



Transelectrica®
Societate Administrată în Sistem Dualist

MARKET MONITORING REPORT

Balancing Market

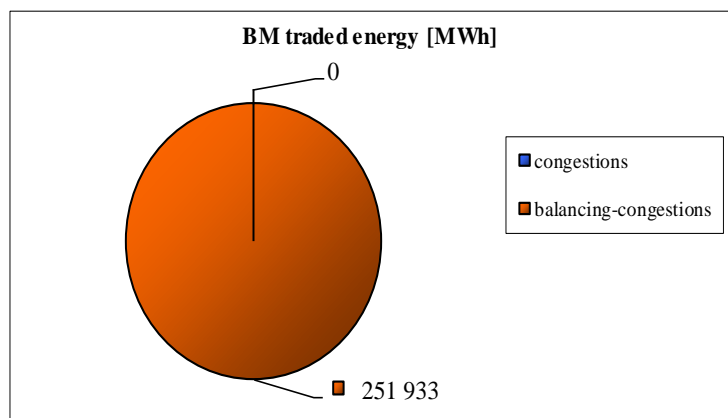
November 2019

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

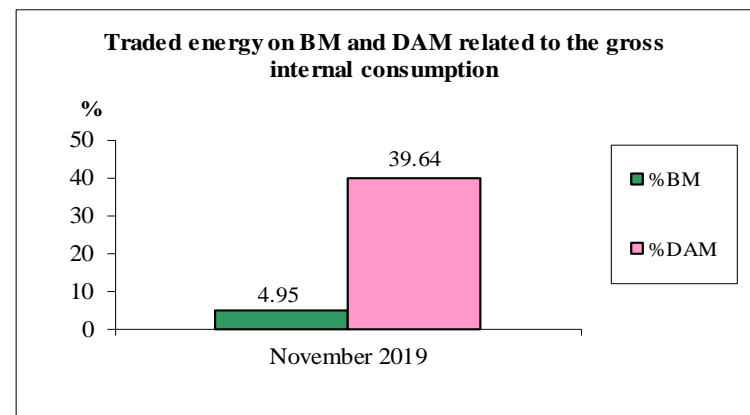
According to the Commercial Code, Transelectrica, the Romanian Transmission System Operator, operates and monitors the activity of 3 types of markets: Balancing Market, Ancillary Services Market and Market for Allocation of Cross-Border Capacities.

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 average monthly value of generated power was 6 881 MW and the actual internal gross consumption was 7 071 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being 1.22%. 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 2.03%. The greatest daily deviation regarding the notifications was registered in 05.11 (4.53%).
- The energy used in November 2019 for balancing the power system and congestion management was 251 933 MWh (with an average power of 350 MW, which means **4.95%** from the internal gross consumption). No transactions were made for congestion management.
- The energy traded in November 2019 on Day Ahead Market was 2 018 245 MWh (with an average power of 2 803 MW, which means **39.64%** from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 30 719 284 lei (with an average weighted price of 122 lei/MWh), from which:
 - the cost for energy traded on the Balancing Market was 30 719 284 lei (from which 0 lei startup cost);
 - the cost of the energy paid by C.N.T.E.E. Transelectrica S.A. for congestion management was 0 lei.



