



**Transelectrica®**  
Societate Administrată în Sistem Dualist

# **MARKET MONITORING REPORT**

## **Balancing Market**

### **January 2023**

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

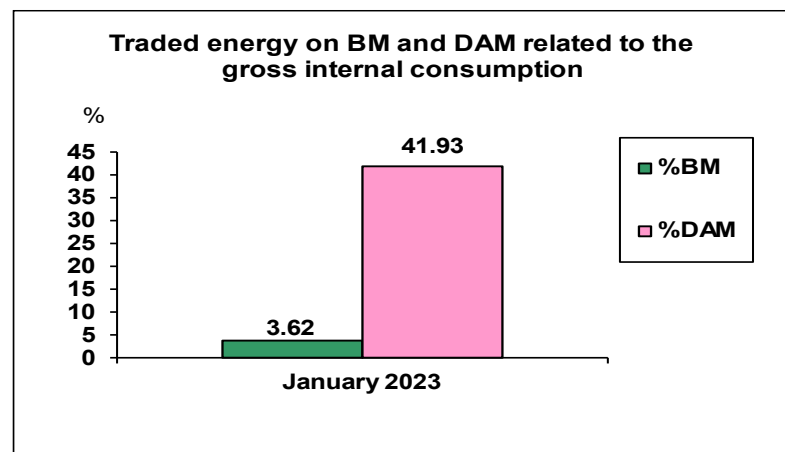
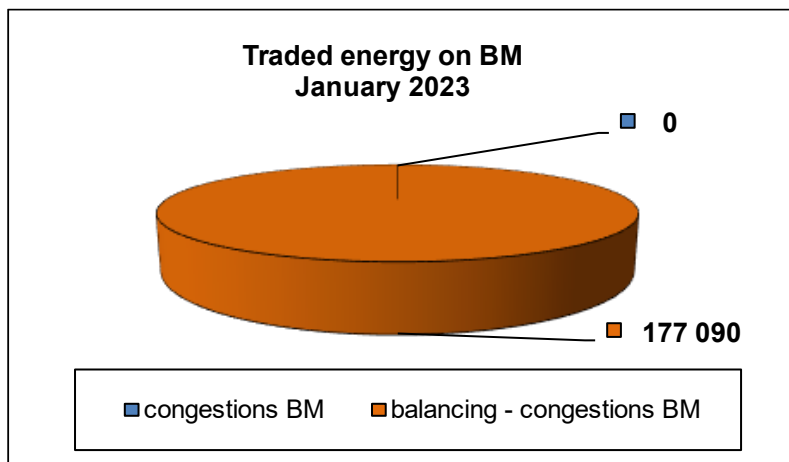
According to the Commercial Code, Transelectrica, the Romanian Transmission System Operator, operates and monitors the activity of 3 types of markets: Balancing Market, Ancillary Services Market and Market for Allocation of Cross-Border Capacities.

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](http://www.transelectrica.ro) (section Transparency).

- At the beginning of the month on the Balancing Market operated 73 BRPs, 89 market participants, holding 177 commercially operating dispatchable units. According to NRA Order no 213/2020, with subsequent amendments and completions, the following modifications were made during the month:
    - were registered in the BM during the probationary period, the following BRPs:
      - ✓ GREEN FOTOVOLTAIC PARC (PROBE) (30XROGREENFOTO-F) (15<sup>th</sup> of January), as a result of the start of the trial period for the solar production unit GREENFOTO\_PROBE;
      - ✓ EOLIENE VERZI (PROBE) (30XROEOLIENEVER3) (20<sup>th</sup> of January), as a result of the start of the trial period for the wind production unit EOLVERZI\_P;
      - ✓ CAVIGNON (PROBE) (30XROCAVIGNON--X) (23<sup>rd</sup> of January), as a result of the start of the trial period for the solar production unit CAVIG;
      - ✓ SUN CHALLENGE (PROBE) (30XROSUNCHALLP-F) (27<sup>th</sup> of January), as a result of the start of the trial period for the solar production unit CALUGARENI.
    - starting with 1<sup>st</sup> of January 2023, the following BRPs were permanently withdrawn from BM:
      - ✓ BRP MEGALODON STORAGE (PROBE) (30XROMEALODON-K), as a result of the termination of the trial period at the MEGALODON storage unit, which is registered in the balancing market platform as a non-dispatchable storage unit, within BRP CINTAENERGY (30XROCINTAEN---N);
      - ✓ BRP CTPARK PHI (PROBE) (30XROCTPARKPHI-C), as a result of the termination of the trial period at the solar production unit CTPARK\_P.
- During the month, the next non-dispatchable production units were registered in the balancing market platform:
- ✓ RESTARTBIO; RESTARTEOLIAN; RESTARTGAZ; RESTARTHIDRO; RESTARTSOLAR (1<sup>st</sup> of January), within BRP RESTART ENERGY TRADING (30XRORESTARTENGN);
  - ✓ BRAZ8 (18<sup>th</sup> of January), within BRP TERMO PLOIESTI (60X000000000132H).

