



Transelectrica®
Societate Administrată în Sistem Dualist

MARKET MONITORING REPORT

Balancing Market

December 2019

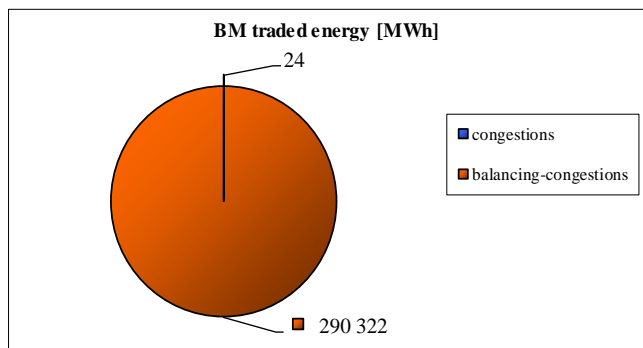
ANRE - Romanian Energy Regulatory Authority
HHI - Herfindahl-Hirschman Index
BRP - Balance Responsible Party
BM - Balancing Market
DAM - Day Ahead Market
TSO - Transmission System Operator
DU – Dispatchable Unit
PN – Physical Notification
NDC - National Dispatching Center
C1 – The market share of the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

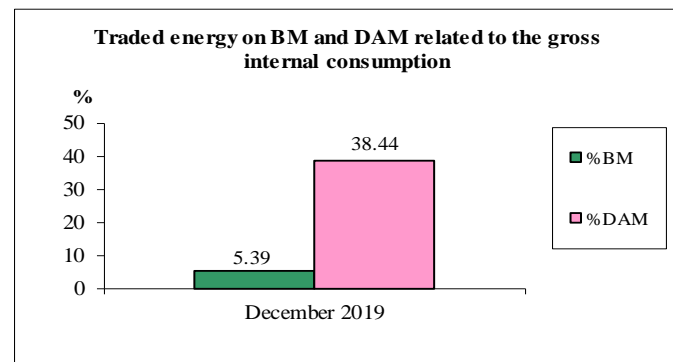
Using the records from the markets data bases, Transelectrica prepares daily, weekly and monthly monitoring reports. A part of the data included in these reports (those data which are not confidential) are published on the website www.transelectrica.ro (section Transparency).

The Balance Generation/Consumption

- The average monthly value of generated power was 7 042 MW and the actual internal gross consumption was 7 246 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being **2.01%**. 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 **3.22%**. The greatest daily deviation regarding the notifications was registered in **25.12 (10.81%)**.
- The energy used in December 2019 for balancing the power system and congestion management was 290 346 MWh (with an average power of 390 MW, which means **5.39%** from the internal gross consumption) from which:
 - the energy used for congestion management was 24 MWh (with an average power of 0.03 MW, which means 0.0004% from the internal gross consumption).
- The energy traded in December 2019 on Day Ahead Market was 2 072 259 MWh (with an average power of 2 785 MW, which means **38.44%** from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 30 737 995 lei (with an average weighted price of 106 lei/MWh), from which:
 - the cost of the energy paid by C.N.T.E.E. Transelectrica S.A. for congestion management was de 4 324 lei (with an average weighted price of 183 lei/MWh, which means 0.01% from total cost);
 - the cost of the energy paid by C.N.T.E.E. Transelectrica S.A. for balancing was 30 733 671 lei (startup costs 0 lei).