November 2019





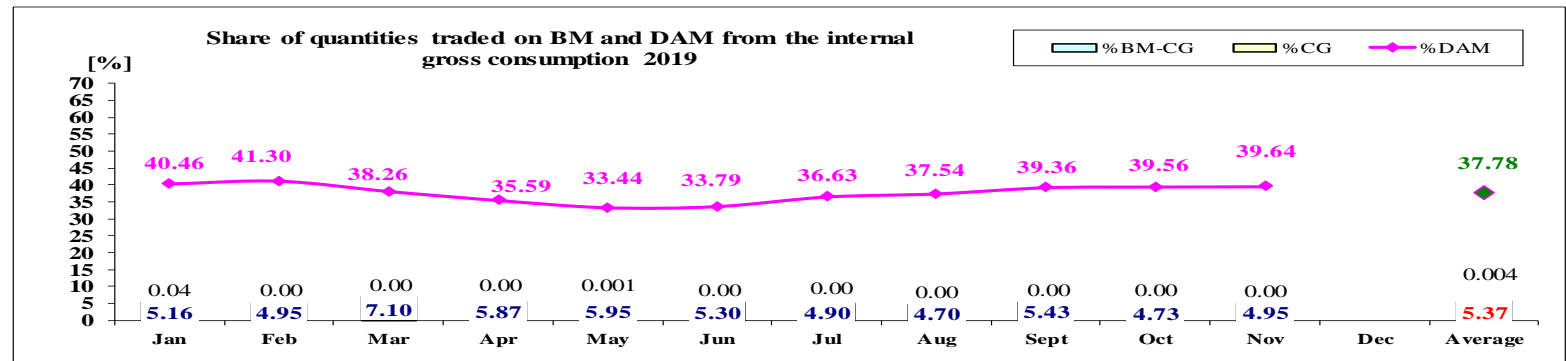
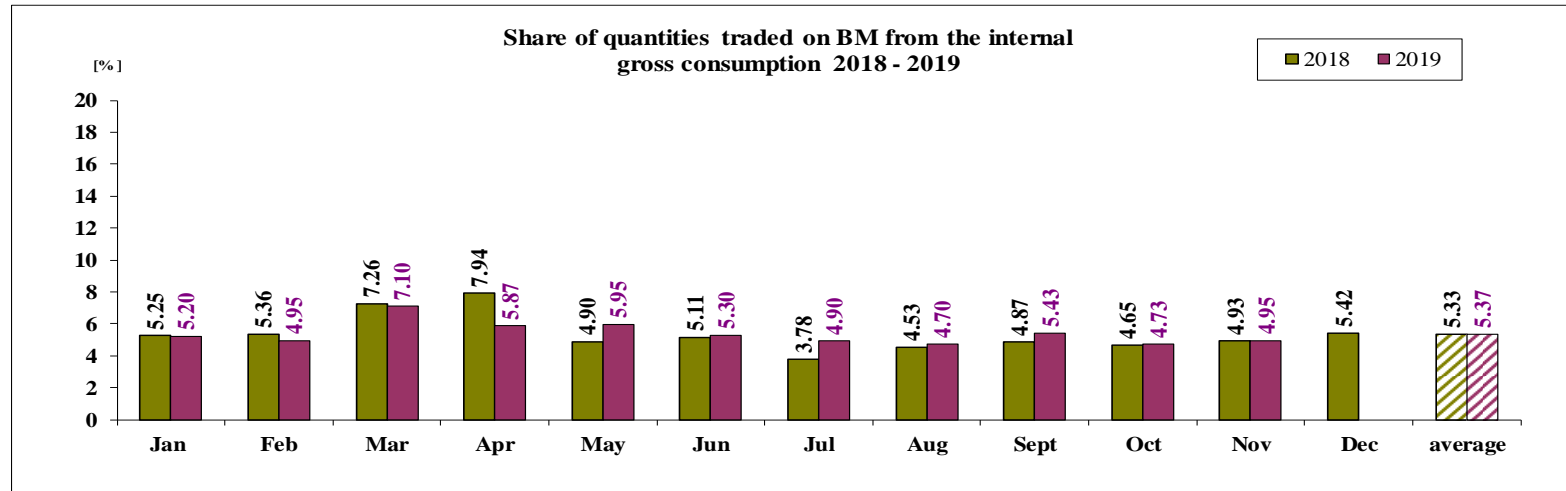
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Balancing Market

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).