## The Balance Generation/Consumption

- The average monthly value of generated power was 7 520 MW and the actual internal gross consumption was 6 576 MW.
- The NDC consumption forecast was close to the actual consumption, the standard deviation being **2.03%**. 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 **5.25%**. The greatest daily deviation regarding the notifications was registered on 1<sup>st</sup> of January (**14.13%**).
- The energy used in January 2023 for balancing the power system and congestion management was 177 090 MWh (with an average power of 238 MW, which means **3.62%** from the internal gross consumption).
- There was no energy used for congestion management, nor for transactions outside BM (with financial compensation).
- The energy used in January 2023 on Day Ahead Market was de 2 051 624 MWh (with an average power of 2 758 MW, which means **41.93%** from the internal gross consumption). Data are shown in EET hours.
- The total cost of the energy traded on the Balancing Market was 78 018 832 lei (with an average weighted price of 440,56 lei/MWh).



## The Balance Generation/Consumption

|         | Generation units commissioned in 2022 | Generation units shut down in 2022 |
|---------|---------------------------------------|------------------------------------|
| Pi [MW] | 347.18                                | 264.17                             |
| Ci [MW] | 16.67                                 | 265.60                             |

***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 2022, both the new units and the positive power differences between the installed power according to the NRA licenses from 1<sup>st</sup> of January 2023 compared to those from 1<sup>st</sup> of January 2022 were taken into account;
- for the production units released in 2022, 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 1<sup>st</sup> of January 2023 compared to those from 1<sup>st</sup> of January 2022 were taken into account.

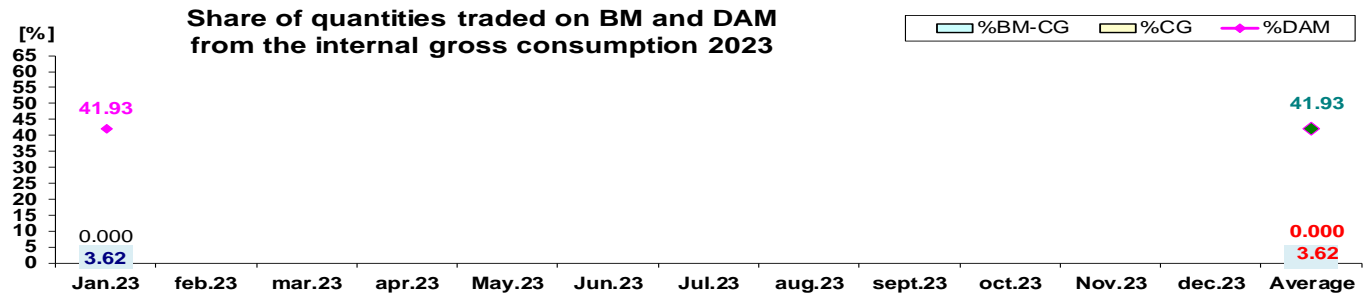
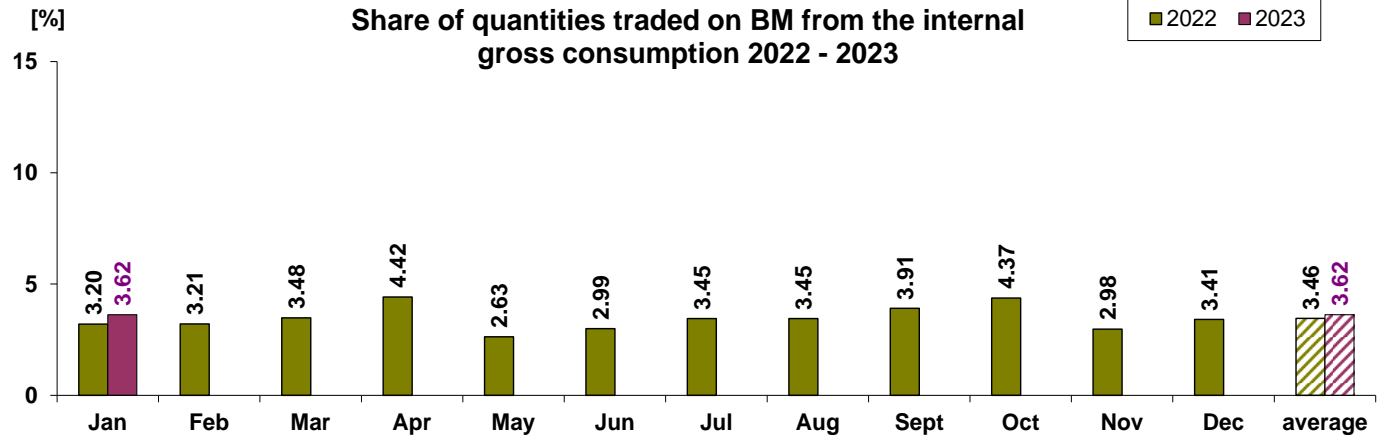


