



Transelectrica®
Societate Administrată în Sistem Dualist

MARKET MONITORING REPORT

Balancing Market

August 2021

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).



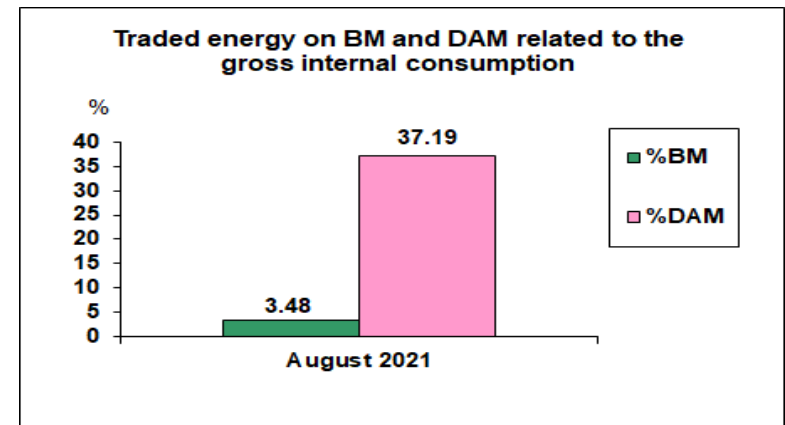
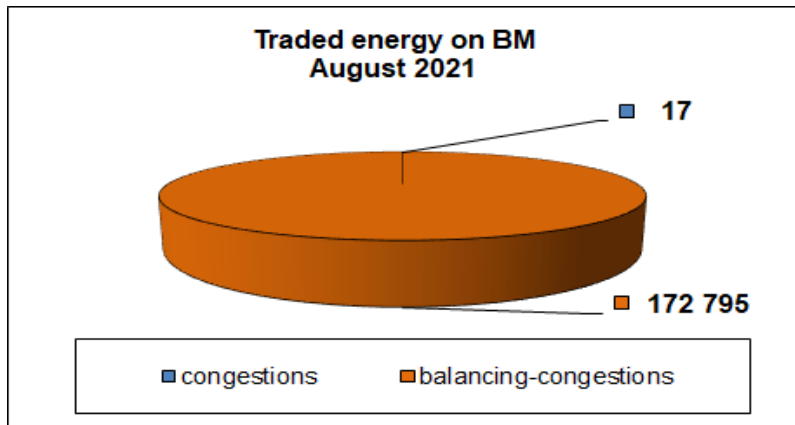
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The Balance Generation/Consumption

- The average monthly value of generated power was 5 981 MW and the actual internal gross consumption was 6 665 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being **1.86%**. 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 **3.07%**. The greatest daily deviation regarding the notifications was registered on 30th of August 2021 (**6.10%**).
- The energy used in August 2021 for balancing the power system and congestion management was 172 811 MWh (with an average power of 232 MW, which means **3.48%** from the internal gross consumption). The energy used for congestion management was 16.75 MWh (with an average power of 0.02 MW, which means 0.0003% from the internal gross consumption).
- There were no transactions outside BM (with financial compensation).
- The energy used in August 2021 on Day Ahead Market was 1 844 071 MWh (with an average power of 2 479 MW, which means **37.19%** from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 100 540 915 lei (with an average weighted price of 581.8 lei/MWh. The cost of the energy paid by C.N.T.E.E. Transelectrica S.A. for congestion management was 178 lei.