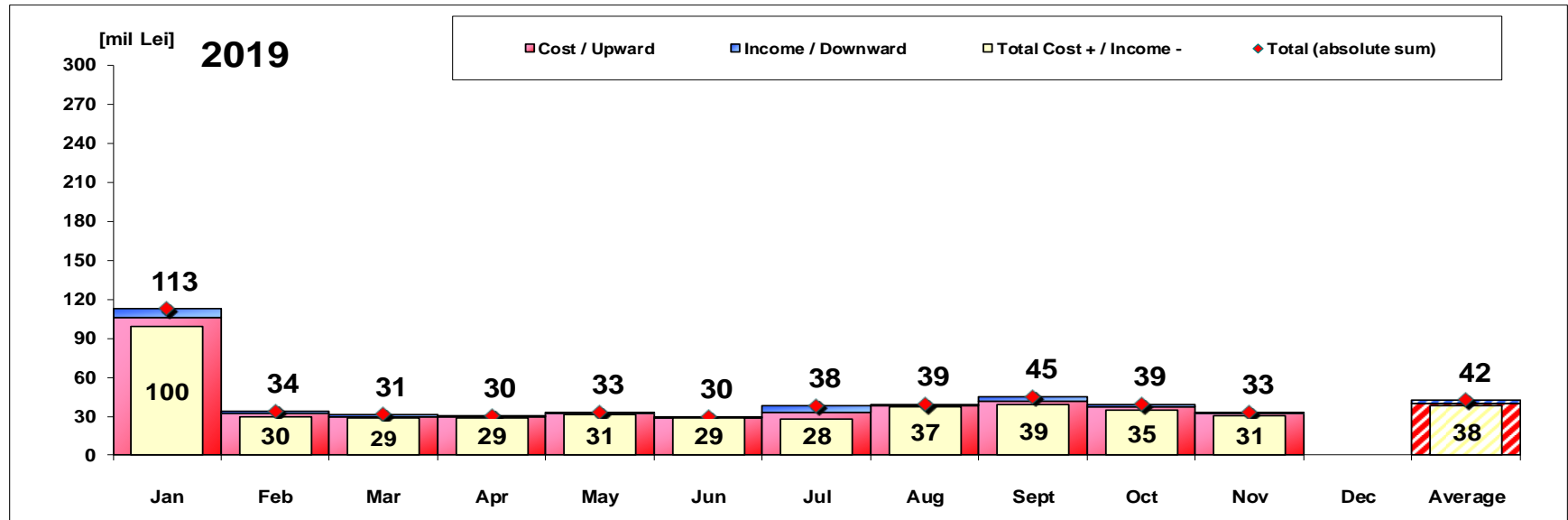
	2019												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Average
%BM	5.20	4.95	7.10	5.87	5.95	5.30	4.90	4.70	5.43	4.73	4.95		5.37
%DAM	40.46	41.30	38.26	35.59	33.44	33.79	36.63	37.54	39.36	39.56	39.64		37.78
%CG	0.04	0.00	0.00	0.00	0.001	0.00	0.00	0.00	0.00	0.00	0.00		0.004
%BM-CG	5.16	4.95	7.10	5.87	5.95	5.30	4.90	4.70	5.43	4.73	4.95		5.37



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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	106 045 870	32 017 367	29 926 340	29 740 335	31 990 334	29 090 995	32 824 552	38 192 956	42 023 528	37 148 074	31 891 703		40 081 096	440 892 055
Income / Downward	6 528 407	2 166 232	1 159 092	595 988	1 036 120	512 028	4 972 126	1 050 328	2 862 264	2 264 520	1 172 419		2 210 866	24 319 524
CE Cost	1 639 293	0	0	0	12 911	0	0	0	0	0	0		150 200	1 652 204
Cost for energy traded on the Balancing Market (includes startup cost)	97 878 170	29 851 135	28 767 248	29 144 347	30 941 303	28 578 967	27 852 426	37 142 628	39 161 264	34 883 555	30 719 284		37 720 030	414 920 327
Cost+/Income-(BE and CE)	99 517 463	29 851 135	28 767 248	29 144 347	30 954 214	28 578 967	27 852 426	37 142 628	39 161 264	34 883 555	30 719 284		37 870 230	416 572 531
Total (absolute sum) (BE and CE)	112 574 277	34 183 599	31 085 432	30 336 324	33 026 454	29 603 024	37 796 678	39 243 284	44 885 793	39 412 594	33 064 121		42 291 962	465 211 579