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# Balancing Market

## 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).



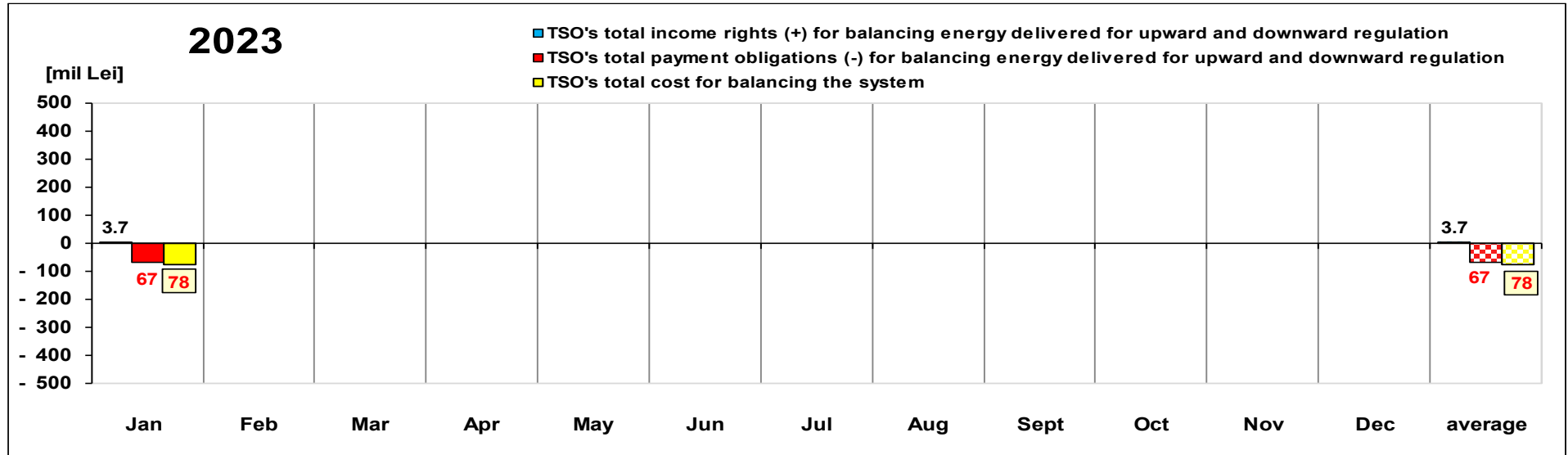
| 2023         |        |        |        |        |        |        |        |        |         |        |        |        |         |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|---------|
|              | Jan.23 | feb.23 | mar.23 | apr.23 | May.23 | Jun.23 | Jul.23 | aug.23 | sept.23 | oct.23 | Nov.23 | dec.23 | Average |
| %BM          | 3.62   |        |        |        |        |        |        |        |         |        |        |        | 3.62    |
| %DAM         | 41.93  |        |        |        |        |        |        |        |         |        |        |        | 41.93   |
| %CG          | 0.000  |        |        |        |        |        |        |        |         |        |        |        | 0.000   |
| %BM-CG       | 3.620  |        |        |        |        |        |        |        |         |        |        |        | 3.620   |
| % 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  | 3 671 254   |     |     |     |     |     |     |     |      |     |     |     | 3 671 254   | 3 671 254    |
|  | payments (-) prices < 0 | -18 058 105 |     |     |     |     |     |     |     |      |     |     |     | -18 058 105 | - 18 058 105 |
| TSO's payment obligations / income rights for balancing energy delivered for upward regulation   | payments (-) prices ≥ 0 | -48 959 475 |     |     |     |     |     |     |     |      |     |     |     | -48 959 475 | - 48 959 475 |
|  | incomes (+) prices < 0  | 0           |     |     |     |     |     |     |     |      |     |     |     | 0           | 0            |
| TSO's total income rights (+) for balancing  |                         | 3 671 254   |     |     |     |     |     |     |     |      |     |     |     | 3 671 254   | 3 671 254    |
| TSO's total payment obligations (-) for  |                         | -67 017 580 |     |     |     |     |     |     |     |      |     |     |     | -67 017 580 | - 67 017 580 |
| TSO's total cost for balancing the system  |                         | -78 018 832 |     |     |     |     |     |     |     |      |     |     |     | -78 018 832 | - 78 018 832 |
| Value of transactions outside BM (with   |                         | 0           |     |     |     |     |     |     |     |      |     |     |     | 0           | 0            |
| Congestion Cost on BM  |                         | 0           |     |     |     |     |     |     |     |      |     |     |     | 0           | 0            |
| Congestion Cost outside BM   |                         | 0           |     |     |     |     |     |     |     |      |     |     |     | 0           | 0            |

