



Transelectrica®
Societate Administrată în Sistem Dualist

MARKET MONITORING REPORT

Balancing Market

January 2022

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
NRA – National Regulatory Authority

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).



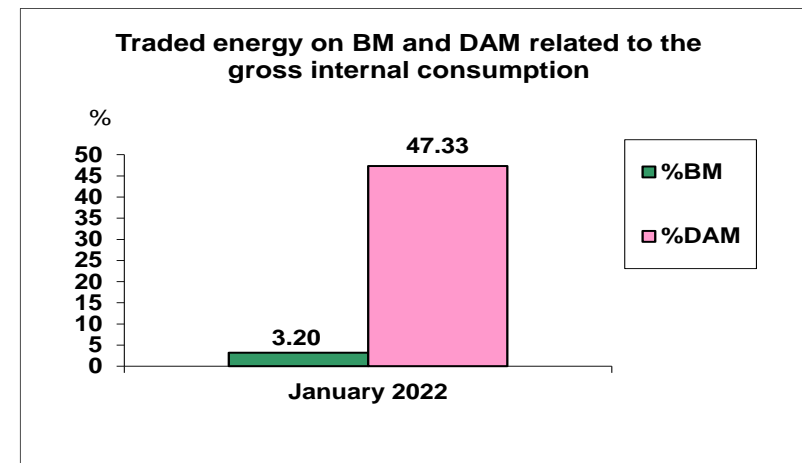
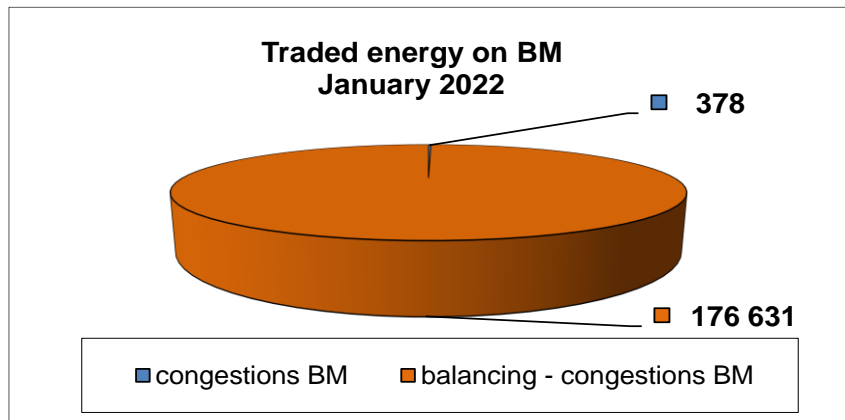
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The Balance Generation/Consumption

- The average monthly value of generated power was 7 421 MW and the actual internal gross consumption was 7 441 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being **2.16%**. 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 **2.59%**. The greatest daily deviation regarding the notifications was registered on 2nd of January (**5.8%**).
- The energy used in January 2022 for balancing the power system and congestion management was 177 009 MWh (with an average power of 238 MW, which means **3.2%** from the internal gross consumption). The energy used for congestion management was 378.3 MWh (with an average power of 0.51 MW, which means 0.0068% from the internal gross consumption).
- There were no transactions outside BM (with financial compensation).
- The energy used in January 2022 on Day Ahead Market was 2 620 446 MWh (with an average power of 3 522 MW, which means **47.33%** from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 180 209 876 lei (with an average weighted price of 1 018.08 lei/MWh. The cost of the energy paid by C.N.T.E.E. Transelectrica S.A. for congestion management was 157 055 lei.



The Balance Generation/Consumption

	Generation units commissioned in 2021	Generation units shut down in 2021
Pi [MW]	39.82	2064.15

Pi NRA license = the installed electrical power indicated in the specific conditions associated with the NRA license.

Notes:

- for the newly installed production units in 2021, both the new units and the positive power differences between the installed power according to the NRA licenses from 1st of January 2022 compared to those from 1st of January 2021 were taken into account;
- for the production units released in 2021, the units withdrawn from operation, those without an NRA production license and the negative power differences between the installed power according to the NRA licenses from 1st of January 2022 compared to those from 1st of January 2021 were taken into account.