CE – Congestion Energy

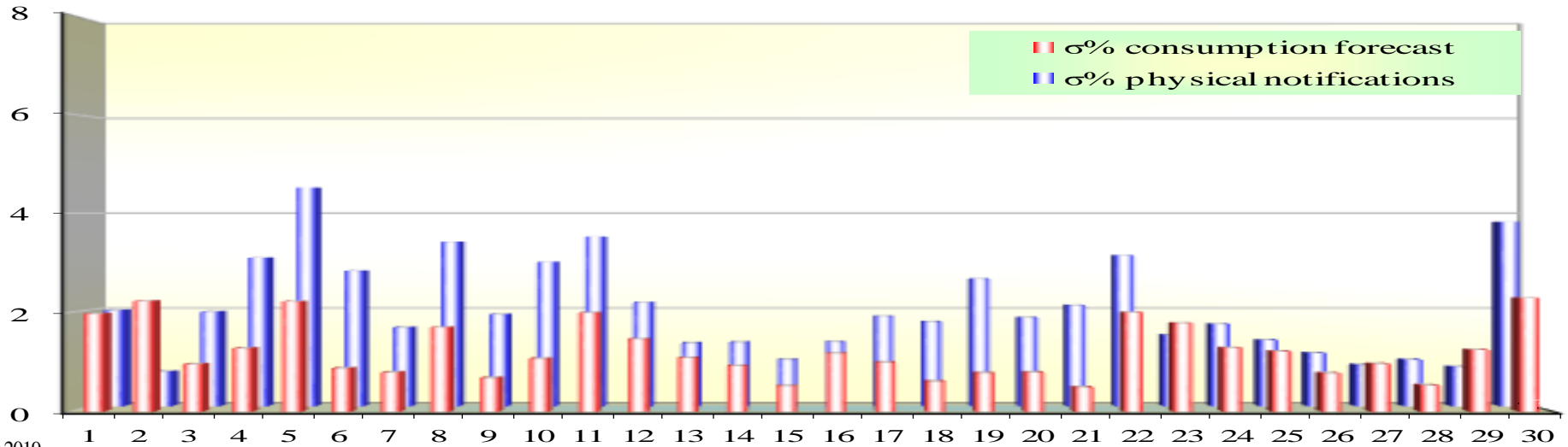
* The average annual value of BM transactions (the absolute sum of upward and downward transactions) was calculated as average of monthly values.



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Balancing Market

Standard deviation of physical notifications and consumption forecast against the actual consumption in November 2019



November 2019	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
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	1.97	2.23	0.96	1.28	2.22	0.87	0.79	1.70	0.68	1.07	1.99	1.46	1.08	0.92	0.52	1.17	0.99	0.61	0.78	0.79	0.49	2.00	1.79	1.29	1.21	0.78	0.96	0.53	1.25	2.29
σ% physical notifications	1.99	0.71	1.96	3.08	4.53	2.80	1.63	3.40	1.90	2.99	3.51	2.15	1.31	1.32	0.96	1.33	1.86	1.75	2.64	1.83	2.09	3.12	1.47	1.70	1.37	1.10	0.85	0.96	0.81	3.82

σ_{average} % consumption forecast = 1.22

σ_{average} % physical notifications = 2.03

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

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

R = Realized Consumption;

N = Physical Notifications;

P = Consumption Forecast.

Public

Balancing Market

Balancing energy – Selected prices and quantities

• At the beginning of the month on the Balancing Market operated 64 BRPs, 111 market participants, holding 215 commercially operating dispatchable units. Starting with 11th of November dispatchable units list BRAI1 (30WTE--BRAI11--0) and BRAI2 (30WTE--BRAI2---3) having as BMP COMPLEXUL ENERGETIC OLTENIA S.A. (30XROCENCRAIOVAM) were removed from BRP list.

November 2019

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)		
Secondary	0.10	0.10	0.10	52943.46	52943.46	0.00%	5	64.23%	98.53%	64.23%	98.53%	4901	4901
Fast Tertiary	8.51	745.91	0.10	146089.31	139992.45	4.17%	8	41.33%	92.80%	42.38%	93.03%	3266	3283
Slow Tertiary	-	-	-	-	-	-	-	-	-	-	-	-	-
				199032.77	192935.90	3.06%							

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	656.32	1092.00	451.00	26392.73	26392.73	0.00%	5	63.95%	98.55%	63.95%	98.55%	4871	4871
Fast Tertiary	445.68	1091.00	0.10	33636.76	32604.59	3.07%	11	50.15%	92.80%	51.35%	93.04%	4166	4208
Slow Tertiary	-	-	-	-	-	-	-	-	-	-	-	-	-
				60029.49	58997.33	1.72%							