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

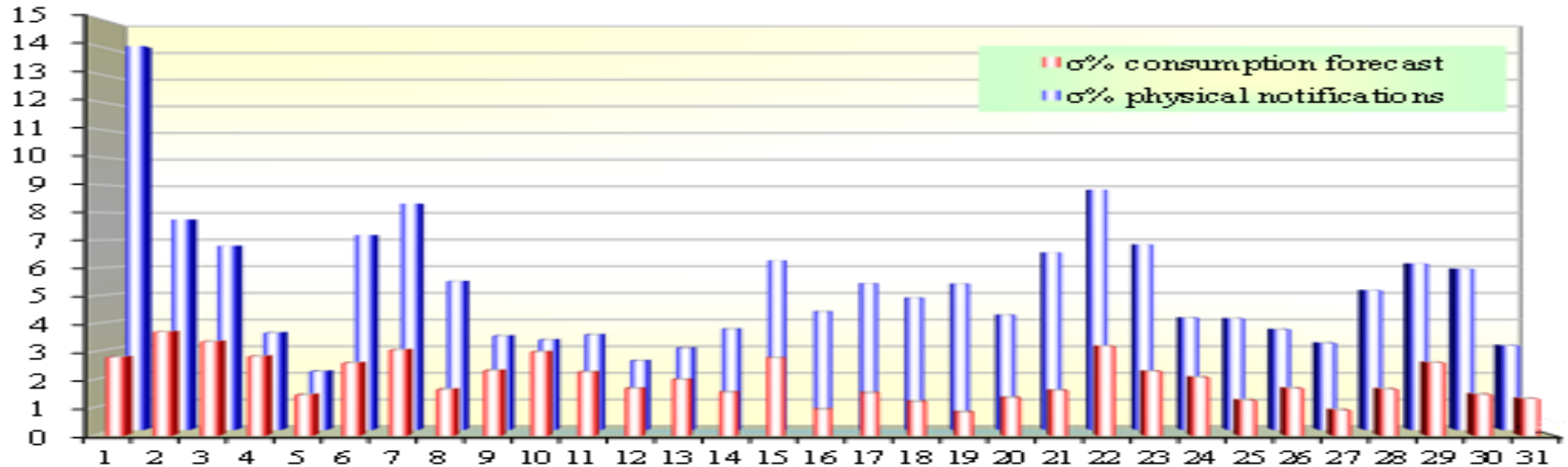




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# Balancing Market

Standard deviation of physical notifications and consumption forecast against the actual consumption in January 2023



Jan2023

| 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   | 2.81  | 3.72 | 3.37 | 2.84 | 1.46 | 2.60 | 3.07 | 1.65 | 2.33 | 3.00 | 2.27 | 1.68 | 2.00 | 1.55 | 2.78 | 0.93 | 1.53 | 1.21 | 0.83 | 1.35 | 1.61 | 3.19 | 2.29 | 2.08 | 1.26 | 1.69 | 0.91 | 1.66 | 2.61 | 1.47 | 1.31 |
| σ% physical notifications | 14.13 | 7.75 | 6.78 | 3.57 | 2.15 | 7.18 | 8.34 | 5.48 | 3.45 | 3.31 | 3.50 | 2.54 | 3.00 | 3.71 | 6.23 | 4.35 | 5.39 | 4.85 | 5.37 | 4.22 | 6.53 | 8.85 | 6.83 | 4.12 | 4.09 | 3.69 | 3.19 | 5.14 | 6.12 | 5.93 | 3.10 |