December 2019





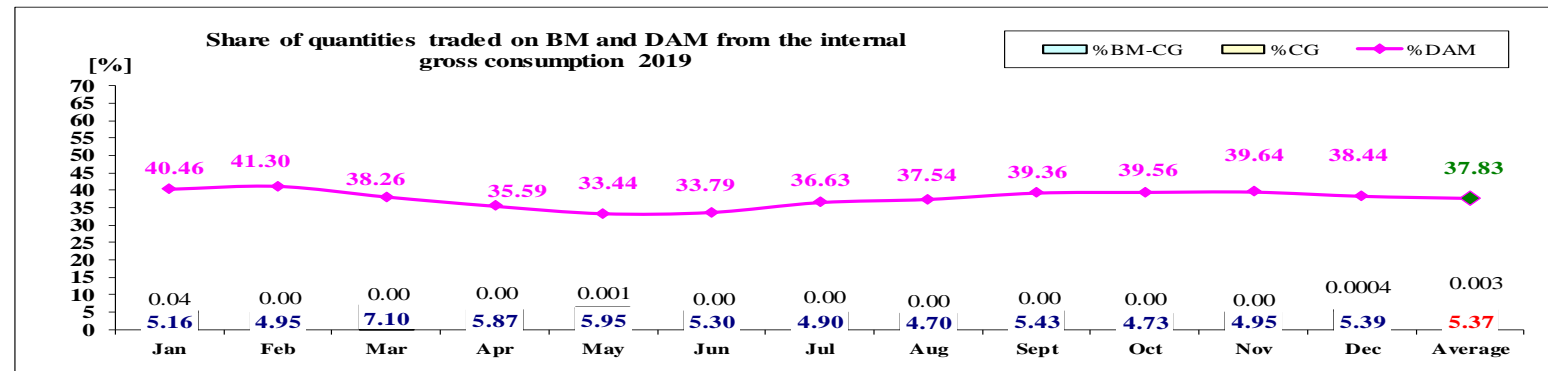
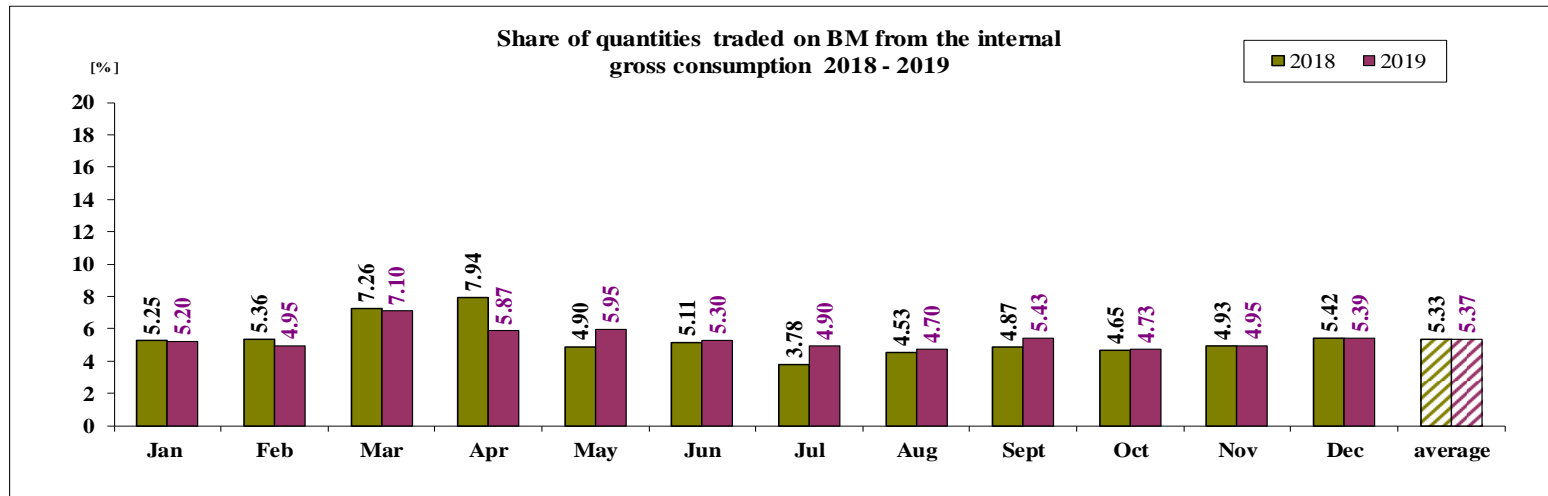
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Balancing Market

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).