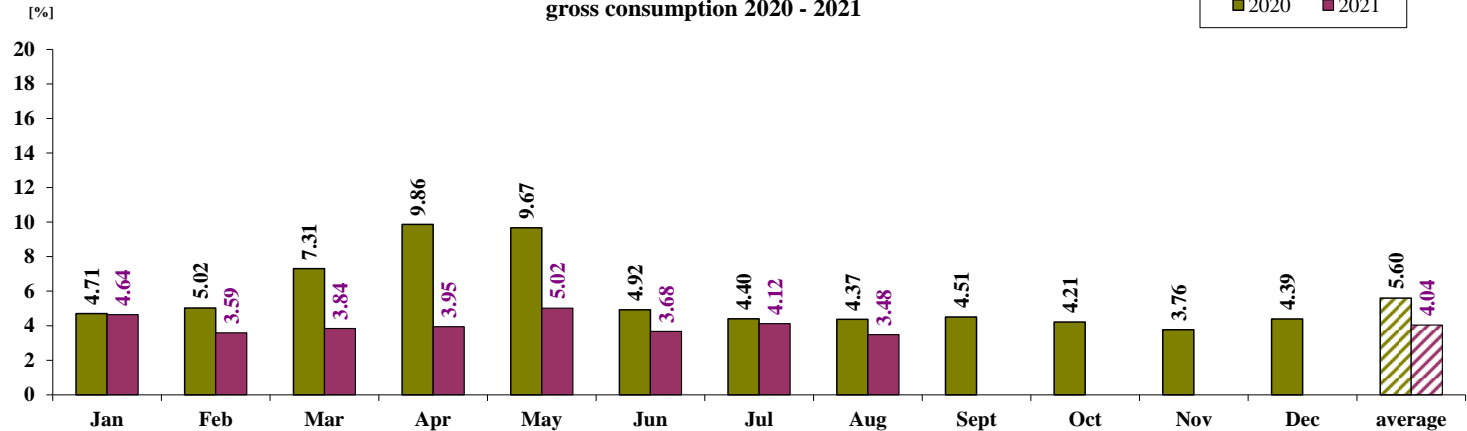
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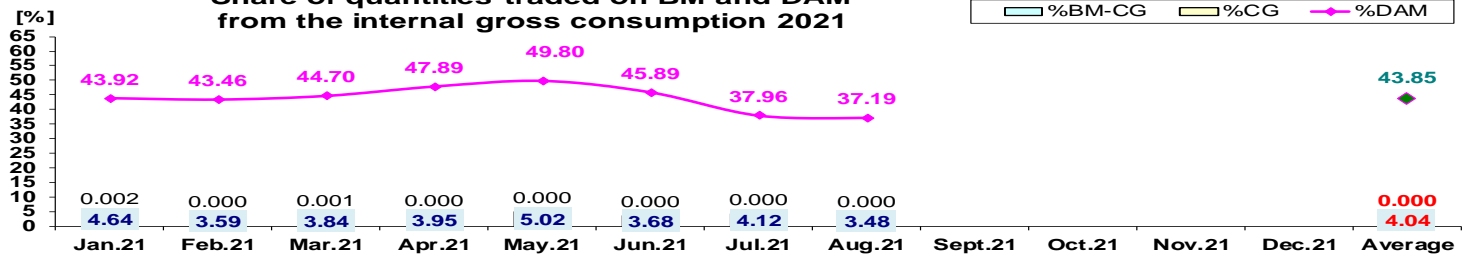
The Balance Generation / Consumption

• 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).

Share of quantities traded on BM from the internal gross consumption 2020 - 2021



Share of quantities traded on BM and DAM from the internal gross consumption 2021