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

**R = Realized Consumption;**

**N = Physical Notifications;**

**P = Consumption Forecast.**

**σ<sub>average % consumption forecast</sub> = 2.03**

**σ<sub>average % physical notifications</sub> = 5.25**

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

**Public**

# Balancing Market

## Balancing energy – Selected prices and quantities

January 2023

**Downward Regulation**

| Downward Regulation | Prices    |           |           | Quantities |           |           | Participants |            |        |                      |            |      |            |
|---------------------|-----------|-----------|-----------|------------|-----------|-----------|--------------|------------|--------|----------------------|------------|------|------------|
|                     | Weighted  |           |           |            | Actually  |           |              |            |        |                      |            |      |            |
|                     | Average   | Maximum   | Minimum   | Selected   | Delivered | Deviation |              | C1         | C3     | C1                   | C3         | HHI  | HHI        |
|                     |           |           |           |            |           |           |              |            |        |                      |            |      | (actually  |
|                     | [lei/MWh] | [lei/MWh] | [lei/MWh] | [MWh]      | [MWh]     | [%]       | Number       | (selected) |        | (actually delivered) | (selected) |      | delivered) |
| Secondary           | -20.05    | 0.10      | -250.00   | 33013.98   | 33013.98  | 0.00%     | 3            | 63.15%     | 100%   | 63.15%               | 100%       | 4844 | 4844       |
| Fast Tertiary       | -124.79   | 266.00    | -9000.00  | 111411.04  | 108080.20 | 2.99%     | 15           | 38%        | 88.30% | 38.64%               | 88.52%     | 2854 | 2875       |
| Slow Tertiary       | -         | -         | -         | 0.00       | -         | -         | 0            | -          | -      | -                    | -          | -    | -          |
|                     |           |           |           | 144425.01  | 141094.17 | 2.31%     |              |            |        |                      |            |      |            |

**Upward Regulation**

|               | Prices              |           |           | Quantities |                       |           | Participants |            |                      |            |                      |      |      |
|---------------|---------------------|-----------|-----------|------------|-----------------------|-----------|--------------|------------|----------------------|------------|----------------------|------|------|
|               | Weighted<br>Average | Maximum   | Minimum   | Selected   | Actually<br>Delivered | Deviation |              | C1         | C3                   | C1         | C3                   | HHI  | HHI  |
|               | [lei/MWh]           | [lei/MWh] | [lei/MWh] | [MWh]      | [MWh]                 | [%]       | Number       | (selected) | (actually delivered) | (selected) | (actually delivered) |      |      |
| Secondary     | 1813.93             | 2800.00   | 1000.04   | 13412.46   | 13412.46              | 0.00%     | 3            | 65.10%     | 100%                 | 65.10%     | 100%                 | 5023 | 5023 |
| Fast Tertiary | 1090.26             | 2240.49   | 99.00     | 23062.13   | 22583.24              | 2.08%     | 5            | 86.74%     | 95.56%               | 86.82%     | 95.57%               | 7578 | 7592 |
| Slow Tertiary | -                   | -         | -         | 0.00       | -                     | -         | 0            | -          | -                    | -          | -                    | -    | -    |
|               |                     |           |           | 36474.58   | 35995.70              | 1.31%     |              |            |                      |            |                      |      |      |



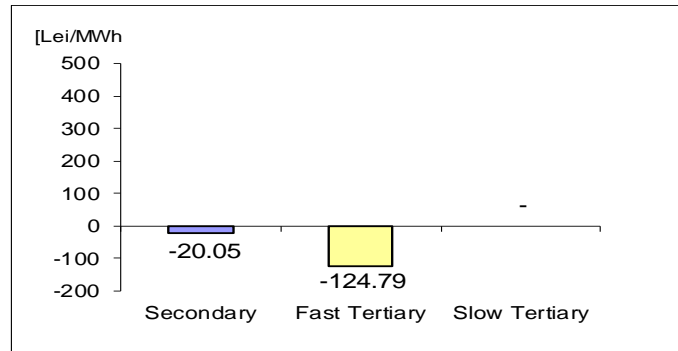
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# Balancing Market