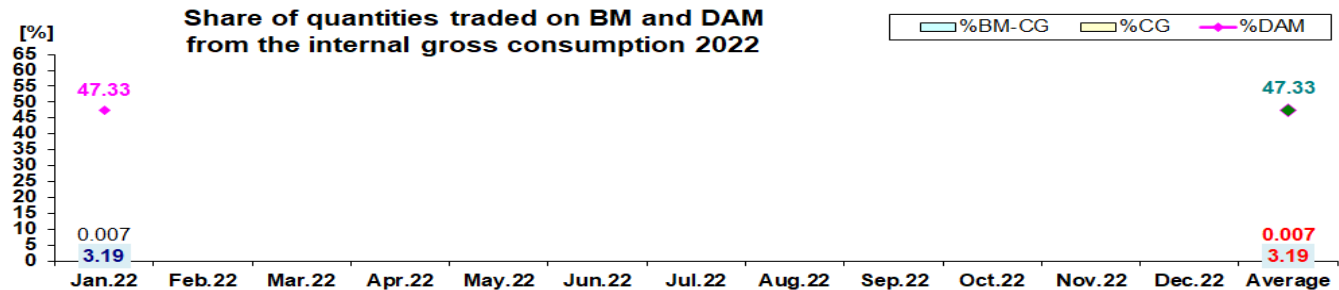
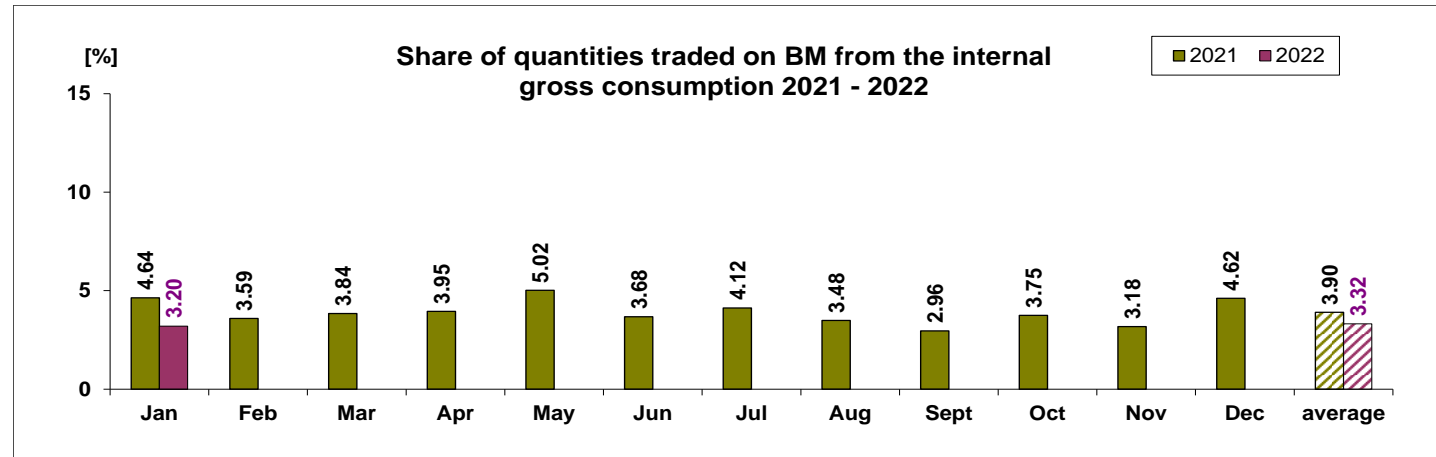
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The Balance Generation / Consumption

• Monthly percentage values resulted are calculated as ratio between traded volumes on BM / outside BM with financial compensation 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).



