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NOT FOR PUBLICATION

MODERNISATION FUND
 Accelerating the transition to climate neutrality



MODERNISATION FUND EIB DUE DILIGENCE REPORT OF NON-PRIORITY INVESTMENT PROPOSAL

As per Article 7 of Commission Implementing Regulation (EU) 2020/1001¹

Reference: MF 2023-1 RO 1-002

Due Diligence Date: 14/03/2023

[...]

| Investment Proposal Details | |
|---|--|
| Title of the investment | Gas transmission pipeline Ghercești-Jitaru (including power supply, cathodic protection and fibre optic) |
| Type of Investment | <input checked="" type="checkbox"/> project <input type="checkbox"/> scheme |
| Beneficiary Member State (BMS) | Romania |
| Project proponent / Managing authority | Ministry of Energy |
| Date of Receipt of Proposal | 15/01/2023 |
| Total investment cost / Total volume of the scheme (in EUR) | [...] |
| Total support from the Modernisation Fund (EUR) | 38 277 852 |
| Requested amount of the first disbursement from the Modernisation Fund in case of the project (EUR) | 38 277 852 |
| Co-financing rate of the Modernisation Fund (% of the total cost) | [...] |

¹ Implementing Regulation (EU) 2020/1001 – 9th July 2020

Pursuant to Article 4(1) of the Commission Implementing Regulation (EU) 2020/1001, the BMS submitted a non-priority investment proposal relating to the “Gas transmission pipeline Ghercești-Jitaru (including power supply, cathodic protection and fibre optic)”.

[...]

Pursuant to its obligations under Article 7 of the Commission Implementing Regulation, EIB has undertaken a due diligence of the above referenced Investment Proposal. As stipulated in the IR, the due diligence is limited to the technical, financial and GHG aspects of the submitted proposal and is based on the information set out in Annex I of the IR and subsequent clarifications. The results of this due diligence are set out as follows:

1. Description of the investment

Objectives

The Investment Proposal Submission Form (IPSF) lists the following investment objectives:

- Meeting the objective of reducing domestic greenhouse gas emissions by creating the necessary infrastructure to supply gas to natural gas power plants that will replace coal-fired power plants (Isalnita, Turceni) according to the NECP for the period 2021-2030.
- Contributes to the energy efficiency improvement goal with a primary energy saving of 37 647.00 Toe/ year (437 834.00 MWh/year).
- Upgrade the National Gas Transmission System (NTS) by creating the conditions to be able to transport the natural gas - hydrogen mix to reduce greenhouse gas emissions.
- Diversification of natural gas supply sources for consumers in the region and increase natural gas storage capacity to cover consumption peaks caused mainly by temperature variations and to maintain the optimal operating characteristics of the national gas transmission system.

In addition to supplying natural gas to the Isalnita and Turceni power plants, the project also aims to supply the Ghercesti storage facility system to ensure operating conditions at a capacity of 600 million cubic metres per cycle. According to the IPSF, the upgraded Ghercești storage facility cannot be operated at the new capacity and parameters without the implementation of the proposed project.

Scope

The project foresees building a natural gas transmission pipeline DN 600 at PN 50 bar, with a length of approx. 90 km, able to carry a flow rate of approx. 219 600 cm/h (1.923 bcm/year) between Ghercesti (Dolj county) - Slatina - Jitaru (Olt county).

EIB Comment:

Recognising the importance and the strategic relevance of strengthening and expanding the existing gas infrastructure for alleviating security of supply concerns generated by the current context and enabling Romania to use its natural reserves while contributing to the climate neutrality transition. Nonetheless, the following assessment considers the legal basis under

which the Modernisation Fund operates, which states that the purpose of this instrument is to ultimately reduce GHG emissions and help meet 2030 climate objectives.

EIB notes that this investment proposal relates to gas piping infrastructure that will form part of the broader Romanian natural gas network. EIB, as per the Implementing Regulation, is required to undertake an assessment of expected emission (GHG) reductions. The fundamental issue with such an investment proposal is how to attribute gas transmission capacity that could enable GHG emission reductions, and thus how to attribute a GHG emission reduction value to gas flowing in a pipe, if the final destination of the gas is unknown and there is uncertainty (no guarantee) as to whether it will actually displace more carbon intensive fuel use or indeed whether it could lead to greater consumption of gas and thus higher GHG emissions.

Considering the purpose of the Modernisation Fund is ultimately to reduce GHGs and meet 2030 climate objectives, it can only support the part of the project that directly contributes to the greenhouse gas emission reductions as set out in 10d(1).

The above two paragraphs set the boundaries within which the GHG reductions and the funding thresholds are assessed.