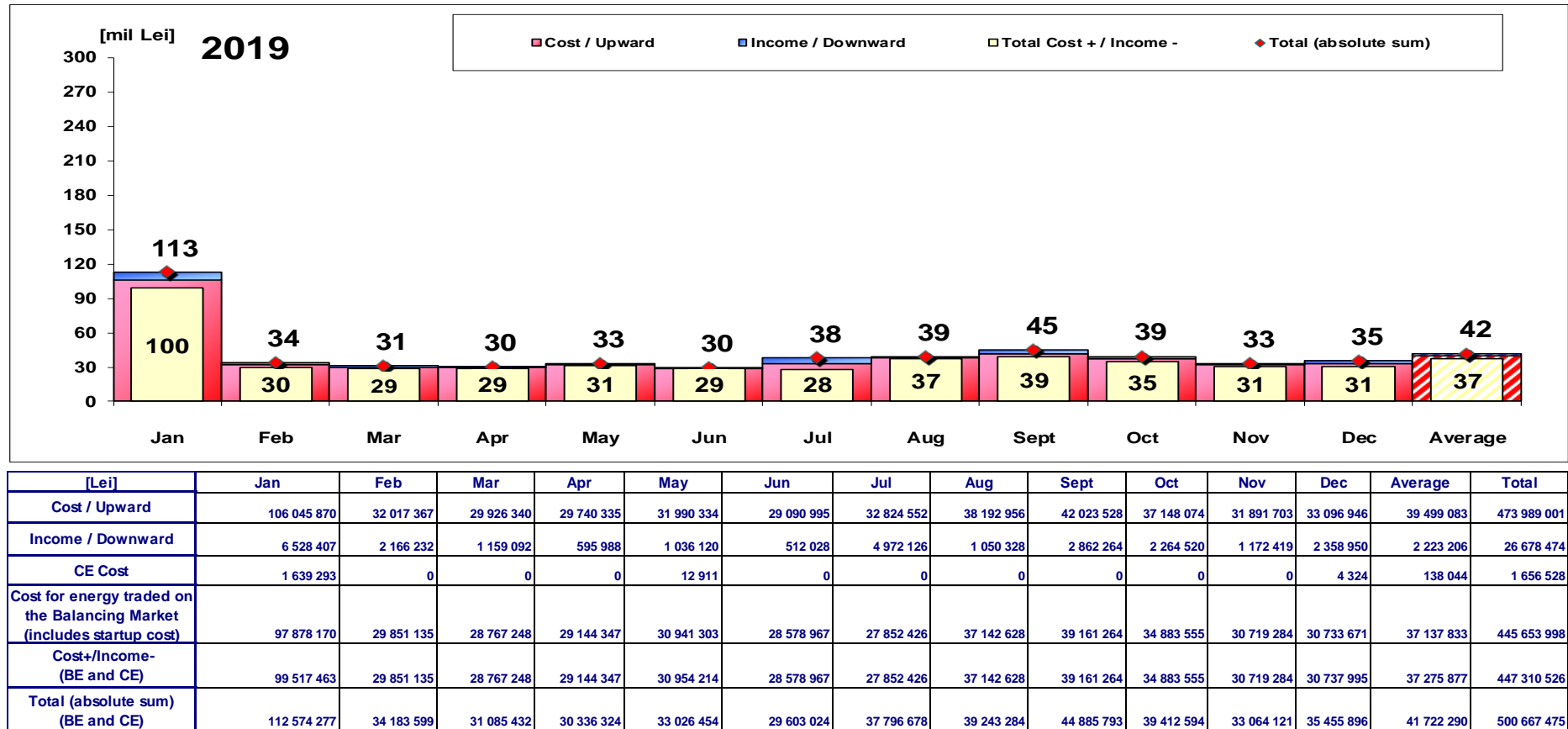
	2019												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Average
%BM	5.20	4.95	7.10	5.87	5.95	5.30	4.90	4.70	5.43	4.73	4.95	5.39	5.37
%DAM	40.46	41.30	38.26	35.59	33.44	33.79	36.63	37.54	39.36	39.56	39.64	38.44	37.83
%CG	0.04	0.00	0.00	0.00	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.0004	0.003
%BM-CG	5.16	4.95	7.10	5.87	5.95	5.30	4.90	4.70	5.43	4.73	4.95	5.39	5.37



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Balancing Energy Market Transactions



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.