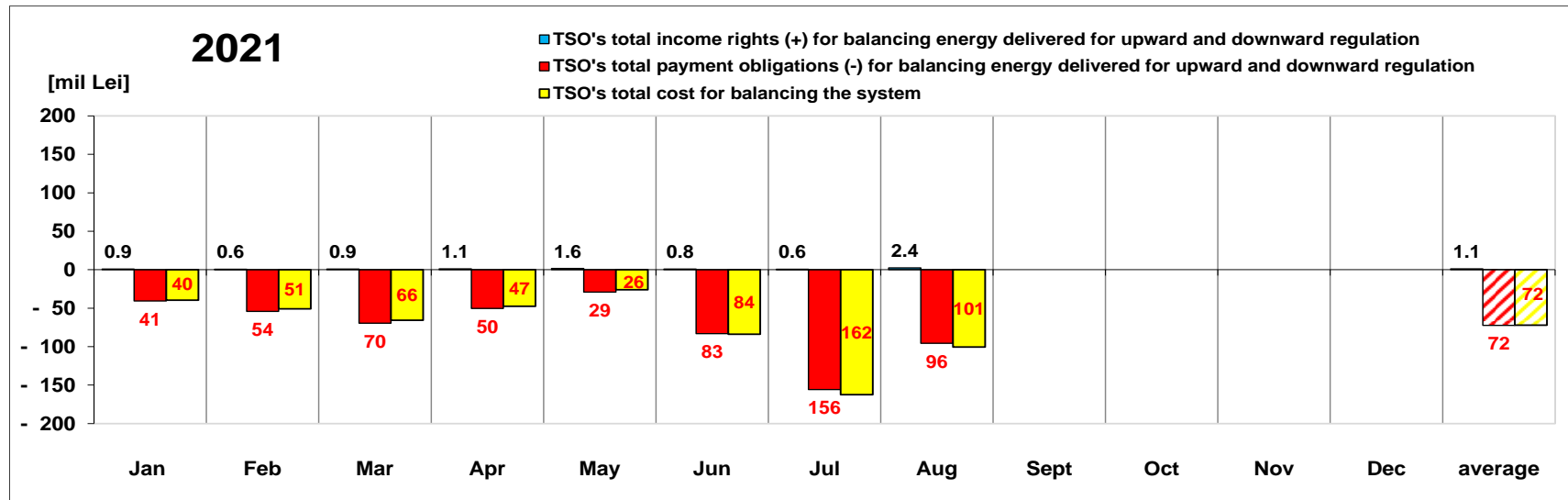
	2021												
	Jan.21	Feb.21	Mar.21	Apr.21	May.21	Jun.21	Jul.21	Aug.21	Sept.21	Oct.21	Nov.21	Dec.21	Average
%BM	4.64	3.59	3.84	3.95	5.02	3.68	4.12	3.48					4.04
%DAM	43.92	43.46	44.70	47.89	49.80	45.89	37.96	37.19					43.85
%CG	0.002	0.000	0.001	0.000	0.000	0.000	0.000	0.0003					0.0004
%BM-CG	4.636	3.592	3.836	3.947	5.019	3.675	4.122	3.485					4.039
% outside BM	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00					0.002



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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	878 222	633 581	912 692	1 127 724	1 558 592	805 841	648 010	2 432 702					1 124 671	8 997 365
	payments (-) prices < 0	- 367 742	- 8 158	- 280 354	- 849 859	0	- 295 584	- 340 681	- 65 874					- 276 031	- 2 208 252
TSO's payment obligations / income rights for balancing energy delivered for upward regulation	payments (-) prices ≥ 0	-40 134 420	-54 045 144	-69 270 145	-49 547 577	-29 085 259	-82 840 786	-155 567 405	-95 476 521					-71 995 907	- 575 967 257
	incomes (+) prices < 0	0	0	0	0	0	0	0	0					0	0
TSO's total income rights (+) for balancing		878 222	633 581	912 692	1 127 724	1 558 592	805 841	648 010	2 432 702					1 124 671	8 997 365
TSO's total payment obligations (-) for		-40 502 162	-54 053 301	-69 550 500	-50 397 436	-29 085 259	-83 136 370	-155 908 086	-95 542 395					-72 271 939	- 578 175 509
TSO's total cost for balancing the system		-39 649 686	-50 861 284	-65 692 590	-47 412 381	-26 133 778	-83 889 171	-162 448 175	-100 539 890					-72 078 369	- 576 626 954
Value of transactions outside BM (with financial compensation)		- 25 803	0	0	0	0	0	0	0					- 3 225	- 25 803
Congestion Cost on BM		- 56	0	- 121	0	0	0	0	- 178					- 44	- 355
Congestion Cost outside BM		0	0	0	0	0	0	0	0					0	0