The investment proposal is prepared on the assumption that Transgaz needs to ensure natural gas supply to new CCGTs (Turceni, Isalnita, Mintia, Halanga, Govora, Chiscani) and to deliver the necessary volumes to enable the upgrade of gas storage capacity in Ghercesti.

Investment proposal assumes that all new CCGTs will operate at full capacity and electricity generated will replace electricity generated in coal-based assets that are also assumed to be operating at close to 100% of its capacity (although some have not been operational for several years).

According to national data provided in the proposal, the electricity generated from coal in 2021 constituted 10.21 TWh (9.32 TWh in 2020). Average annual electricity generated from coal in the period of 2017-2021 was 12.7 TWh.

The EIB assumes that from 22.6 TWh/y of electricity generated in new gas fired plants, 12.7 TWh/y will replace electricity generated in coal fired plants.

The maximum technical capacity of the Ghercesti - Jitaru pipeline is of 1.923 bcm/year. The proposal states that the current investment is required to ensure operation of Turceni and Isalnita CCGTs for what the required capacity of the line is 0.405 bcm/year.

Since both Isalnita and Turceni CCGTs are replacing coal power plants, resulting in GHG emissions reduction, the relevant capacity, to align with the objectives of the Modernisation Fund, is estimated at around 21% of the total capacity of the pipeline.

The construction of the investment objective is expected to allow for the possibility to take over into the NTS from the storage facility the gas amount of approximately 5 million cm/day for the balancing needs of the NTS or to ensure the transmission of gas to consumers in the event of difficult climatic conditions or disruption of gas supply.

In addition to the gas flow required by the Gas Storage Facility, a flow rate was also taken into account for the supply of natural gas to the following localities along the pipeline route: Municipality of Slatina (OT); Town of Scornicești (OT); Town of Balș (OT), Osica de Sus (OT); Fălcoiu (OT); Mărunței (OT); Coteana (OT); Ipotești (OT); Brebeni (OT); Milcov (OT); Valea Mare (OT); Bobicești (OT); Barza (OT); Pârșcoveni (OT); Șopârlița (OT); Ghercești (DJ),

Pielești (DJ), Robănești (DJ), i.e. about 146 587 inhabitants, 259 public institutions (schools, town halls, dispensaries, cultural centres, medical offices, etc.) and about 150 economic agents.

With regard to the objective to supply natural gas to localities in the project area, some of the above-mentioned localities already have distribution networks supplied with natural gas and for the others, where there are currently no distribution networks, they are to be developed by the title holders of the distribution systems on the basis of applications for connection to the National Gas Transmission System. For the areas without an existing gas distribution network, an analysis of less carbon intensive solutions should be considered.

Since the project promoter is not in control of the process of connecting new users, there may be risk that project objectives in that respect may not be fully achieved.

[...]

2. Justification for the Modernisation Fund support, including the confirmation of the compliance of an investment with Article 10d(1) of the ETS Directive

The IPSF states that the investment represents a modernisation and construction of new sections of energy infrastructure.

EIB Opinion:

Compliance with Article 10d(1) of the ETS Directive requires for the MF supported investment to modernise energy systems and improve energy efficiency. The investments supported shall be consistent with the aims of the ETS Directive, as well as the objectives of the Union's 2030 climate and energy policy framework and the long-term objectives as expressed in the Paris Agreement.

The proposed investment would create possibilities to supply required gas volumes to the CCGT plants referenced in the National Energy and Climate Plan 2021-2030 (NECP), namely: Isalnita and Turceni, which will replace the lignite-based units.

Taking into consideration project objectives listed in the IPSF and the scope of the investment, the EIB believes that part of the created gas transmission capacities may contribute to transition from more carbon intensive fossil fuels and hence to GHG emission reductions.

EIB observes that the project may result in the extraction and use of additional natural gas volumes in Romania and Europe that could under certain conditions contribute to an increase of total GHG emissions while also contributing to energy security and diversification of energy supply. The risk of increase of emissions can be somewhat mitigated by using the pipes for an increased share of green hydrogen.

[...]

3.2 GHG assessment

The IPSF provides a specific value for the reduction of GHG emissions to be achieved by the investment of 148 042.22 tons CO₂/year. Considering that this pipeline is designed to transport natural gas in combination with up to 10% hydrogen, the IPSF provides a specific value for the reduction of GHG emissions to be achieved by the investment of 152 483 to CO₂/year.