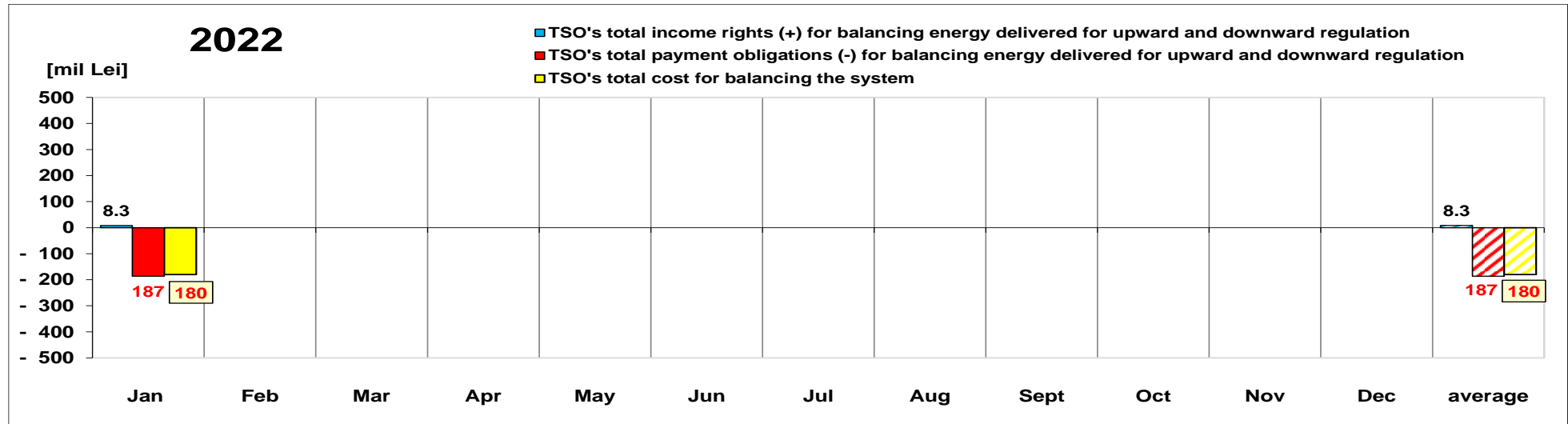
2022													
	Jan.22	Feb.22	Mar.22	Apr.22	May.22	Jun.22	Jul.22	Aug.22	Sep.22	Oct.22	Nov.22	Dec.22	Average
%BM	3.20												3.20
%DAM	47.33												47.33
%CG	0.01												0.0068
%BM-CG	3.191												3.191
% outside BM	0.00												0.00



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Balancing Energy Market Transactions



[Lei]		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	average	Sum
TSO's income rights / payment obligations for balancing energy delivered for downward regulation	incomes (+) prices ≥ 0	8 344 244	0	0	0	0	0	0	0	0	0	0	0	8 344 244	8 344 244
	payments (-) prices < 0	- 40 999	0	0	0	0	0	0	0	0	0	0	0	- 40 999	- 40 999
TSO's payment obligations / income rights for balancing energy delivered for upward regulation	payments (-) prices ≥ 0	-186 598 444	0	0	0	0	0	0	0	0	0	0	0	-186 598 444	-186 598 444
	incomes (+) prices < 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TSO's total income rights (+) for balancing		8 344 244	0	0	0	0	0	0	0	0	0	0	0	8 344 244	8 344 244
TSO's total payment obligations (-) for		-186 639 443	0	0	0	0	0	0	0	0	0	0	0	-186 639 443	-186 639 443
TSO's total cost for balancing the system		-180 209 876	0	0	0	0	0	0	0	0	0	0	0	-180 209 876	-180 209 876
Value of transactions outside BM (with		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Congestion Cost on BM		- 157 055	0	0	0	0	0	0	0	0	0	0	0	- 157 055	- 157 055
Congestion Cost outside BM		0	0	0	0	0	0	0	0	0	0	0	0	0	0