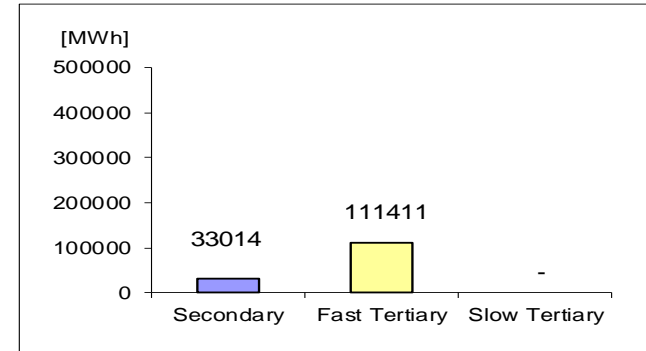
## Balancing energy – Selected prices and quantities in January 2023

January 2023

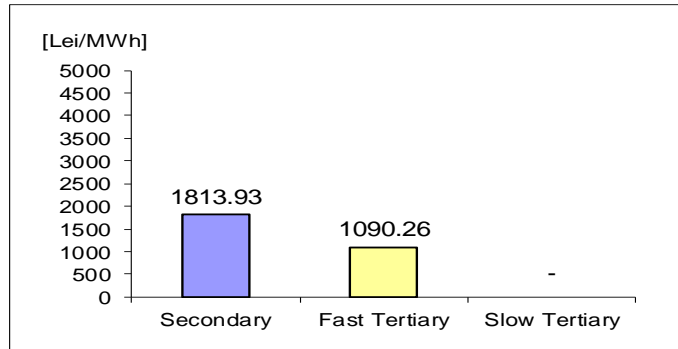
Downward regulation - average price [lei/MWh]



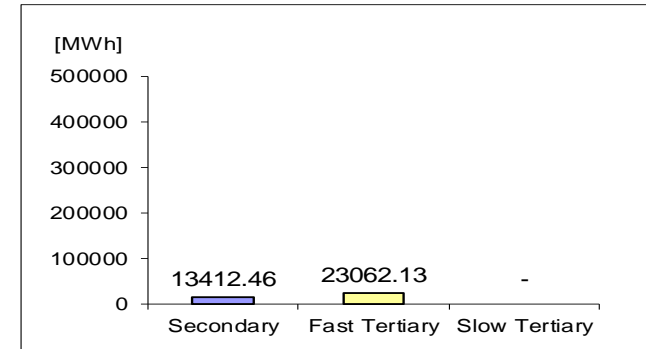
Downward regulation - selected quantities



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  $i$ .