The above values in the project documentation are based on the following assumptions:

- a) The extension of gas transmission network is necessary to ensure supply of the natural gas to the following CCGTs in Romania:

| New power plant | Capacity installed (MW) | Operating hours (h/y) | Load factor | Electricity production (MWh/y) |
|-----------------|-------------------------|-----------------------|-------------|--------------------------------|
| CCGT Isalnita | 850 | 8 100 | 80% | 5 508 000 |
| CCGT Turceni | 475 | 8 100 | 80% | 3 078 000 |
| CCGT Mintia | 1 700 | 8 100 | 80% | 11 016 000 |
| CCGT Halanga | 181 | 8 100 | 80% | 1 172 880 |
| | | | | 20 774 880 |

- b) The calculation does not assume GHG emission reductions resulting from natural gas supply to localities where gas distribution network currently is not available.
- c) The production of electricity from natural gas will replace generation of electricity from lignite from the below coal power plants.

| Existing power plants | Capacity installed (MW) | Operating hours (h/y) | Load factor | Electricity production (MWh/y) |
|-----------------------|-------------------------|-----------------------|--------------|--------------------------------|
| Isalnita | 850 | 8 100 | 80% | 5 508 000 |
| Turceni | 475 | 8 100 | 80% | 3 078 000 |
| Mintia | 1 285 | 8 100 | 80% | 8 326 800 |
| Halanga | 181 | 8 100 | 80% | 1 172 880 |
| | | | Total | 18 085 680 |

- d) The emissions of CO₂ per MWh of electricity are as follows:

| | | |
|--|---------|---------|
| Natural gas specific emissions (tCO ₂ /MWh) | 0.38419 | ton/MWh |
| Lignite-specific emissions (tCO ₂ /MWh) | 0.82318 | ton/MWh |

- e) The GHG emission reductions resulting from replacement coal with natural gas are:

| Coal | | | | Natural gas | | | |
|----------|-----------|-----------------------|---------------------|-------------|-----------|-----------------------|---------------------|
| Coal PP | MWh/y | tCO ₂ /MWh | tCO ₂ /y | CCGT | MWh/y | tCO ₂ /MWh | tCO ₂ /y |
| Isalnita | 5 508 000 | 0.82318 | 4 534 075 | Isalnita | 5 508 000 | 0.38419 | 2 116 119 |
| Turceni | 3 078 000 | 0.82318 | 2 533 748 | Turceni | 3 078 000 | 0.38419 | 1 182 537 |

| | | | | | | | |
|---------|-----------|---------|-------------------|---------|------------|---------|------------------|
| Mintia | 8 326 800 | 0.82318 | 6 854 455 | Mintia | 11 016 000 | 0.38419 | 4 232 237 |
| Halanga | 1 172 880 | 0.82318 | 965 491 | Halanga | 1 172 880 | 0.38419 | 450 609 |
| | | | 14 887 770 | | | | 7 981 501 |

- f) Additionally, to CO₂ emissions from CCGTs there are emissions related to methane leakage from the transmission network. They were calculated under assumption that methane leakage emissions from pipes are at the level of 2.235 tons CH₄/km/year (applied CO₂ equivalence factor is 28).

| | |
|---|------------------|
| Methane leakage emissions from Black Sea - Podisor pipeline | 19 274.64 |
| Methane leakage emissions from Ghercesti - Jitaru pipeline | 5 632.20 |
| Methane leakage emissions from Jupa - Prunisor pipeline | 11 107.95 |
| Emissions during the construction period for all pipilines | 7 884.00 |
| Storage compressor station co2 emissions | 39 117 |
| Total | 83 016.01 |

- g) Total GHG emission reduction based on the above assumptions would be 6 823 253 t/CO₂.
- h) The total investments cost claimed as necessary to achieve the above reductions of CO₂ are as follows:

| No. | Plant | Total estimated cost (Euro) | share of total cost |
|-----|--|-----------------------------|---------------------|
| 1. | CCGT Işalniţa | [...] | |
| 2. | CCGT Turceni | [...] | |
| 3. | CCGT Mintia | [...] | |
| 4. | CCGT Halanga | [...] | |
| 5. | Black Sea - Podisor | [...] | 17.04% |
| 6. | Isalnita & Turceni conection pipelines | [...] | 0.86% |
| 7. | Ghercesti - Jitaru | [...] | 2.17% |
| 8. | Jupa - Prunisor | [...] | 3.98% |
| 9. | Mintia conection pipeline | [...] | 1.46% |
| | TOTAL | [...] | 25.51% |

The reduction in GHG emission related to each investment were allocated proportionally to share of the cost.

- i) The CO₂ reduction allocated to this section of the pipe is 148 042.22 t CO₂/year.

- j) Additional 3% of the above amount was assumed as CO₂ savings resulting from the fact that pipe can transmit 10% of hydrogen, which altogether gives 152 483.48 t CO₂/year.