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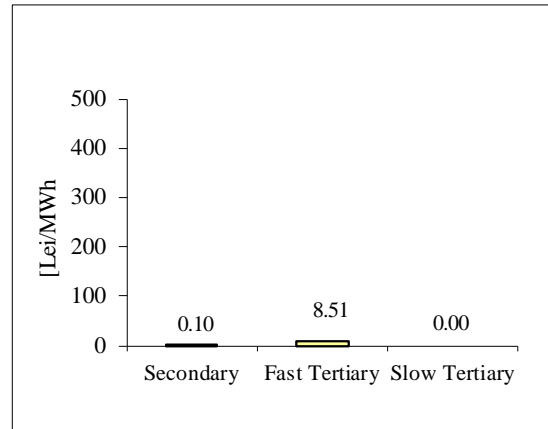
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Balancing Market

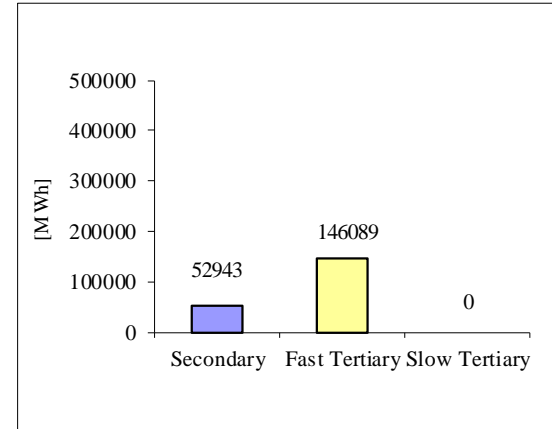
Balancing energy – Selected prices and quantities in November 2019

November 2019

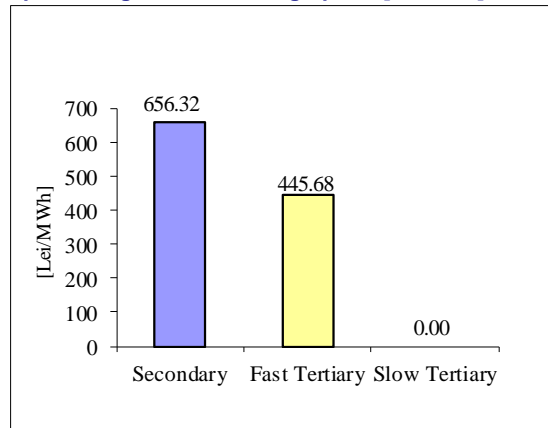
Downward regulation - average price [lei/MWh]



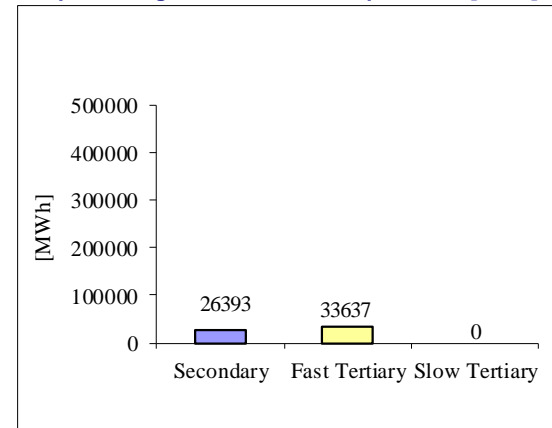
Downward regulation - selected quantities [MWh]



Upward regulation - average price [lei/MWh]



Upward regulation - selected quantities [MWh]