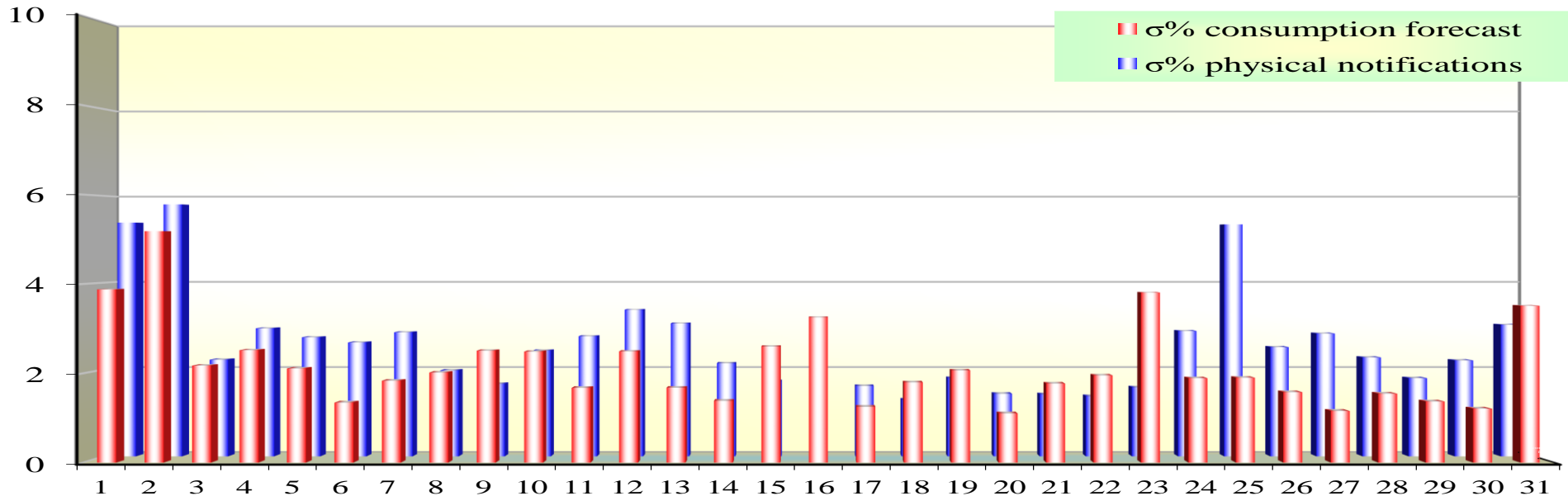
* The annual average value was obtained as arithmetic average of the monthly values.



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Balancing Market

Standard deviation of physical notifications and consumption forecast against the actual consumption in January 2022



January 2022

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	3.88	5.18	2.17	2.52	2.11	1.34	1.83	2.02	2.51	2.49	1.67	2.49	1.68	1.38	2.60	3.25	1.25	1.80	2.06	1.10	1.77	1.95	3.81	1.89	1.90	1.58	1.16	1.54	1.37	1.21	3.51
σ% physical notifications	5.38	5.80	2.23	2.95	2.74	2.62	2.86	1.98	1.67	2.44	2.77	3.38	3.06	2.14	1.73	3.16	1.62	1.31	1.81	1.44	1.43	1.39	1.59	2.89	5.34	2.52	2.83	2.28	1.80	2.21	3.03

σ_{average% consumption forecast} = 2.16

σ_{average % physical notifications} = 2.59

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

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

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, 95 market participants, holding 188 commercially operating dispatchable units. Starting with the 1st of January 2022, the groups TA2, TA3, TA4, TA5 and TA6 CTE Mintia, belonging to CE HUNEDOARA, were permanently withdrawn from commercial exploitation, in accordance with NRA Decision no. 2391/29.12.2021. Also, starting with the 6th of January 2022, PROG2 production unit belonging to BMP Electrocentrale Bucuresti S.A. (30XROELCEN----D) was removed from the DU list.

January 2022

Downward Regulation

	Prices			Quantities			Participants					
	Weighted Average	Maximum	Minimum	Selected	Actually Delivered	Deviation	C1	C3	C1	C3	HHI	HHI
	[lei/MWh]	[lei/MWh]	[lei/MWh]	[MWh]	[MWh]	[%]	Number	(selected)	(actually delivered)	(selected)	(selected)	(actually delivered)
Secondary	0.09	0.10	-10.00	42326.65	42326.65	0.00%	3	71.26%	100%	71.26%	100%	5557
Fast Tertiary	155.76	300.00	0.10	56211.52	52912.81	5.87%	9	49.51%	92.06%	49.25%	92.3%	3815
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-
				98538.17	95239.46	3.35%						

Upward Regulation

	Prices			Quantities			Participants					
	Weighted Average	Maximum	Minimum	Selected	Actually Delivered	Deviation	C1	C3	C1	C3	HHI	HHI
	[lei/MWh]	[lei/MWh]	[lei/MWh]	[MWh]	[MWh]	[%]	Number	(selected)	(actually delivered)	(selected)	(selected)	(actually delivered)
Secondary	3183.96	5000.00	1000.00	30885.38	30885.38	0.00%	3	71.15%	100%	71.15%	100%	5535
Fast Tertiary	1733.89	2425.30	600.00	51550.62	50884.11	1.29%	7	84.38%	92.77%	84.54%	92.77%	7172
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-
				82436.00	81769.50	0.81%						



