**List of reference indices calculated and published by**

**Bursa Romana de Marfuri SA *(Romanian Commodities Exchange)***

1. **Preamble**

The RCE calculates and publishes a series of reference indices for the price of natural gas traded on its own platforms as a result of the concluded transactions. Indices are called **“ROGAS”** plus an ending, depending on the type of market segment for which they are calculated.

All indices calculated by the RCE are the intellectual property of the company since the trademarks of the **ROGAS** family are registered with the OSIM (State Office for Inventions and Trademarks).

The transactions concluded on the RCE platforms dedicated to the natural gas market are the source of the data.

1. **Name of indices and meaning:**

**ROGAS\_DA**: is the price index calculated for the transactions concluded for one gas day of natural gas delivery, namely the day ahead.

**ROGAS\_WD**: is the price index calculated for the transactions concluded for one gas day of natural gas delivery, namely the within-day.

**ROGAS\_FW**: is the price index calculated for the transactions concluded on the forward markets for products whose delivery period is exactly the delivery period tracked. The index is calculated BEFORE the beginning of the delivery period tracked with the index.

**ROGAS\_ALL:** is the price index calculated for all transactions concluded within a certain delivery period. The transactions taken into account come from both spot markets and futures markets. The index is calculated AFTER the end of the delivery period tracked with the index.

1. **General principles for determining the index:**

**Indices are calculated as weighted averages of transactions related to a delivery period that is the object of the respective transaction/transactions.**

The general calculation formula is:

**ROGAS “\_ …”** = Sum (Vi\*Pi)/Sum Vi

Where:

ROGAS represents the family of indices calculated by the RCE

“\_..”is the ending of the index with indications regarding the type of the delivery period.

Vi = Transaction volume “i” expressed in MWh

Pi = Transaction price "i" expressed in RON, EUR or US Dollar. The conversion into currencies *(EUR or USD) is* made at the official exchange rates of the NBR published for the day of the transaction.

1. **Indices calculation frequency and their publication**

The indices are calculated at the level of each trading day and are published by the RCE on its own website.

The indices are calculated daily based on the prices of the current trading day.

In case there are no transactions during the current trading day, then the indices value from the respective day is equal with the value of the indices of the last trading day in which transactions have been made.

The values of the indices can be taken over strictly with the express consent of the company, except for the cases provided by the national legislation.

1. **Specific calculation methodology for the** **ROGAS\_DA index**

The calculation model is described for a certain trading day called the T-day.

The physical delivery of natural gas, which is the object of a transaction concluded on gas day T on the RCE platform, must be made on day T+1, the gas day immediately after, according to the applicable legislation in force.

The T and T + 1 gas days are consecutive calendar days, the trading being performed in daily trading sessions on the RCE on term products market.

**ROGAS\_DA *ZZ/LL/AAAA*=** $\frac{\sum\_{i=0}^{n}Pi\*Ci}{\sum\_{i=0}^{n}Ci}$**,**

**Where:**

**“ROGAS\_DA”** is the market segment identifier for the day ahead gas delivery

***“ZZ/LL/AAAA”*** is the gas delivery day (T+1)

**“Pi”** is the price of a single transaction

**“Ci”** is the quantity expressed in number of MWh, related to the single transaction

**“n”** is the total number of transactions concluded on the market segment for the day ahead gas delivery

**“i”** identifies the transaction recorded in the RCE trading system for the market segment for the day ahead

“**DA**” – acronym for the day ahead

1. **Specific calculation methodology for the** **ROGAS\_WD index**

The calculation model is described for a certain trading day called the gas day T.

The physical delivery of natural gas, which is the object of a transaction concluded on gas day T on the RCE platform must also be made on day T, the same gas day according to the applicable legislation in force.

Day T is identified in the index by the time stamp on the day, month and year coordinates.