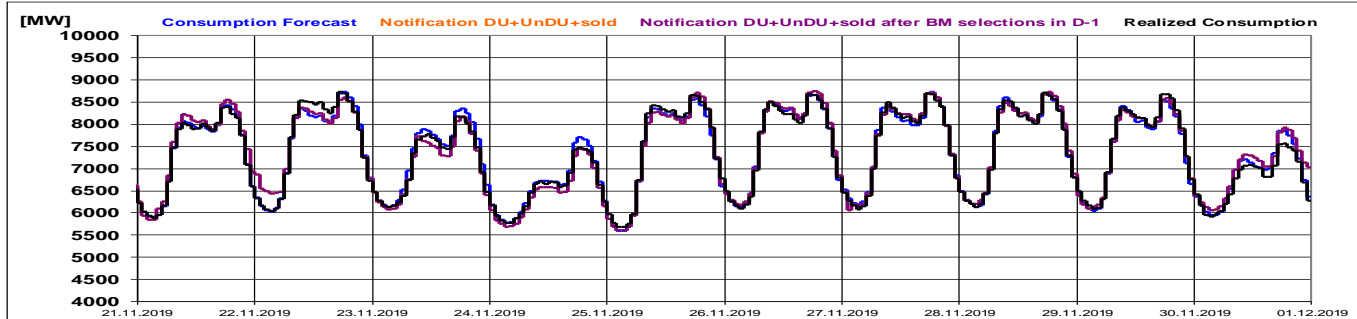
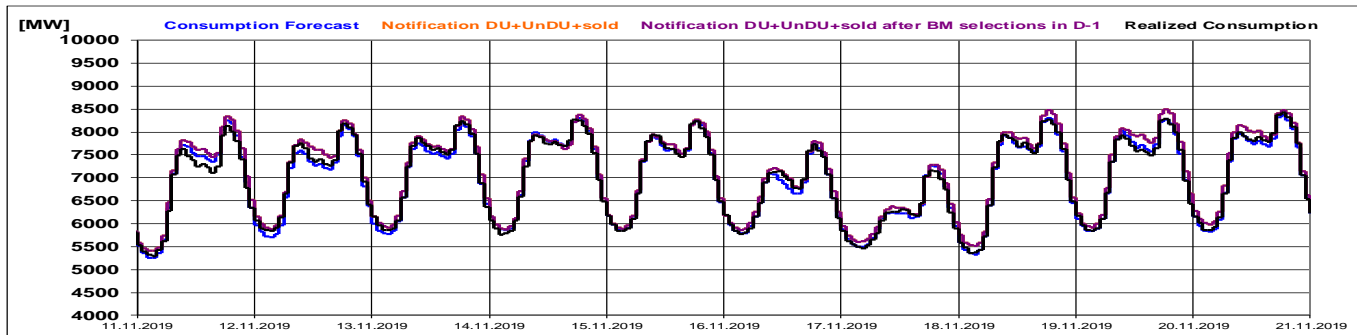
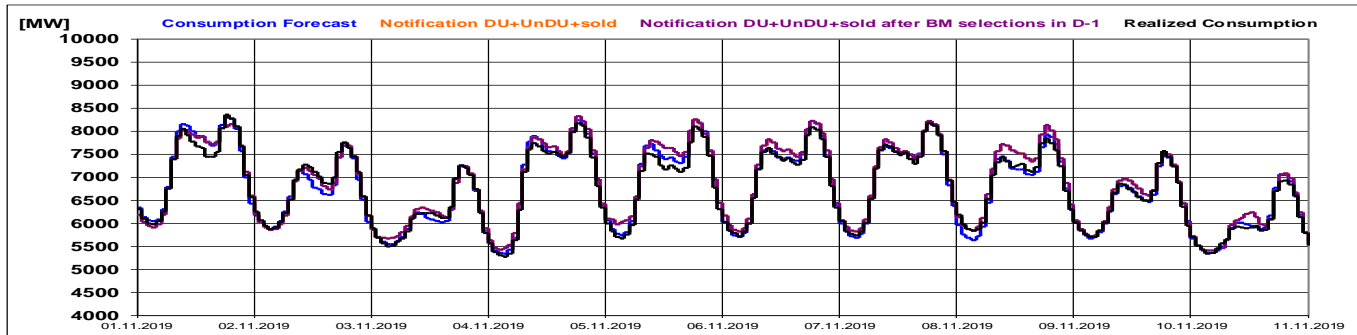


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Realized consumption, forecast, notifications,
notifications after BM selections in D-1



