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NOT FOR PUBLICATION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) 2020/1001<sup>1</sup>

**Reference:** MF 2023-1 RO 1-001

**Due Diligence Date:** 16/03/2023

**Investment Committee Date:** 30/03/2023

Investment Proposal Details	
Title of the investment	Gas Transmission Pipeline Black Sea-Podisor
Type of Investment	<input checked="" type="checkbox"/> project <input type="checkbox"/> scheme
Beneficiary Member State (BMS)	Romania
Managing authority	Ministry of Energy
Date of Receipt of Proposal	14/01/2023
Total investment costs (in EUR)	[...]
Total support from the Modernisation Fund (EUR)	316 274 837
Requested amount of the disbursement (EUR)	316 274 837
Co-financing rate of the Modernisation Fund (% of the total cost)	[...]

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

Pursuant to Article 4(1) of the Commission Implementing Regulation (EU) 2020/1001, on 15/01/2023 the BMS submitted a non-priority investment proposal relating to the “Gas Transmission Pipeline Black Sea-Podisor”.

[...]

Pursuant to its obligations under Article 7 of the Commission Implementing Regulation (IR), the 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:

- Create the necessary infrastructure to enable supply gas to natural gas power plants (Isalnita, Turceni, Mintia).
- Contribute to the energy efficiency improvement goal with a primary energy savings.
- Upgrade the National Transmission System (NTS) by creating the conditions to transport the natural gas - hydrogen mix to reduce greenhouse gas emissions.
- Increase the security of natural gas supply, facilitate cross-border exchanges with the Republic of Moldova, Ukraine, Bulgaria and Hungary.
- Secure natural gas flows to facilitate the processing of rare earth deposits in the South-West and West of Romania under conditions of increased efficiency.

### Scope

The project foresees construction of 308.1 km natural gas transmission pipeline with maximum capacity of 12 bcm/year from the Black Sea gas take-off point to the connection to the BRUA (Bulgaria-Romania-Hungary-Austria) pipeline in Podisor.

#### 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 enable natural gas supply to new CCGTs and to serve gas storage in Ghercesti.

The investment proposal assumes that all new CCGTs (Turceni, Isalnita, Mintia, Halanga, Govora) will operate at full capacity. The electricity generated from natural gas is expected to replace electricity generated in coal fired assets that are also assumed to be operating at close to 100% of its capacity. The EIB understands that in practice a number of coal fired plants have not been in operation for some years or are operating at much lower capacities.

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 at national level in the period of 2017-2021 was 12.7 TWh.

Capacities of all CCGTs resulting in the need to develop the national gas transmission network are as follows:

Source description	Capacity	Unit
Isalnita	850	MW
Turceni	475	MW
Mintia	1 700 (400 in NECP)	MW
Halanga	181	MW
Chiscani*	181	MW
Govora*	100	MW
<b>TOTAL</b>	<b>3 487</b>	<b>MW</b>

\* based on the data in corresponding investment proposals

The following electricity generation is foreseen in new CCGTs listed in the investment proposals:

Source description	Quantity	Unit
Gas-fired power generated in Isalnita	5 508 000	MWh
Gas-fired power generated in Turceni	3 078 000	MWh
Gas-fired power generated in Mintia	11 016 000	MWh
Gas-fired power generated in Halanga	1 172 880	MWh
Gas-fired power generated in Chiscani*	1 172 880	MWh
Gas-fired power generated in Govora*	648 000	MWh
<b>TOTAL</b>	<b>22 595 760</b>	<b>MWh</b>

\* based on the data in corresponding investment proposals.

Based on the information available in the NECP, the assumption is made that the existing coal based electricity demand could be covered by the installed capacity of Işalnița, Turceni and Mintia (400 MW) CCGTs.

Halânga CCGT is not included in the NECP, and its capacity is not required for the current electricity demand to be replaced.

From the perspective of determining the GHG reduction, the EIB assumes that from 22.6 TWh of electricity generated in the above gas fired plants, 10.21-12.7 TWh/y will replace electricity generated in coal fired plants. The remaining electricity generated from gas will replace electricity currently generated in other gas fired plants.