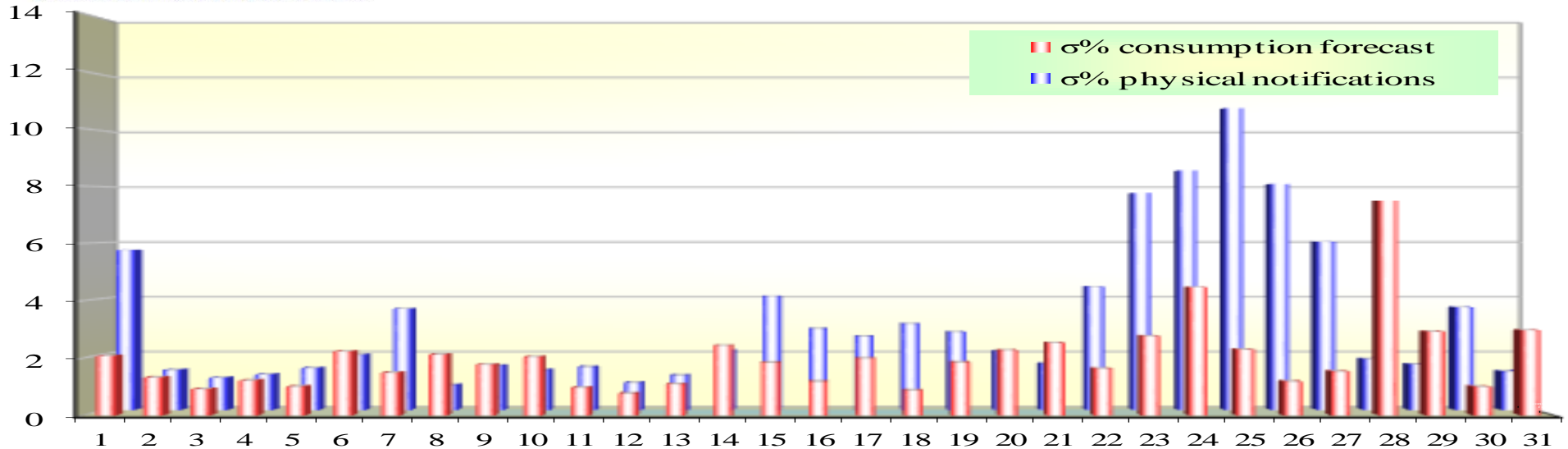


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Balancing Market

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



December 2019

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	2.08	1.33	0.92	1.22	1.01	2.23	1.49	2.13	1.77	2.05	0.97	0.76	1.09	2.44	1.84	1.18	1.99	0.88	1.85	2.27	2.53	1.63	2.77	4.47	2.30	1.18	1.54	7.49	2.93	1.00	2.97
σ% physical notifications	5.73	1.43	1.15	1.27	1.50	1.98	3.62	0.89	1.59	1.44	1.54	0.97	1.24	2.13	4.07	2.91	2.64	3.08	2.79	2.10	1.66	4.42	7.77	8.58	10.81	8.10	6.03	1.82	1.63	3.68	1.38

σ_{average % consumption forecast} = 2.01

σ_{average % physical notifications} = 3.22

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

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

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 67 BRPs, 111 market participants, holding 215 commercially operating dispatchable units.

December 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)	(actually delivered)	
Secondary	0.12	7.00	0.10	52899.36	52899.36	0.00%	4	63.25%	97.73%	63.25%	97.73%	4873	4873
Fast Tertiary	9.29	873.00	0.10	147210.67	140669.60	4.44%	25	43.42%	94.46%	44.39%	95.19%	3374	3426
Slow Tertiary	29.36	81.00	0.12	36053.50	35980.70	0.20%	2	74.92%	100.00%	74.87%	100.00%	6242	6237
				236163.53	229549.66	2.80%							

Upward regulation

	Monthly	Maximum	Minimum	Total	Actually	Deviation	C1	C3	C1	C3	HHI	HHI	
	average			selected	delivered	%	Number	(selected)	(actually delivered)	(selected)	(selected)	(actually delivered)	
Secondary	653.43	1048.98	450.10	29164.33	29164.33	0.00%	4	62.27%	96.83%	62.27%	96.83%	4753	4753
Fast Tertiary	443.88	1047.98	0.10	32541.72	31631.92	2.80%	9	69.67%	93.19%	70.45%	93.52%	5313	5403
Slow Tertiary	-	-	-	-	-	-	-	-	-	-	-	-	-
				61706.05	60796.26	1.47%							



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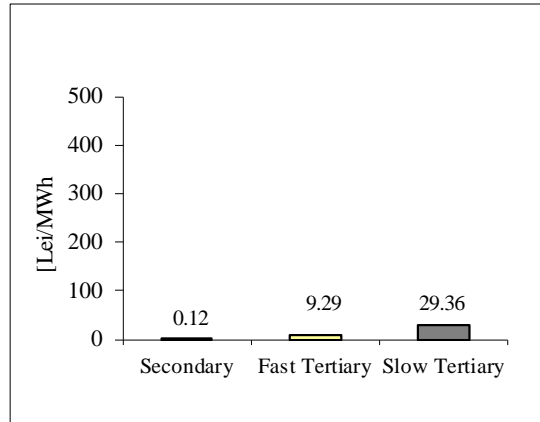
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Balancing Market

