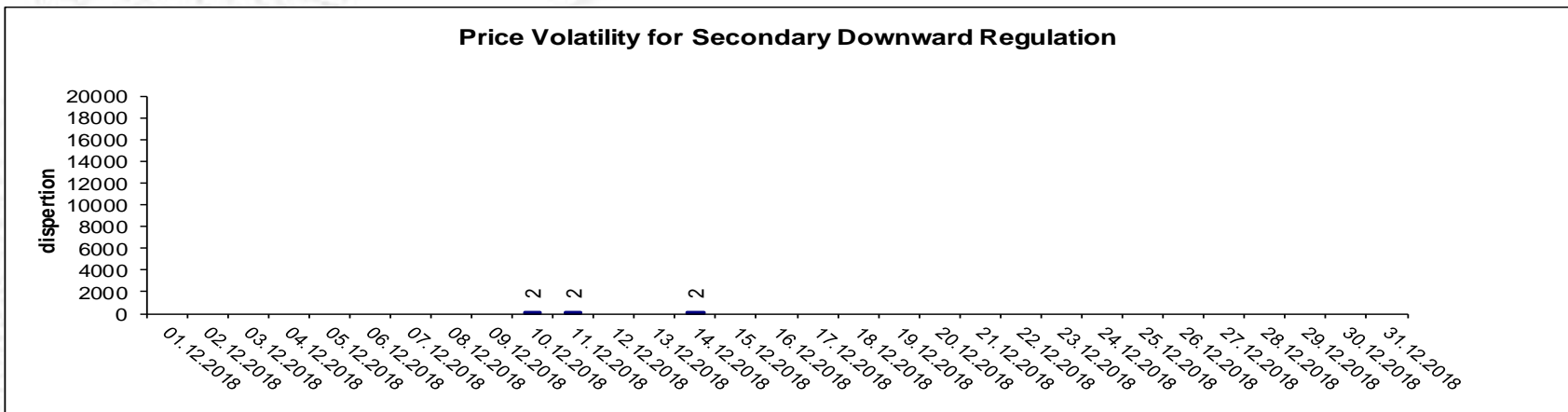
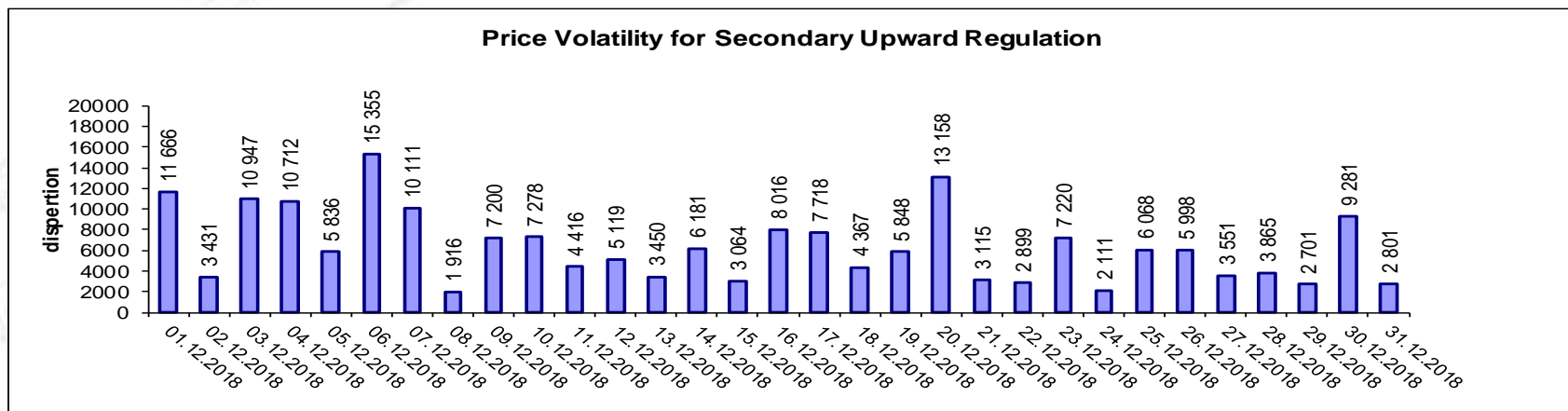
Realized consumption, forecast, notifications, notifications after BM selections in D-1



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



Indicators – Price Volatility for Secondary Regulation



Volatility = price dispersion on studied interval:

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

Public

Email: Monitorizare.Piata@transelectrica.ro

Fax: 021 3035630