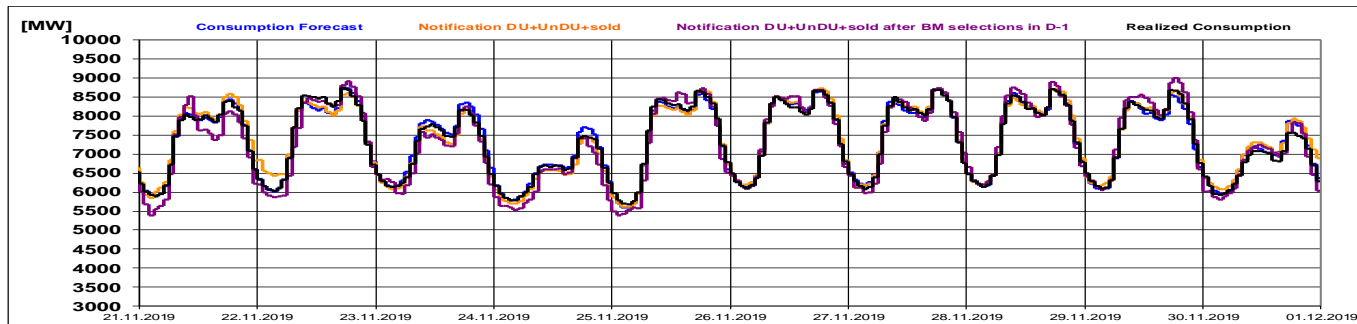
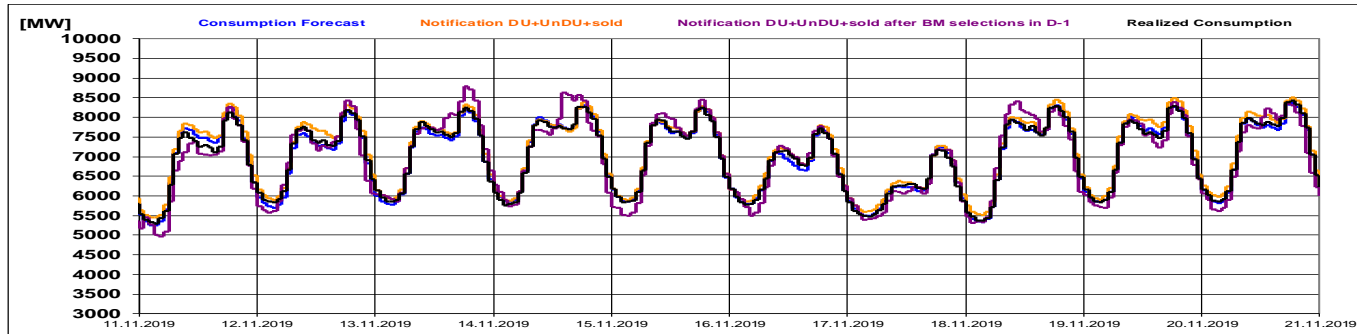
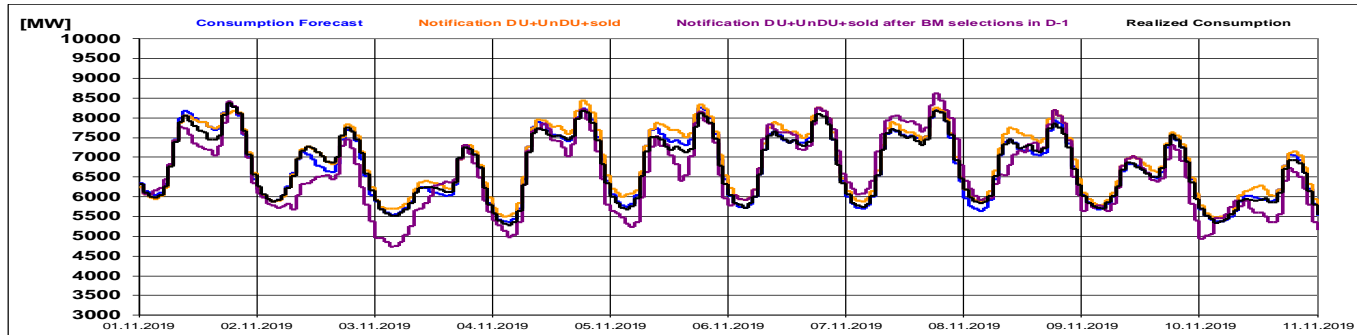