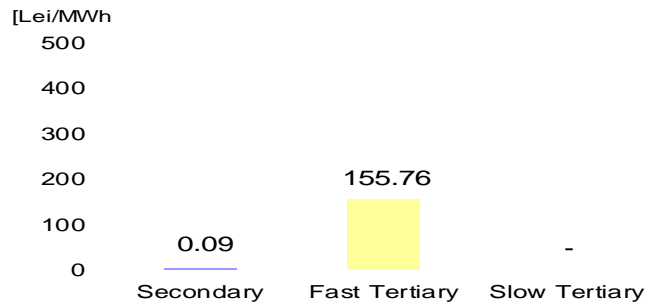
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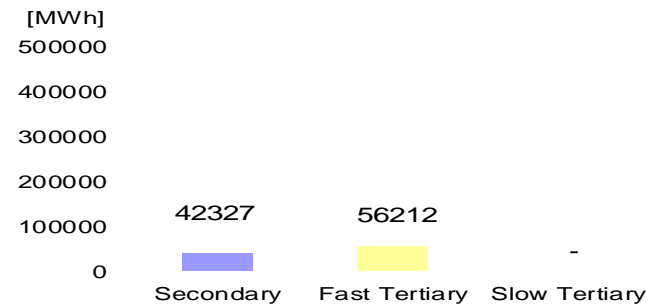
Balancing energy – Selected prices and quantities in January 2022

January 2022

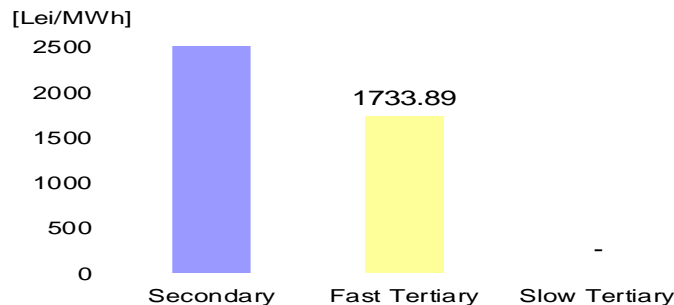
Downward regulation - average price [lei/MWh]



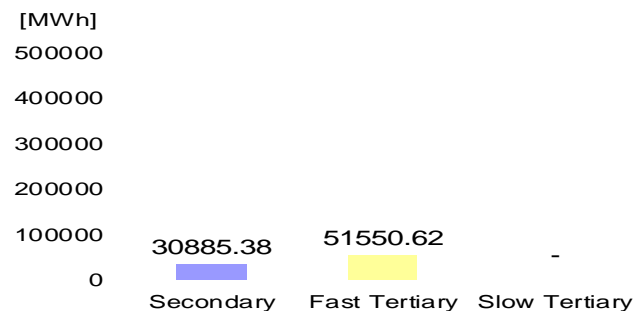
Downward regulation - selected quantities



Upward regulation - average price [lei/MWh]



Upward regulation - selected quantities



$$\text{Price}_{\text{average weighted, regulation type, direction}} = \frac{\sum (Q_{i,j} * P_{i,j})}{\sum Q_{i,j}},$$

where $Q_{i,j}$, $P_{i,j}$ represents the quantity, respectively the price of the energy selected, corresponding to the selected transaction j in the dispatching interval i .