**ROGAS\_WD *ZZ/LL/AAAA*=** $\frac{\sum\_{i=0}^{n}Pi\*Ci}{\sum\_{i=0}^{n}Ci}$**,**

**Where:**

**“ROGAS\_WD”** is the market segment identifier for the current delivery gas day

***“ZZ/LL/AAAA”*** is the delivery gas day (T)

**“Pi”** is the price of a transaction

**“Ci”** is the quantity expressed in the number of MWh, related to the transaction

**“n”** is the total number of transactions concluded on the market segment for the current delivery gas day

**“i”** identifies the transaction recorded in the RCE trading system for the current day market segment

“**WD**” – acronym for the within day

1. **Specific calculation methodology for the** **ROGAS\_FW** **index**

The delivery periods for which indices are calculated are as follows: month, quarter, semester and calendar year, gas season and gas year.

The calculation frequency is daily and the calculation model is described for a certain trading day called day T in which transactions are concluded on all RCE platforms with medium and long-term products with standard delivery periods, fixed transaction price and delivery in flat profile.

The published indices related to the periods have the following terminology:

**ROGAS\_FW *Luna\_AAAA – Month\_YYYY*, index for a specific calendar month of delivery. Example: *Decembrie\_2020, Ianuarie\_2021, Februarie \_2021 etc. – December\_2020, January\_2021, February\_2021,* *etc.***

**ROGAS\_FW *Trimestrul X\_AAAA – Quarter X\_YYYY,* index for a certain calendar quarter of delivery. Example: *Trimestrul 4\_ 2020, Trimestrul 1\_2021, Trimestul 2\_2021, etc. – Quarter 4\_ 2020, Quarter 1\_2021, Quarter 2\_2021, etc.***

**ROGAS\_FW *Semestrul X\_AAAA – Semester X\_YYYY,* index for a certain calendar semester of delivery. Example: *Semestrul 2\_ 2020, Semestrul 1\_2021, Semestrul 2\_2021, etc. – Semester 2\_ 2020, Semester 1\_2021, Semester 2\_2021, etc.***

**ROGAS\_FW *An calendaristic\_AAAA – Calendar year\_YYYY*,** **index for a certain calendar year of delivery. Example: *An calendaristic\_2020, An calendaristic\_2021, etc. – Calendar year\_2020, Calendar year\_2021, etc.***

**ROGAS\_FW *Sezon gazier cald/rece\_AAAA – Hot/warm gas season\_YYYY*, index for a certain gas season of delivery. Example: *Sezon gazier rece\_2020, Sezon gazier cald\_2021, Sezon gazier rece\_2021, etc. – Cold gas season\_2020, Hot gas season\_2021, Cold gas season\_2021, etc.***

**ROGAS\_FW *An gazier\_AAAA – Gas year\_YYYY,* index for a certain gas year of delivery. Example: *Sezon gazier rece\_2020, Sezon gazier cald\_2021, Sezon gazier rece\_2021, etc. – Cold gas season\_2020, Hot gas season\_2021, Cold gas season\_2021, etc.***

**Where:**

**“ROGAS\_FW”** is the identifier of the market segment of the medium and long-term products

“***YYYY***” is the calendar year in which the delivery related to the product delivery period begins

**Calculation method:**

1. Step 1 – Identification of all Forward and Futures transactions that have a flat delivery profile and fixed price of the transaction and a certain delivery period: *month, quarter, semester, gas season, gas year or calendar year.*
2. Step 2 – Calculation on a daily basis of the weighted average price for the transactions concluded on the respective day on the products with the delivery period tracked by the index.
3. Step 3 – Update of the value of the price index at the time of a change.

*Example for products with the delivery period the calendar year 2021*

*ROGAS\_FW* ***Calendar year\_2021****=* $\frac{\sum\_{i=0}^{n}Pi\*Ci}{\sum\_{i=0}^{n}Ci}$*,*

*Where:*

*“****Calendar year****\_2021” is the delivery period related to the gas year 2021, respectively* *01.01.2021-31.12.2021 gas days*

*“Pi” is the price of a single transaction*

*“Ci” is the quantity expressed in number of MWh, related to the single transaction*

*“n” is the total number of transactions concluded on the market segment for the gas year 2021*

*“i” identifies the transaction registered in the RCE trading system for the gas year 2021*

*“FW” –* *acronym for forward markets.*

1. **Specific calculation methodology for the** **ROGAS\_ALL index**

**ROGAS\_ALL type indices are price indices that cumulate all transactions concluded on the RCE platforms with products** that have a flat delivery profile, fixed transaction price and standard delivery period**.**