EIB Opinion:

The GHG reduction calculations provided as part of the IPSF include following assumptions which seem over generous:

- It assumes that currently all listed coal fired plants are operated at full capacity and generates 18 TWh of electricity. Average electricity generated in coal fired plants during 2017-2021 was only 12.7 TWh/y (9.32 TWh in 2020 and 10.2 TWh in 2021).
- It assumes that all new CCGTs will operate at full capacity and that electricity generated in those CCGTs will replace electricity generated in coal-based assets. The assumption is not correct because all listed CCGTs if operated at full capacity would generate more electricity than it is currently generated in coal fired plants.
- The GHG calculation does not include GHG emissions that would be resulting from the CCGT in Govora and Chiscani.

The capacity of the pipeline is significantly higher than the that needed to supply the CCGTs that replace coal power plants. The maximum technical capacity of the Ghercesti - Jitaru pipeline is of 1.923 bcm/year and the proposal states that the required capacity for the CCGTs allocated from this pipeline is 0.405 bcm/year for supply to Isalnita and Turceni power plants.

EIB is aware that gas storage throughout Europe has a central role in balancing the deviation between gas delivery rate and gas utilization rate on an annual basis. Based on the information provided, it is not entirely evident to what degree the pipeline connection to Ghercești Gas Storage can achieve GHG reductions. However, some GHG savings could possibly be achieved based on planned regimes of gas system operation and overall gas demand in the network, further it would address other objectives such as security of supply and diversification.

Presently, there is no basis to quantify GHG emission reduction potential enabled by the possibility to blend hydrogen with natural gas and transport it by transmission pipes.

Based on the above actual GHG emission reductions resulting from the proposed pipeline itself would be lower than it is claimed in the project documentation.

[...]

8. Modernisation Fund contribution

The IPSF requests for the Modernisation Fund support at following levels:

| Category | MF funding percentage | Financed cost |
|----------|-----------------------|---------------|
| Design | [...] | [...] |

| | | |
|--|-------|-------|
| Land acquisition | [...] | [...] |
| Construction and assembly | [...] | [...] |
| Plant and machinery or equipment | [...] | [...] |
| Contingency expenses | [...] | [...] |
| Technical assistance | [...] | [...] |
| Project management | [...] | [...] |
| Other costs (commissions, taxes, etc.) | [...] | [...] |
| Total investment cost | [...] | [...] |

The ISPF writes that EUR 54 682 646.14 are considered as eligible costs for the MF support.

The MF support from the eligible costs claimed in the IPSF would be 70% or 60% from overall investment cost.

EIB Comment

For the Modernisation Fund contribution calculation, it is important to determine if all investment costs lead to GHG emission reduction. As already indicated above, given the specific pipeline project will be one element of an extensive gas piping network, it is difficult to attribute GHG emission reductions, with a sufficient degree of certainty, to the gas flowing in the pipeline as there will always be uncertainty as to the final destination of the gas and whether it will be used to replace more carbon intensive fuels or in fact lead to higher consumption of gas.

With this in mind, and as discussed in Section 1 of this due diligence report, the gas volumes contributing to GHG reductions and transmitted via new pipeline:

- The IPSF states that Ghercesti - Jitaru required capacity for CCGT is 0.405 bcm/y.
- The technical capacity of the proposed pipeline is 1.923 bcm/y.
- The pipeline capacity relevant to GHG emission reductions represent 21% of the overall capacity of the new pipeline.

The costs of the project that can be reasonably estimated to replace coal-fired electricity can be taken as € 11 483 355 (21% x € 54 682 646.14). The allowable funding from the MF would then be up to € 8 038 348 (70% x € 11 483 355).

[...]

13. The EIB conclusion

Pursuant to Article 7.2 of the Implementing Regulation, the EIB has carried out a technical and financial due diligence of the proposal, including an assessment of the expected emission reductions. The assessment was carried out based on the information submitted pursuant to Article 4 and Annex 1 of the Implementing Regulation.

Without challenging the project's role in the overall security of supply and diversification of energy sources in Romania's energy context, the due diligence was carried out considering

the legal basis under which the Modernisation Fund operates, assessing the project's contribution to reducing GHG emissions and meeting 2030 climate objectives.

Considering the due diligence findings set out above, and as required by Article 7.6 of the Implementing Regulation, the EIB endorses a partial financing of the Investment Proposal "Gas transmission pipeline Ghercești-Jitaru (including power supply, cathodic protection and fibre optic)" in respect of the gas transmission capacity that corresponds to the amount of gas that can be reasonably estimated to replace coal-fired electricity generation as explained above. Thus, the derived maximum funding threshold, based on the above assessment and best possible assumptions, is EUR 8 038 348. The final decision on financing the investment proposal rests with the Investment Committee.