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

Public

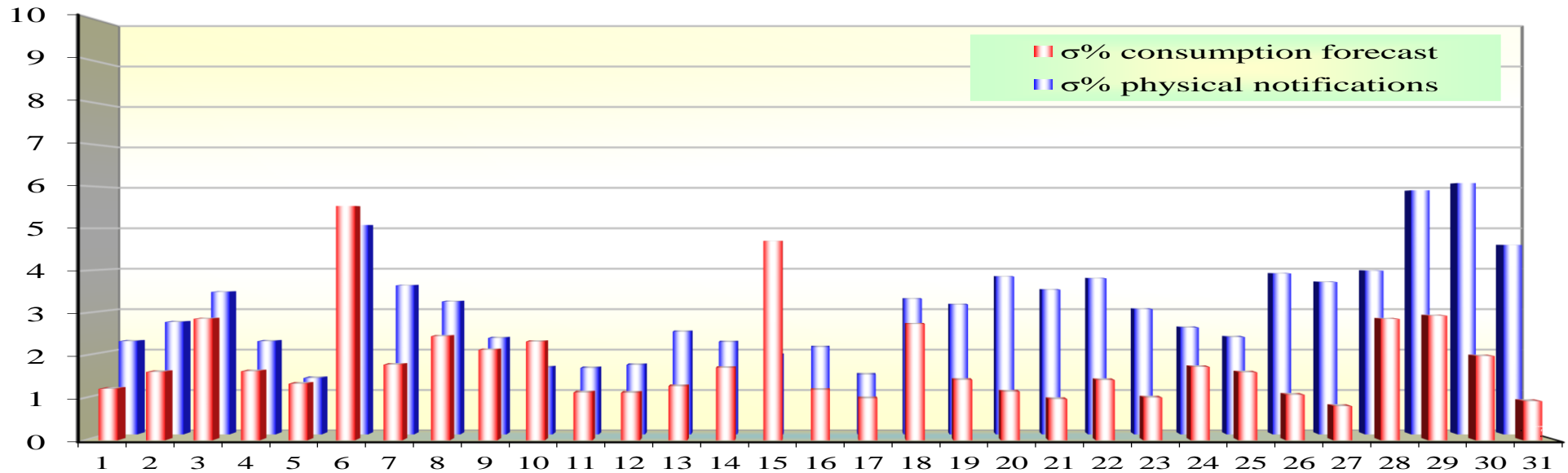


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Balancing Market

Standard deviation of physical notifications and consumption forecast against the actual consumption in August 2021



Aug 2021

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	1.21	1.61	2.87	1.63	1.33	5.53	1.78	2.45	2.13	2.33	1.13	1.12	1.28	1.71	4.70	1.19	0.99	2.74	1.43	1.15	0.97	1.42	1.01	1.73	1.60	1.07	0.80	2.86	2.94	1.99	0.92
σ% physical notifications	2.26	2.73	3.46	2.26	1.37	5.08	3.61	3.22	2.34	1.63	1.61	1.69	2.49	2.24	1.93	2.12	1.45	3.29	3.15	3.83	3.51	3.78	3.04	2.59	2.36	3.90	3.70	3.97	5.92	6.10	4.60

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

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

σ_{average% consumption forecast} = 1.86

σ_{average % physical notifications} = 3.07

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 72 BRPs, 98 market participants, holding 190 commercially operating dispatchable units. Starting with 1st of August 2021, according to the provisions of ANRE Order no. 213/2020, amended and supplemented by ANRE Order no. 33/2021, BRP GENESIS BIOTECH (TESTS) (30XRO-GBTPROBE-D) was registered in the Balancing Market, having as production unit during the trial period GENESIS2.

August 2021

Downward Regulation

Downward Regulation	Prices [lei/MWh]			Quantities [MWh]			Participants						
	Weighted Average	Maximum	Minimum	Selected	Actually Delivered	Deviation	Number	C1	C3	C1	C3	HHI	HHI
Secondary	0.07	0.10	-10.00	47416.99	47416.99	0.00%	4	61.74%	99.94%	61.74%	99.94%	4554	4554
Fast Tertiary	58.40	105.00	-100.00	42924.15	40516.19	5.61%	6	52.58%	96.29%	51.63%	96.42%	3732	3679
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-	-
				90341.14	87933.19	2.67%							

Upward Regulation

	Weighted Average	Maximum	Minimum	Selected	Actually Delivered	Deviation	Number	C1	C3	C1	C3	HHI	HHI
	[lei/MWh]	[lei/MWh]	[lei/MWh]	[MWh]	[MWh]	[%]		(selected)		(actually delivered)		(selected)	(actually delivered)
Secondary	1155.92	1503.00	582.14	33714.29	33714.29	0.00%	4	63.55%	99.93%	63.55%	99.93%	4763	4763
Fast Tertiary	1104.02	1500.00	598.35	53301.95	51164.01	4.01%	6	63.13%	94.27%	63.99%	94.19%	4547	4613
Slow Tertiary	-	-	-	0.00	-	-	0	-	-	-	-	-	-
				87016.23	84878.30	2.46%							