Based on the above, EIB understands that for the purposes of the designed capacity of the pipeline an estimated maximum natural gas volume of 2.5 bcm/year (based on an electrical efficiency of approximately 54.9% to 57.5% and 100% load factor) can be considered as required for enabling gas supply to CCGTs that can contribute to GHG reductions i.e. the displacement of TWh generated using coal.

The proposed pipeline is of 12 bcm/year technical capacity [...].

	bcm/y	% of line section capacity
Total line capacity:	12	
Section 1 Marea Neagră – Amzacea, length: 32,4 km, diameter: Ø48” (Dn1200)	12*	
Section II, Amzacea – Podișor, length: 275,7 km, diameter: Ø40” (Dn1000)	9*	
Capacity requested by the Black Sea blocks title holders	8.176	
Capacity to enable coal fired electricity generation replacement (Turceni (475 MW), Isalnita (850 MW), Mintia (400 MW))	2.5**	20.8% of Section 1 27.8% of Section 2

\* Based on the information submitted by Ionut Micu by email on 07/03/2023

\*\* Will vary depending on actual efficiency and mode of operation

From the above it is concluded that the capacity relevant to the Modernisation Fund objectives (enabling expected greenhouse gas reductions) constitutes:

- 20.8% of the 1 Section capacity and
- 27.8% of the 2 Section capacity.

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 can be somewhat mitigated by using the pipes for an increased share of green hydrogen.

In this due diligence, the EIB did not analyse, and does not provide opinion, on the overall required gas fired electricity generation capacity in Romania.

The key purpose of the due diligence is to determine if and how the investment proposal objectives are relevant to the MF support (respecting Article 10d(1) of the ETS Directive) by undertaking this technical, financial and GHG assessment.

[...]

## **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 modernisation of energy networks.

### 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 CCGT plants mentioned in the National Energy and Climate Plan 2021-2030 (NECP), namely: Isalnita, Turceni and Mintia (400 MW), which will replace electricity generated the lignite-based units.

The NECP states that to secure production that meets the consumption demands domestically, thus enhancing energy security and the flexibility of the energy system, Romania's priority is to initiate the investment for the development of a new gas-fired mixed cycle energy capacity in the North-West area (Mintia) with an installed capacity of 400 MW.

The EIB notes that the NECP foresees much lower capacity of the CCGT in Mintia than it is assumed in the investment proposal (400 MW vs 1 700 MW). The NECP also states that the main objective of the plant in Mintia is energy security and flexibility of the system. It is noted that energy security is not an eligibility criterion under Article 10d(1) or 10d(2) of the ETS Directive.

Taking into consideration project objectives listed in the IPSF and the scope of the investment, EIB believes that only a proportion of the created gas transmission capacities (see Section 1: Scope) may contribute to transition from more carbon intensive fossil fuels and hence GHG emission reductions. However, there will be a certain gas volume supplied to the network that is not expected to contribute to GHG reductions but would address other objectives such as security of supply and diversification.

[...]

### 3.2 GHG assessment

The investment proposal claims that implementation of the Black Sea – Podisor transmission pipeline will result in CO<sub>2</sub> reductions of 1 162 563 t/year (1 197 440 t/y if the pipeline will transmit 10% of green hydrogen). Replacement of coal electricity generation with natural gas generation is the main source of GHG reduction by the proposed investment.

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
				<b>20 774 880</b>

- b) The new pipeline will supply natural gas from the Neptun Deep gas field.
- c) The production of electricity from natural gas will replace generation of electricity from lignite from the below coal power plants.