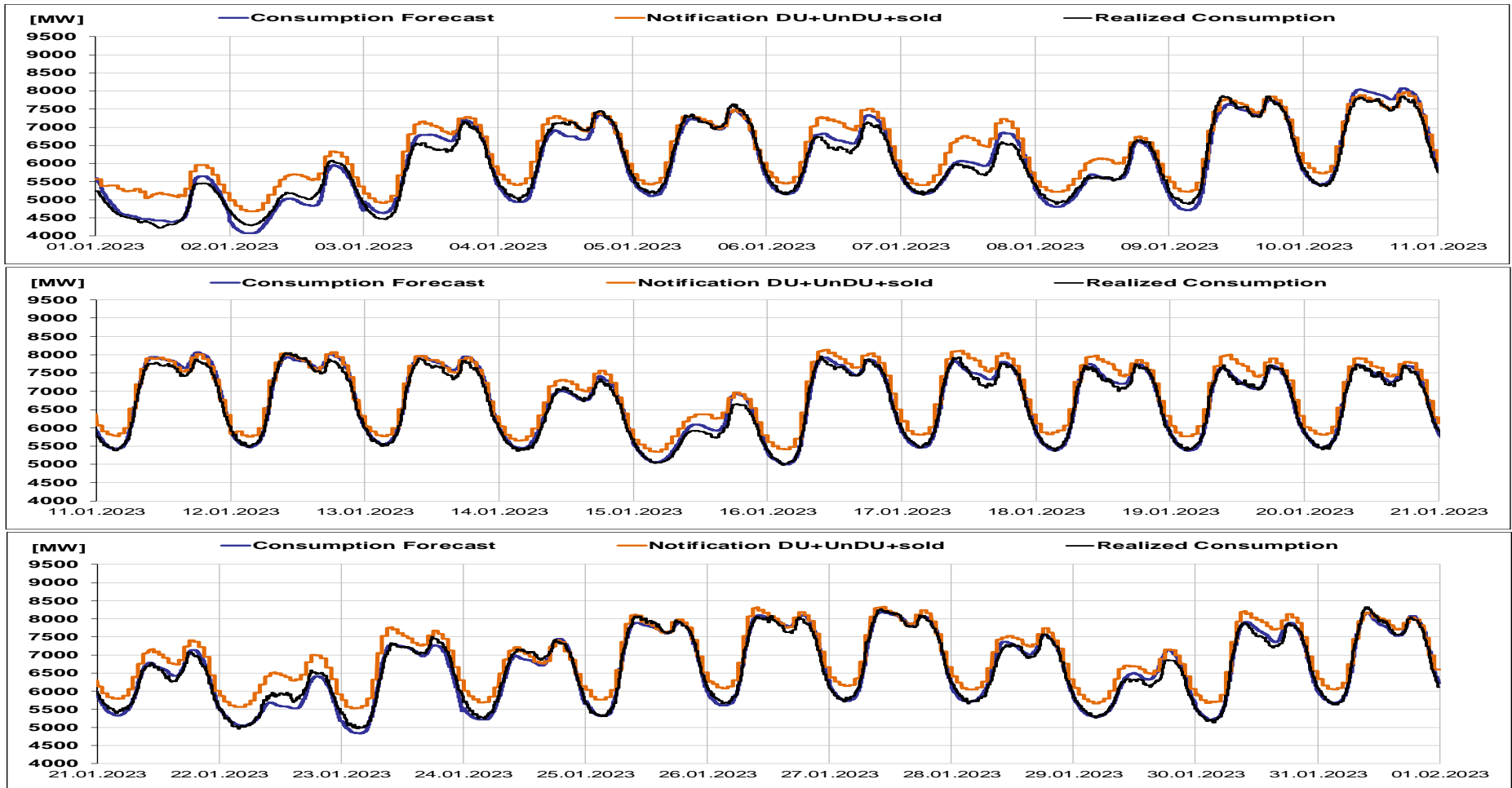


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# Balancing Market

## Realized consumption, forecast, notifications in D-1



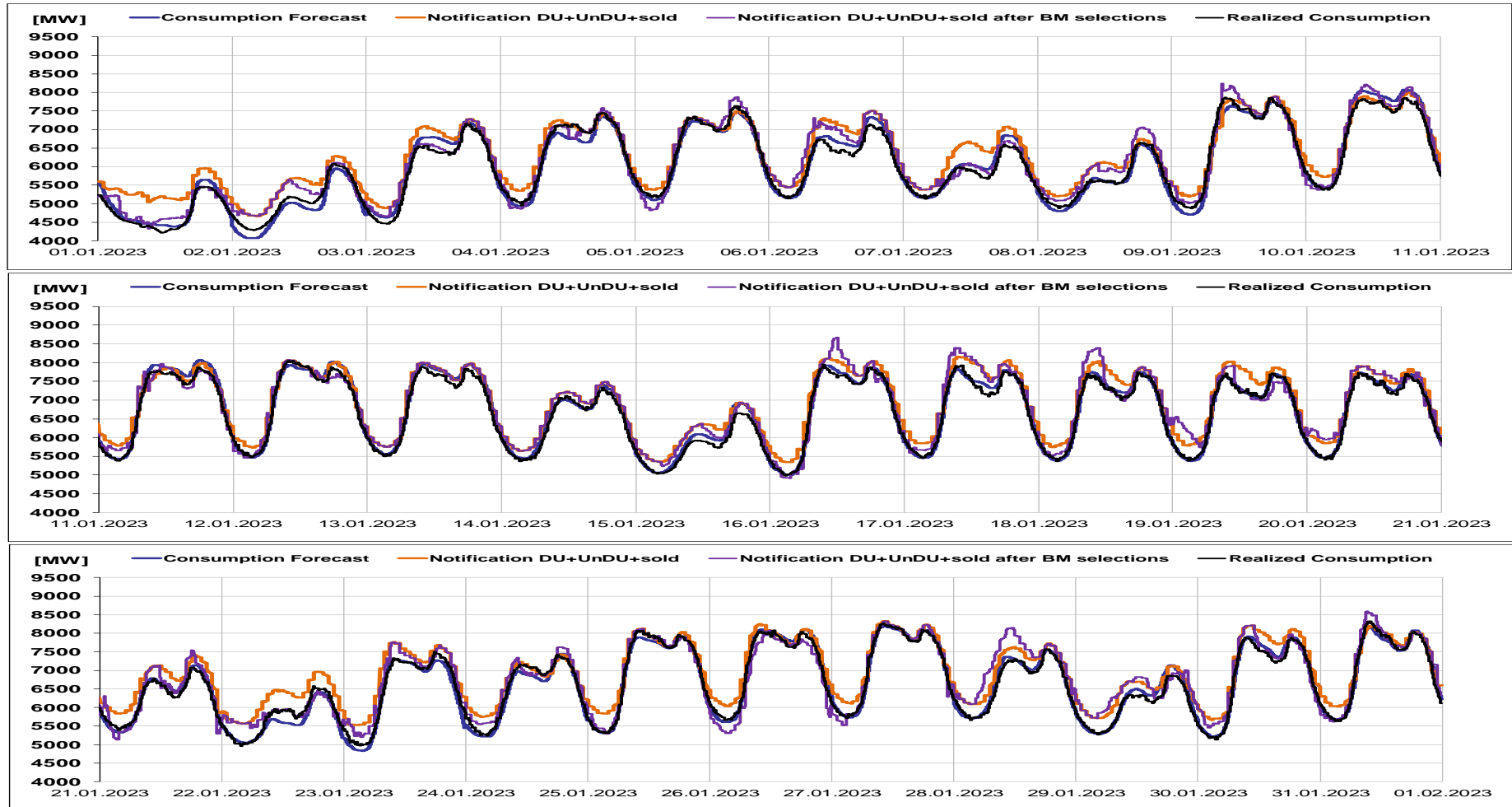


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# Balancing Market