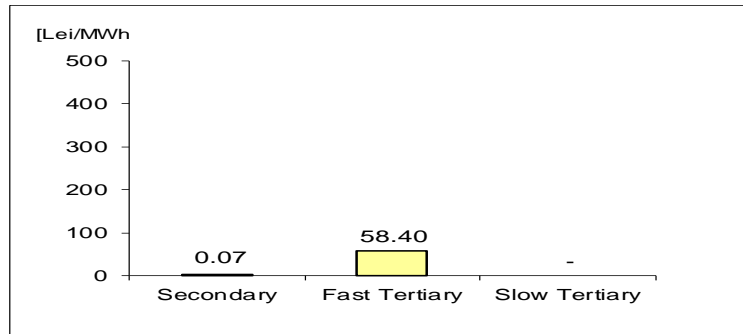
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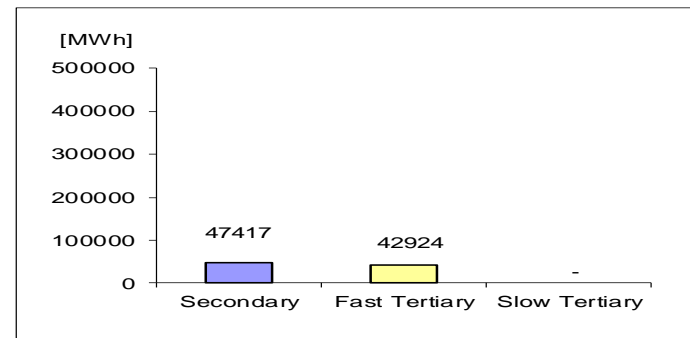
Balancing energy – Selected prices and quantities in August 2021

August 2021

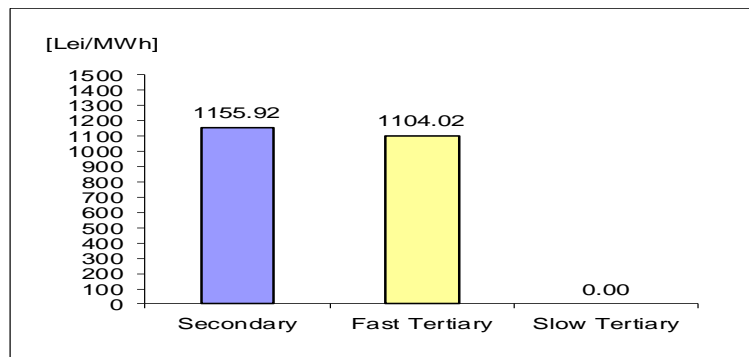
Downward regulation - average price [lei/MWh]



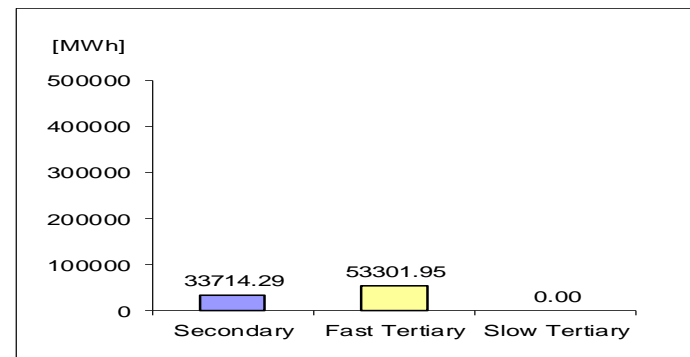
Downward regulation - selected quantities [MWh]



Upward regulation - average price [lei/MWh]



Upward regulation - selected quantities [MWh]



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

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 .