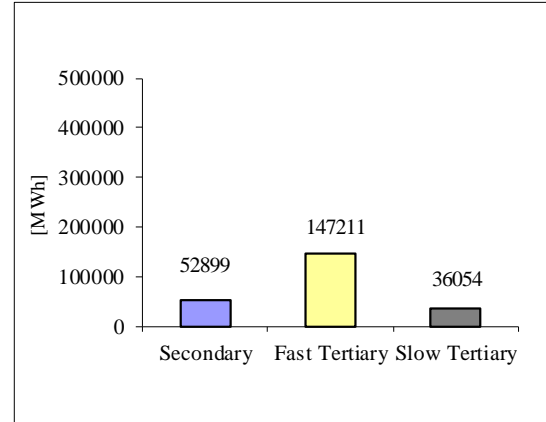
Balancing energy – Selected prices and quantities in December 2019

December 2019

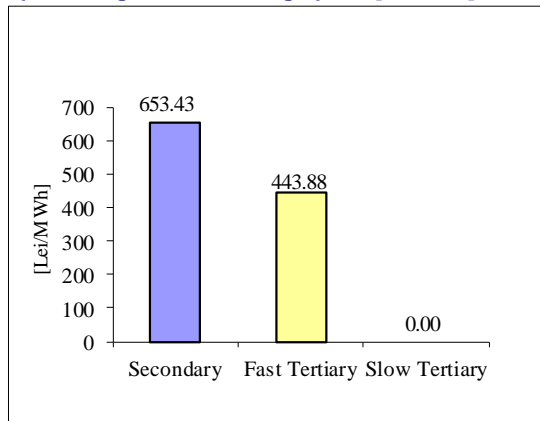
Downward regulation - average price [lei/MWh]



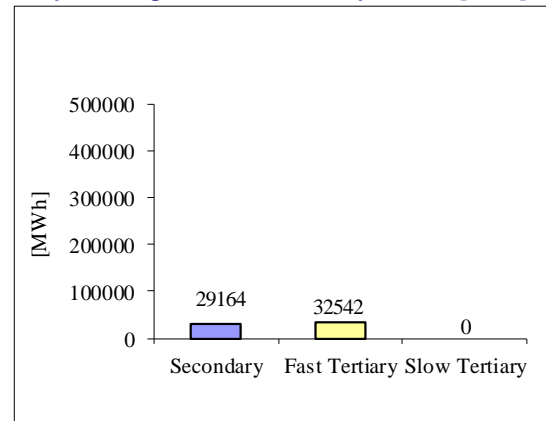
Downward regulation - selected quantities [MWh]



Upward regulation - average price [lei/MWh]



Upward regulation - selected quantities [MWh]