**The types of indices calculated are related to a certain delivery period:**

* **Delivery day**
* **Delivery months**

**Daily index** **ROGAS\_ALL *ZZ/LL/AAAA***

***Examples:* ROGAS\_ALL *31/12/2020,* ROGAS\_ALL *01/01/2021,* ROGAS\_ALL *02/01/2021***

**The index calculates the weighted average price for all transactions that included a certain delivery day as the delivery period. *The index is calculated for each gas day on the day ahead, after the completion of transactions on the within day market.***

**The calculation model is described for a certain delivery day called day T**.

**Calculation method:**

1. **Step 1 – Identifying of all Forward/Futures transactions that include the day T in the delivery period.**
2. **Step 2 – Assigning the number of MWh related to day T to the price in the transaction identified in step 1 and obtaining the value of the related transaction for day T.**
3. **Step 3 – Summarizing all transaction values from step 2 for day T.**
4. **Step 4 – Summarizing the values of all transactions (price\*quantity) on the market for the day ahead (DA) for day T.**
5. **Step 5 – Summarizing the values of all transactions (price\*quantity) on the market for the within day (WD) for day T.**
6. **Step 6 – SUMMARIZING OF VALUES ON ALL MARKETS (STEPS 3,4 AND 5)**
7. **Step 7 – Summarizing the total number of MWh related to the transactions (from steps 3, 4 and 5)**
8. **Step 8 – Calculating the global weighted average - dividing the total value (step 6) by the number of MWh (step 7)**

**That is, obtaining the global weighted average for one day of delivery**

**ROGAS\_ALL *ZZ\_LL\_AAAA*=** $\frac{\sum\_{i=0}^{n}PiDA\*CiDA + \sum\_{i=0}^{n}PiWD\*CiWD + \sum\_{i=0}^{n}PiFW\*CiFW }{\sum\_{i=0}^{n}CiDA+\sum\_{i=0}^{n}CiWD+\sum\_{i=0}^{n}CiFW}$**,**

**Where:**

**“ROGAS\_ALL”** is the identifier of the composite index for a certain delivery period

***“ZZ\_LL\_AAAA”*** is the delivery day tracked

**“PiDA”** is the price for a single transaction on day T on the day ahead market

**“PiWD”** is the price of a transaction on day T on the within day market

**“PiFW”** is the price related to a single transaction for day T on the forward market that includes day T in the delivery period of the basic transaction

**“CiDA”** is the quantity expressed in number of MWh related to the single transaction for day T on the day ahead market

**“CiWD”** is the quantity expressed in number of MWh related to the single transaction for day T on the within day market

**“CiFW”** is the quantity expressed in number of MWh related to the single transaction for day T on the forward marker, obtained by assigning the number of MWh in flat delivery profile/day from the total number of MWh related to the basic transaction

**“n”** is the total number of transactions concluded on a certain market segment

**“i”** identifies the transaction recorded in the RCE trading system

**Monthly index** **- ROGAS\_ALL *Luna\_AAAA – Month\_YYYY***

***Examples:* ROGAS\_ALL *Decembrie\_2020,* ROGAS\_ALL *Ianuarie\_2021,* ROGAS\_ALL *Februarie\_2021 -* ROGAS\_ALL *December\_2020,* ROGAS\_ALL *January\_2021,* ROGAS\_ALL *February\_2021***

**The index calculates the weighted average price for all transactions whose delivery was in a MONTH. The index is calculated for the MONTH tracked on the day immediately after the last delivery day of the month, after the completion of transactions on the within day market for the last delivery day.**

The calculation model is described for a MONTH **of delivery and is similar to the calculation model for DAY T with the following complementary specifications:**

1. Step 1 – Summarize the **total values** resulting from trading **for each delivery day within a month of delivery.**
2. Step 2 – Summarize **the total quantities** resulting from trading **for each delivery day within a month of delivery tracked**.
3. Step 3- Calculate the weighted average corresponding to the delivery month tracked by dividing the total value (step 1) to the total quantity of MWh (step 2) for a certain delivery month.

**FINAL NOTE: The list of published indices and the calculation methodology is established by the RCE and published periodically on the website** **www.brm.ro.**