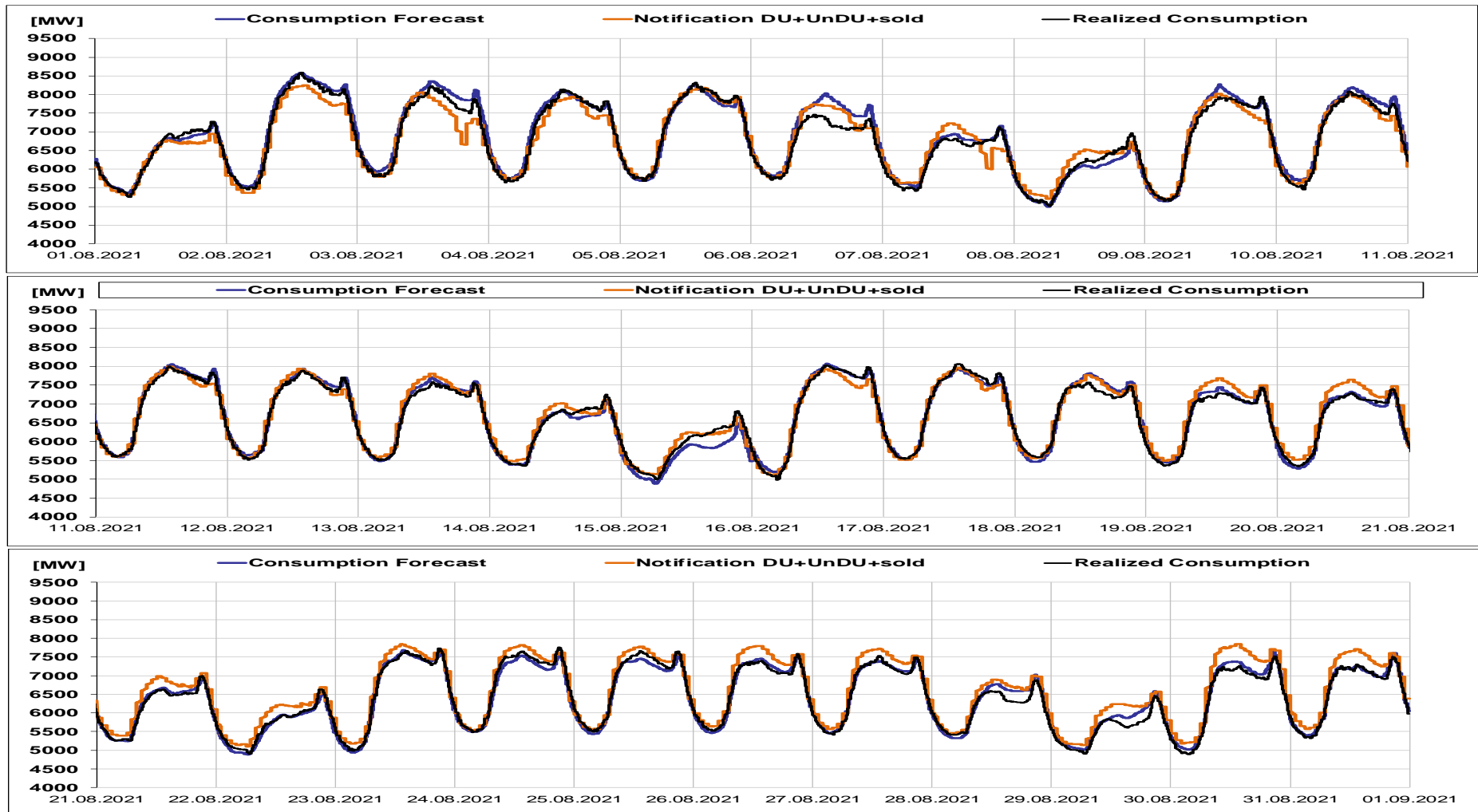


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Realized consumption, forecast, notifications in D-1