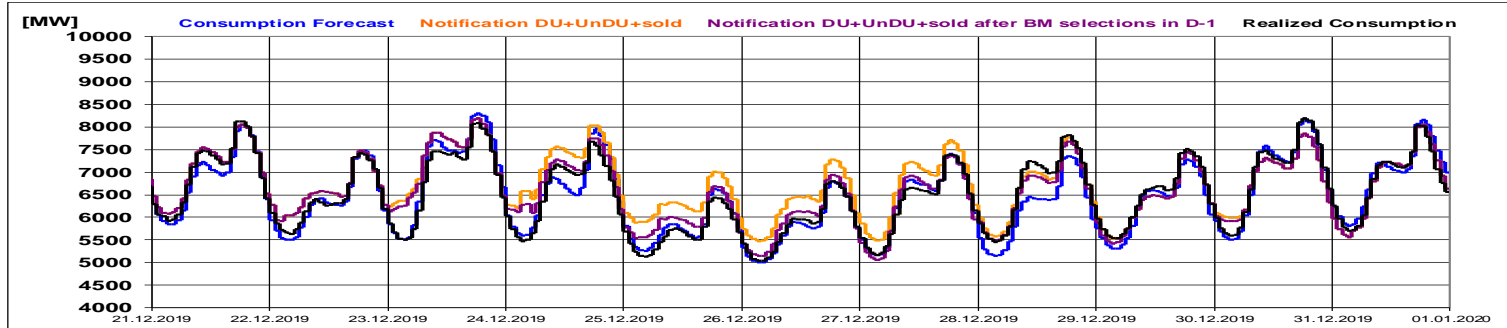
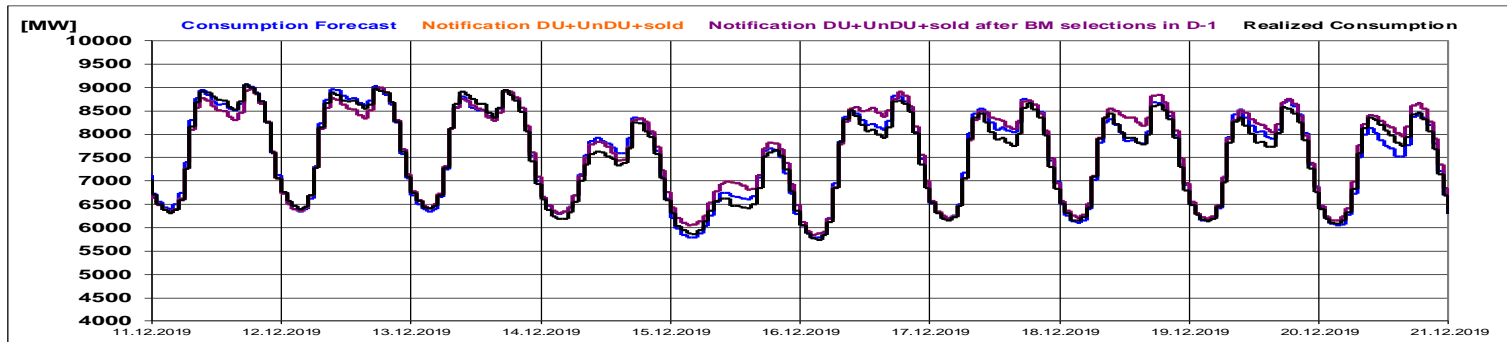
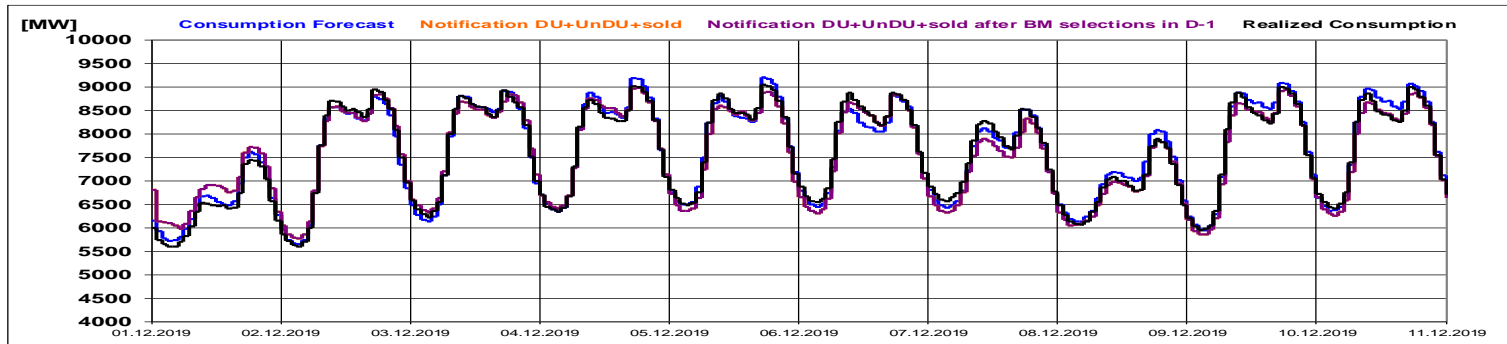