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Balancing Market

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



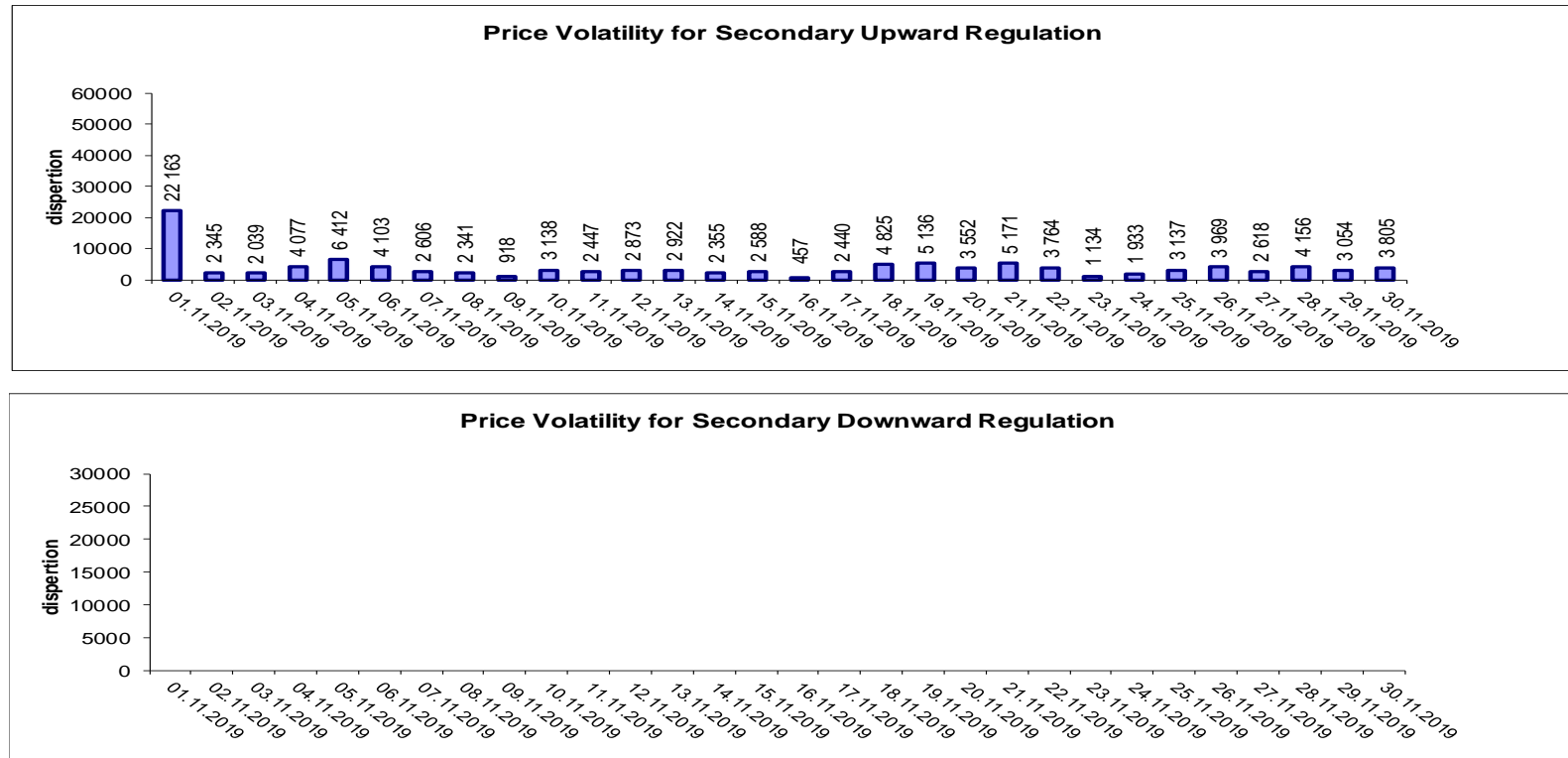


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Balancing Market

Indicators – Price Volatility for Secondary Regulation



Price volatility for Secondary Downward Regulation, determined as the daily price dispersion, recorded zero values throughout the month, because of constant price values from one hour to the next.

Volatility = price dispersion on studied interval:

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



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