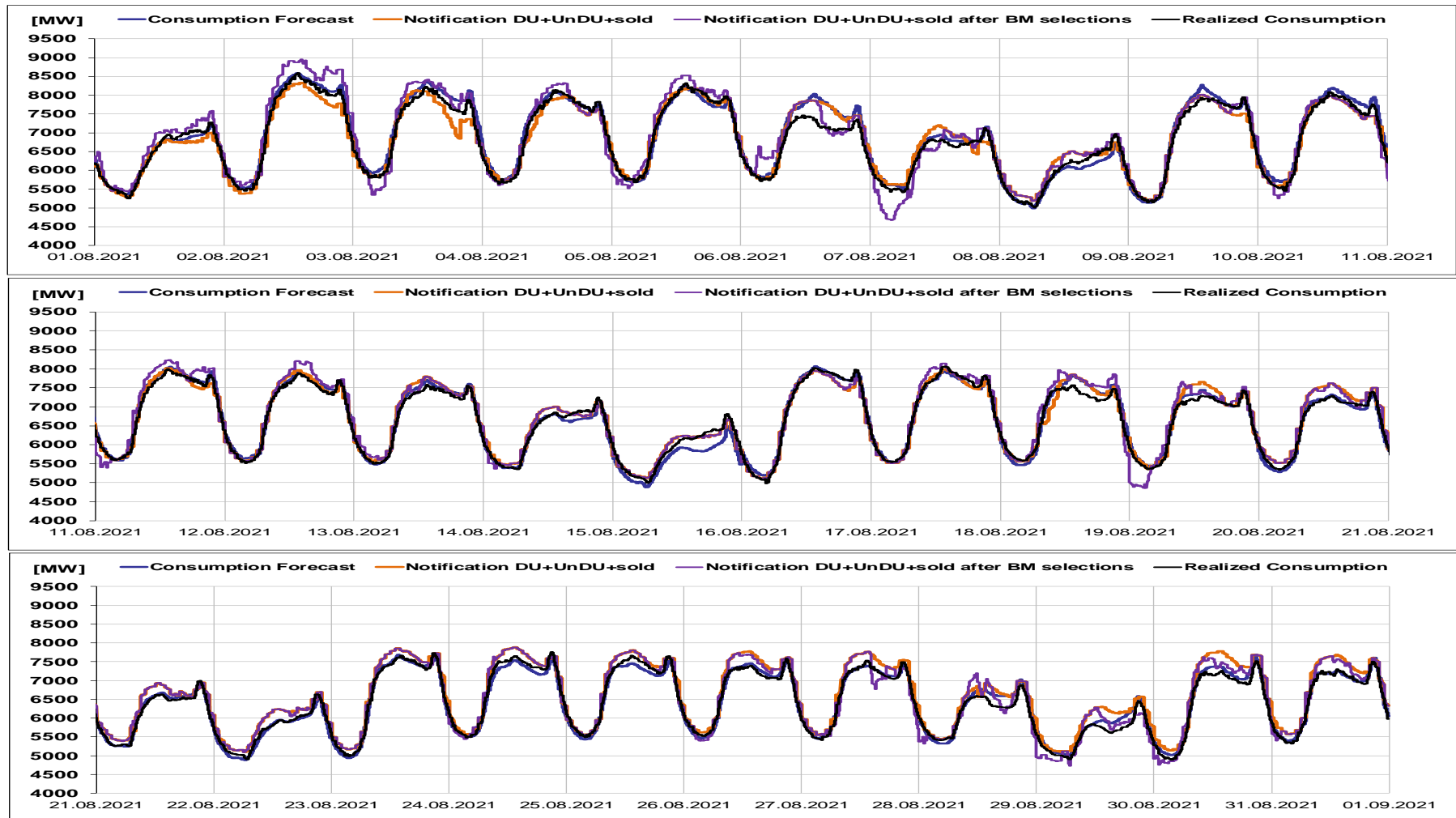


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Balancing Market

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

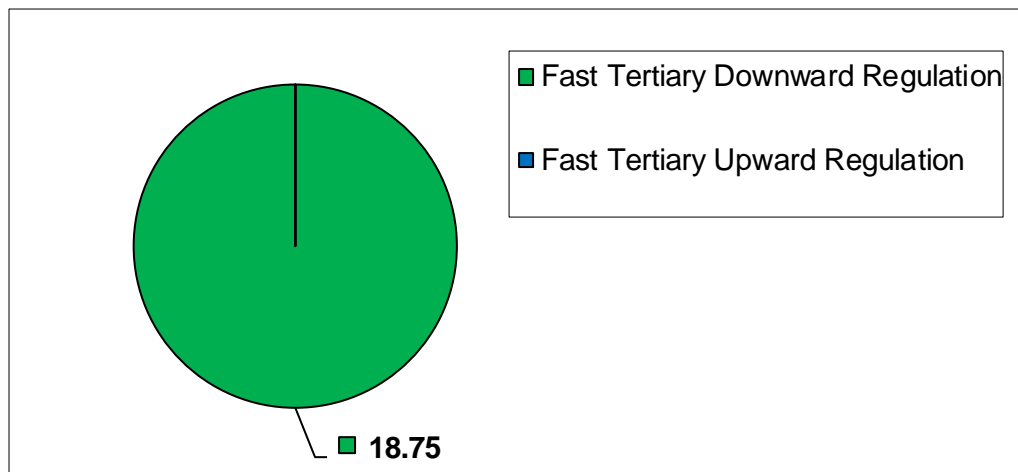


Balancing Market

Congestion Management

	Quantities [MWh]		Participants
	<i>Selected</i> [MWh]	<i>Actually Delivered</i>	<i>Number</i>
Fast Tertiary Downward Regulation	18.75	16.75	1
Fast Tertiary Upward Regulation	0.00	-	0
Slow Tertiary Downward Regulation	0.00	-	0