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Balancing Market

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



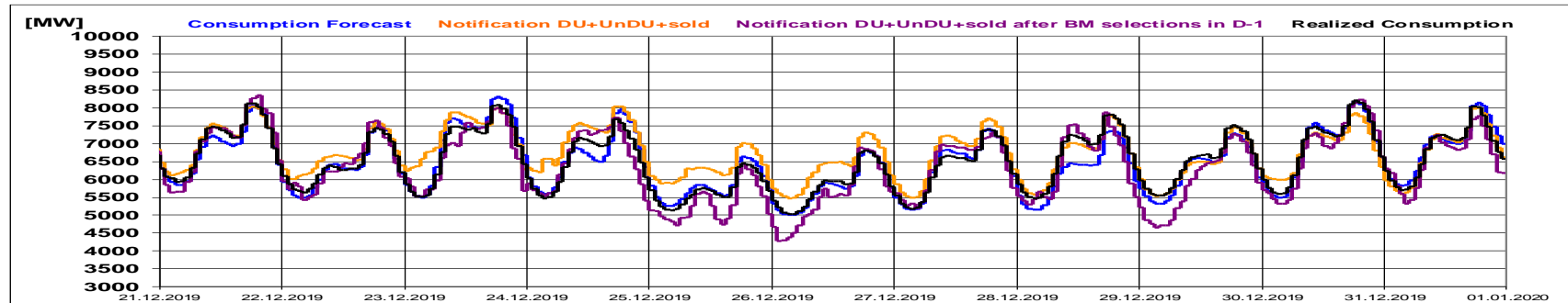
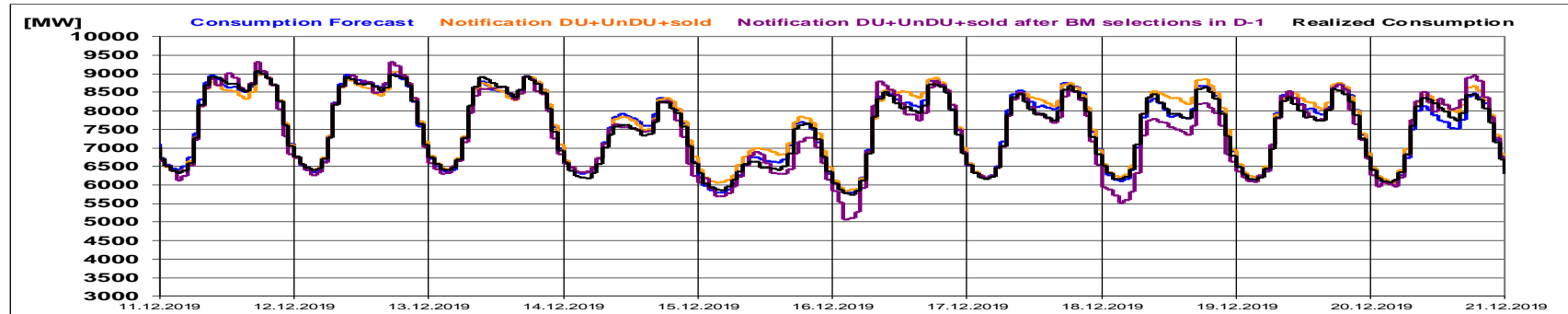
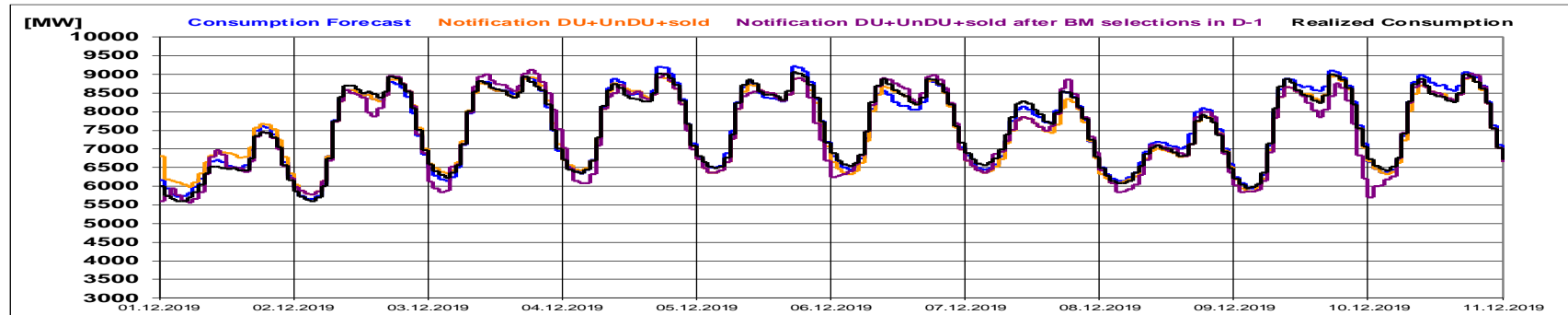