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



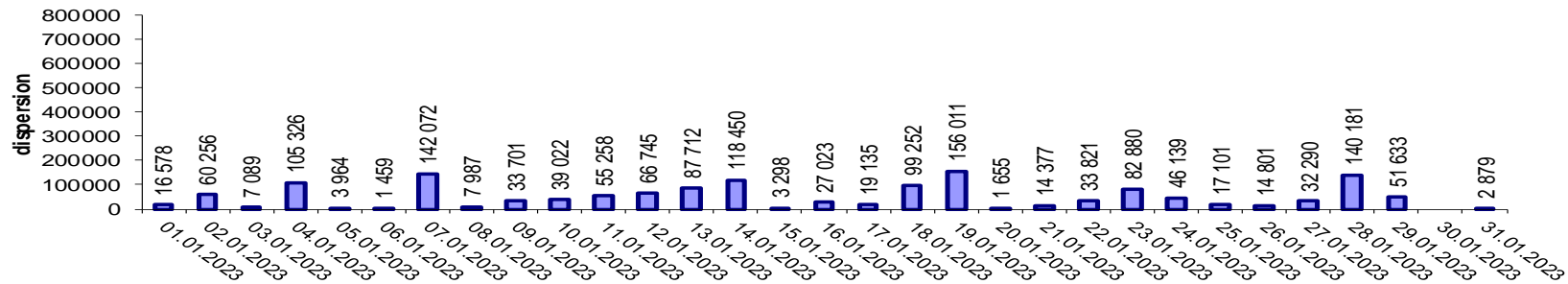


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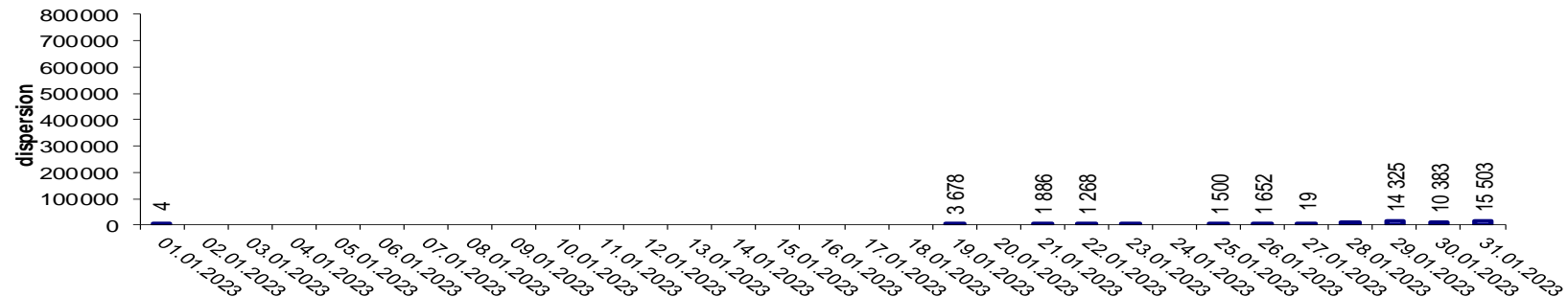
# Balancing Market

## 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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