Slow Tertiary Upward Regulation	0.00	-	0
	18.75	16.75	

Selected energy [MWh]



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.



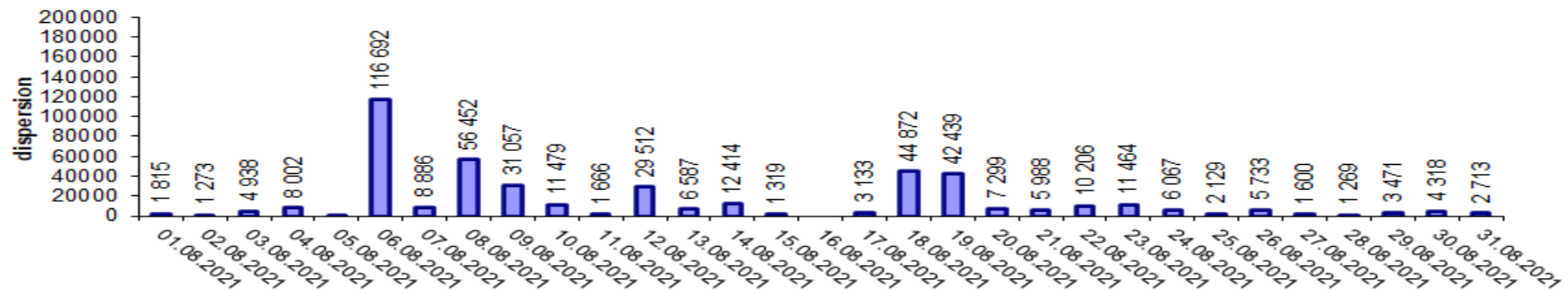
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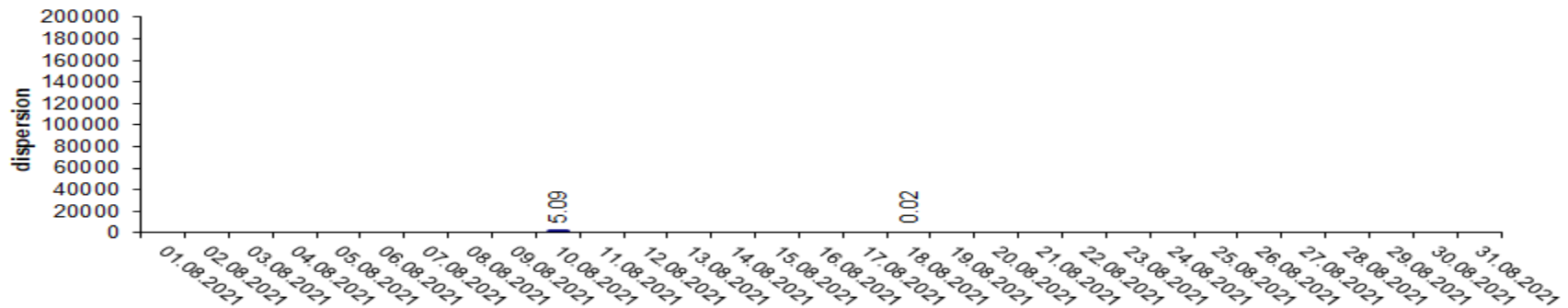
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Indicators – Price Volatility for Secondary Regulation

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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