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Balancing Market

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

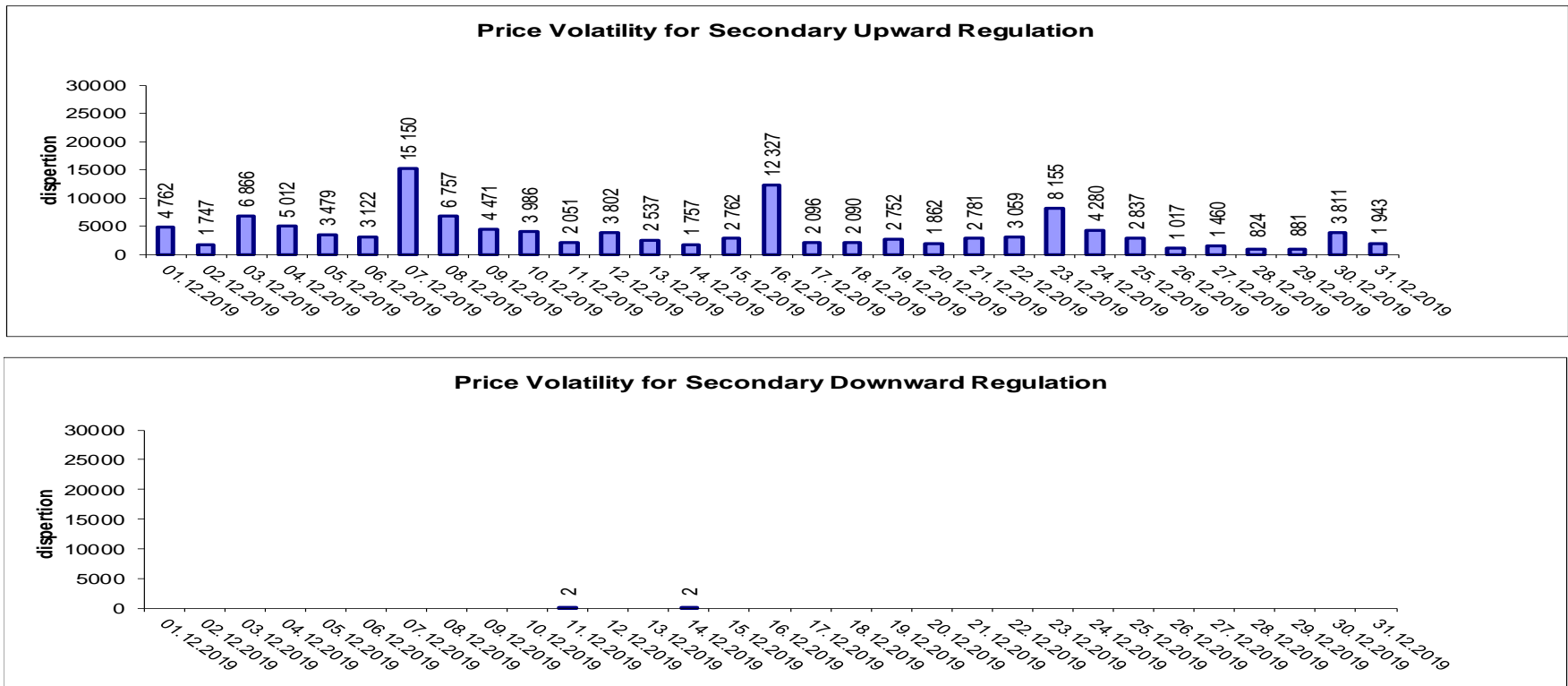




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Balancing Market

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:

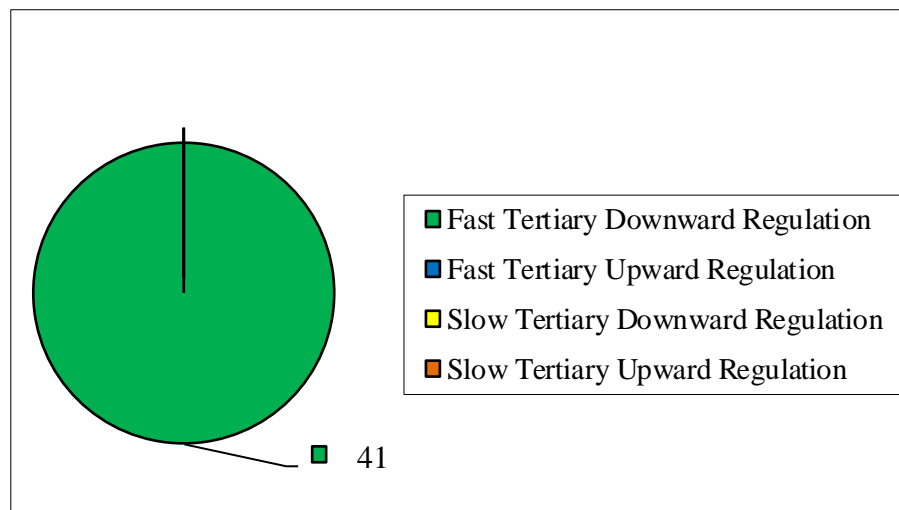
$$\frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2$$

Balancing Market

Congestion Management

	Quantities [MWh]		Participants
	<i>Selected</i>	<i>Delivered</i>	<i>Number</i>
Fast Tertiary Downward Regulation	40.59	23.58	16.00
Fast Tertiary Upward Regulation	-	-	-
Slow Tertiary Downward Regulation	-	-	-
Slow Tertiary Upward Regulation	-	-	-
	40.59	23.58	

Selected energy [MWh]



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



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