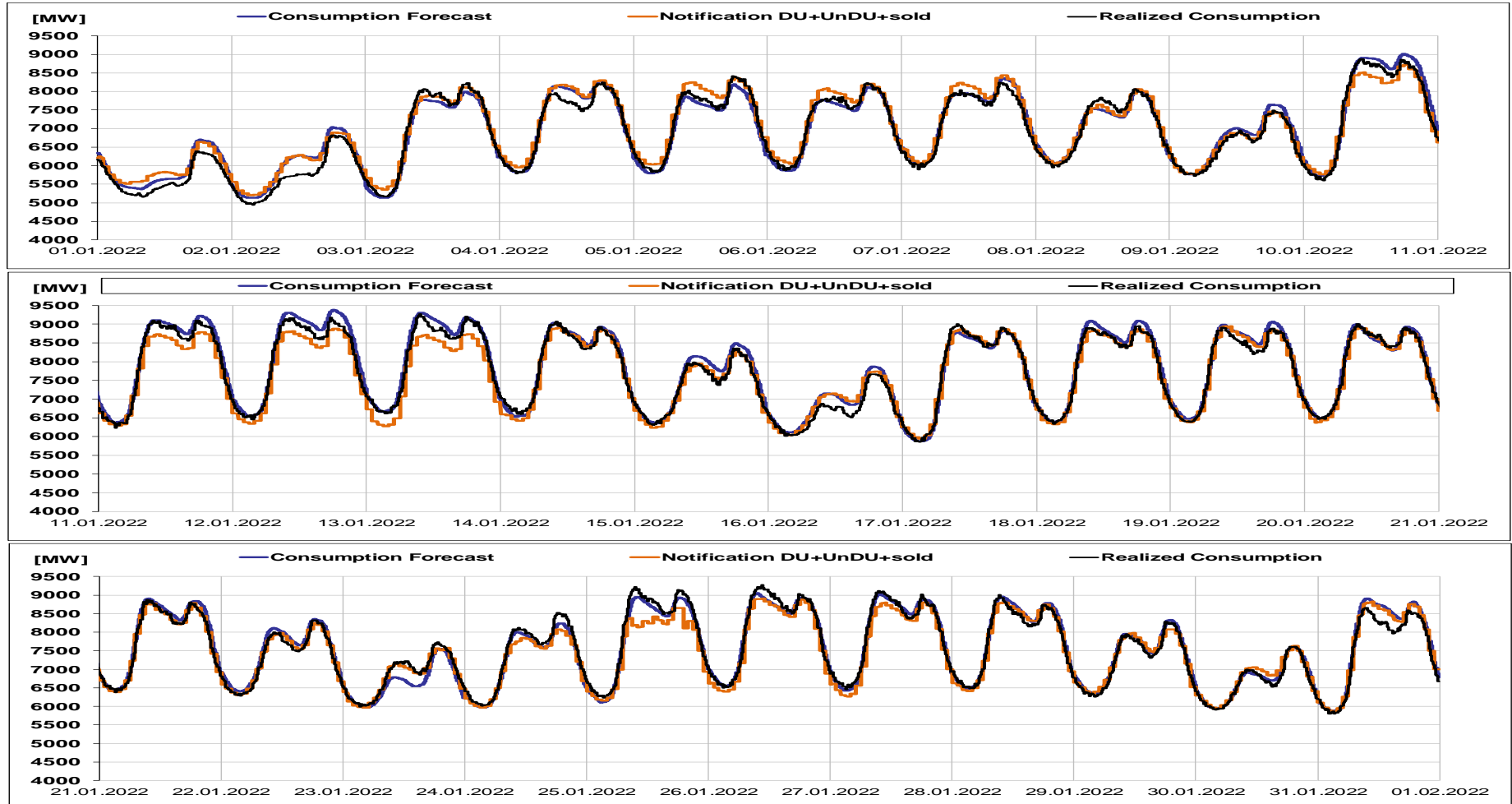


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Realized consumption, forecast, notifications in D-1



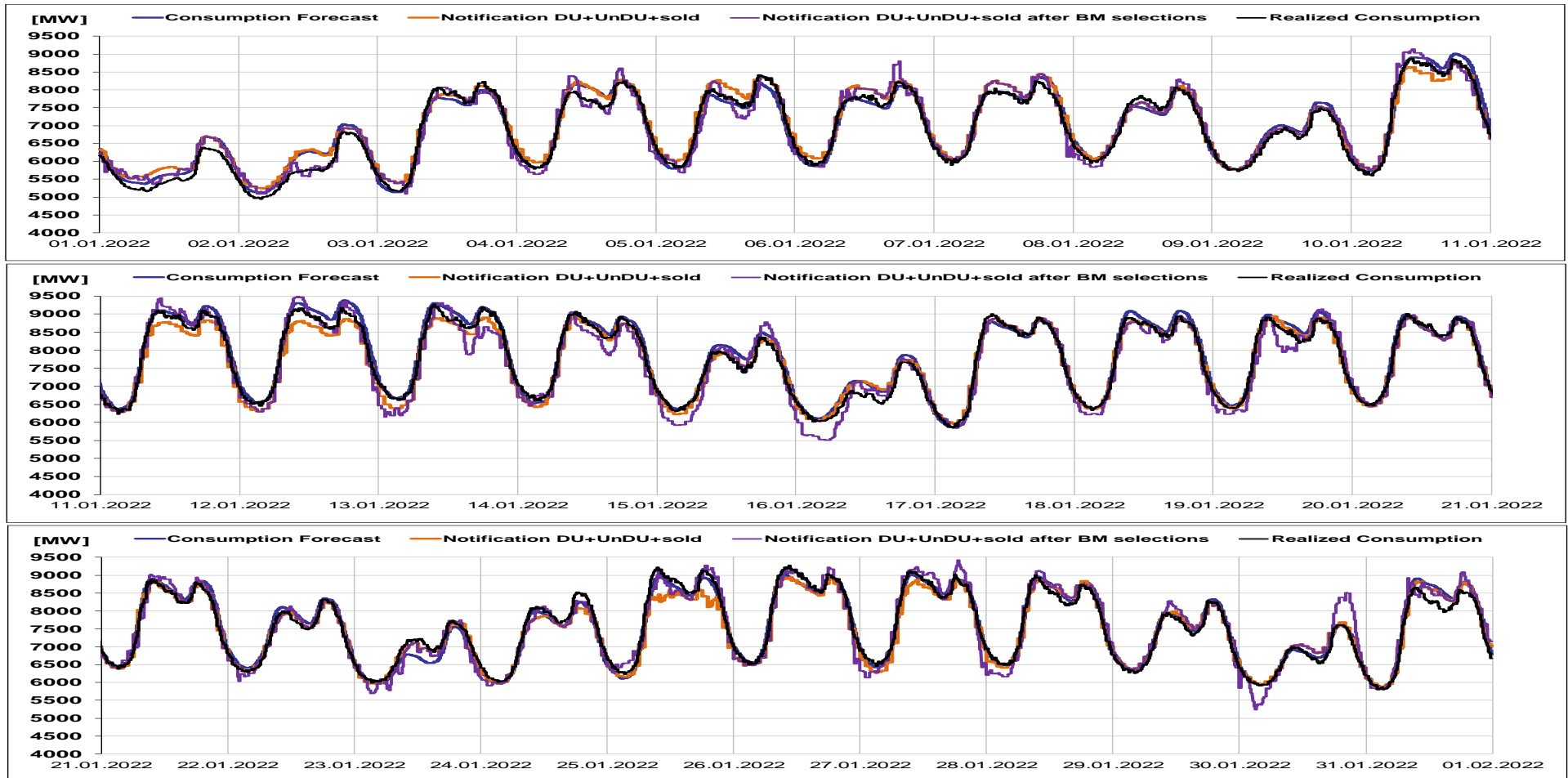


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Balancing Market

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



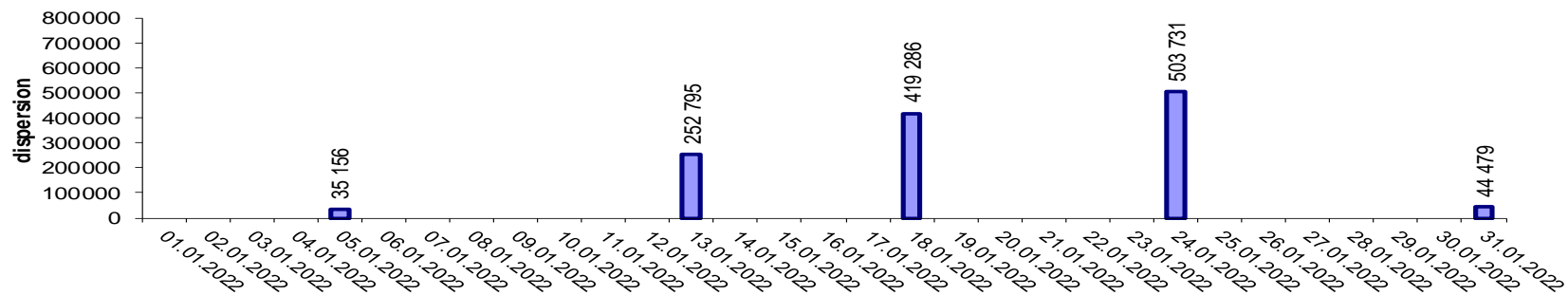


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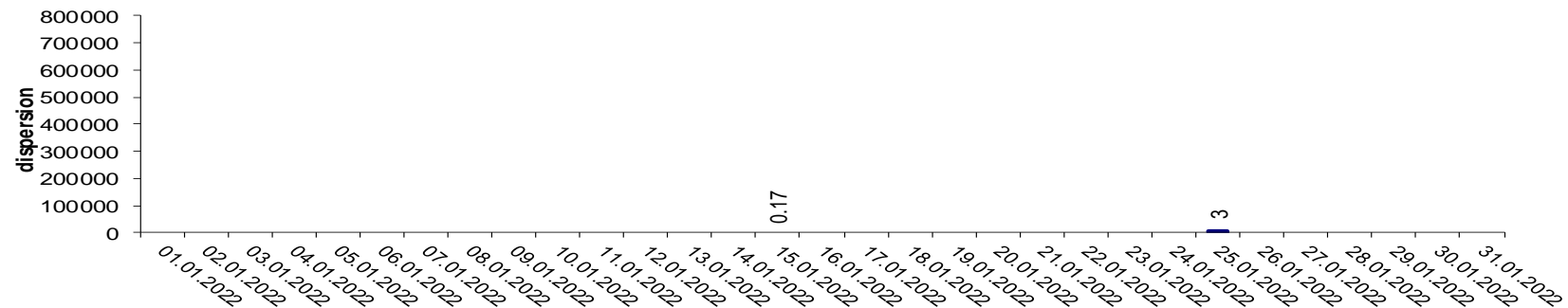
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Indicators – Price Volatility for Secondary Regulation

Price Volatility for Secondary Upward Regulation



Price Volatility for Secondary Downward Regulation



Volatility = price dispersion on studied interval:

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

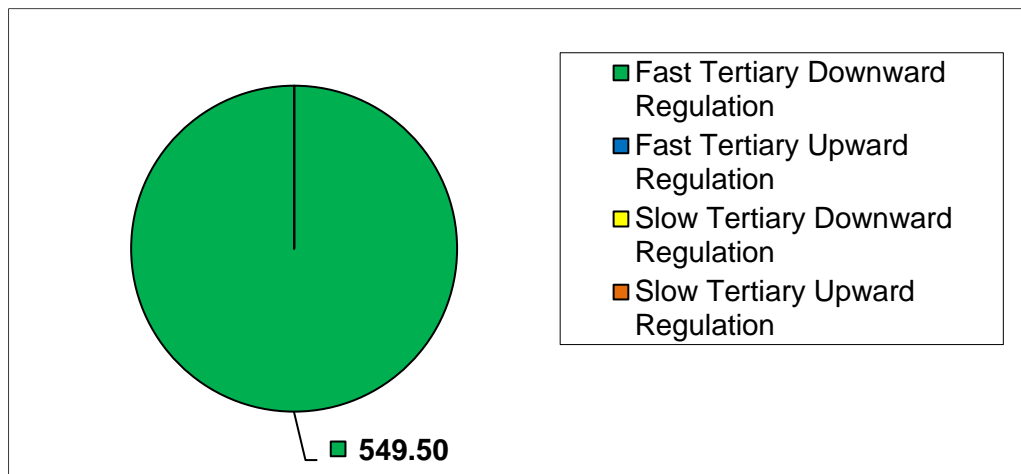
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Congestion Management

January 2022

Fast Tertiary Downward
Regulation
Fast Tertiary Upward Regulation
Slow Tertiary Downward
Regulation
Slow Tertiary Upward Regulation

	Quantities [MWh]		Participants
	Selected [MWh]	Actually Delivered	Number
Fast Tertiary Downward Regulation	549.50	378.30	3
Fast Tertiary Upward Regulation	0.00	-	0
Slow Tertiary Downward Regulation	0.00	-	0
Slow Tertiary Upward Regulation	0.00	-	0
	549.50	378.30	



The value of the delivered energy related to the final transactions for the management of internal congestions is the one resulting from the application of the algorithm for determining the costs for system balancing and for management of internal congestions from the settlement stage on the BM.



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