Existing Coal 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
<b>Total</b>				<b>18 085 680</b>

- d) The emissions of CO<sub>2</sub> per MWh of electricity are as follows:

Natural gas specific emissions (tCO <sub>2</sub> /MWh)	0.38419	ton/MWh
Lignite-specific emissions (tCO <sub>2</sub> /MWh)	0.82318	ton/MWh

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

Coal	Natural gas
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Coal PP	MWh/y	tCO <sub>2</sub> /MWh	tCO <sub>2</sub> /y	CCGT	MWh/y	tCO <sub>2</sub> /MWh	tCO <sub>2</sub> /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
			<b>14 887 770</b>				<b>7 981 501</b>

- f) Additionally, to CO<sub>2</sub> 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 CH<sub>4</sub>/km/year (applied CO<sub>2</sub> 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 pipelines	7 884.00
Storage compressor station CO <sub>2</sub> emissions	39 117
<b>Total (t CO<sub>2</sub>/y)</b>	<b>83 016.01</b>

- g) Total GHG emission reduction based on the above assumptions would be 14 887 770 – 7 981 501 – 83 016.01 = 6 823 253 t/CO<sub>2</sub>.
- h) The total investments cost claimed as necessary to achieve the above reductions of CO<sub>2</sub> 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 - Podişor	[...]	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%
	<b>TOTAL</b>	[...]	<b>25.51%</b>

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

- i) The CO<sub>2</sub> reduction allocated to this section of the pipe is 1 162 563 tCO<sub>2</sub>/year.
- j) Additional 3% of the above amount was assumed as CO<sub>2</sub> savings resulting from the fact that pipe can transmit 10% of hydrogen, which altogether gives 1 197 440 tCO<sub>2</sub>/year.

#### EIB Opinion:

The calculation of greenhouse gas emissions was based on a methodology that includes emissions with and without the project.

The values related to the emission factors, per each fuel, used in the calculation methodology are the values taken from the Annual Report of the National Energy Regulatory Authority of Romania for 2021, page 73. EIB has had the indicators checked and they appear reasonable.

In the calculation of GHG emissions, the total installed power generation capacities at the four CCGTs (Işalnița, Turceni, Mintia and Halânga) were considered, which are about 415 MW higher than the replaced coal generation capacities. There is no clear explanation for the increase in power plant capacity.

The distribution of GHG emission reductions was done in the IPSF by referring to the share of CAPEX related to each project in relation to the total investment value (power plants + pipelines). The proposed approach is found to be acceptable by the EIB.

In the IPSF methodology, an efficiency of 63% was considered for Işalnița, Mintia and Halânga CCGT and an efficiency of 59.7% for Turceni CCGT. An operating time of 8 100 hours/year was considered at an average load of the electricity-generating turbines of 80% for the baseline and a new generation was applied. Compared to the current level of electricity production, the proposed operating hours are overestimated. Electricity production from coal in 2021 according to ARNE report was 10.21 TWh, or average of 12.7 TWh/y (2017-2021). The baseline calculated in GHG equals to 18.08 TWh and is higher than actual electricity production from coal. New electricity production is calculated at the level of 20.77 TWh and doesn't correspond to the Gross electricity production forecast according to Romania's draft Energy Strategy for 2020-2030 with the 2050 outlook.

The production of electricity from gas will be reduced from 13.3 TWh in 2020 to 11.2 TWh in 2030. Therefore, the proposed new electricity generation provided in the GHG emissions does not appear to align with Romania's draft Energy Strategy for 2020-2030 figures referred in the IPSF.

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 one approach is to consider a like-for-like replacement of electricity generated by coal with electricity generated by gas. However, such approach would also result in an overestimated GHG reduction as it foresees that all coal-based electricity would be replaced by gas and doesn't give a possibility for future replacement of coal-generated electricity by renewables.

There is a concern that investments in natural gas network may have a lock in effect for fossil fuels in the Romanian energy mix for a longer period.

The capacity of the Black Sea – Podișor transmission line is significantly higher than needed to replace electricity volume currently generated in coal fired plants. Therefore, there is no justification to consider total capacity of the planned pipeline as enabling GHG emissions reductions.

Given that there is no visibility on the timeline for the availability of green hydrogen, there is currently no basis to quantify GHG emission reduction resulting from the potential to blend hydrogen with natural gas and transport it by transmission pipes.

Based on the above comments, in the opinion of the EIB, the claimed CO<sub>2</sub> reductions of the overall investment programme of 6 823 252 t/year appear overestimated.

The EIB is also not in position to confirm that the attribution of 25.51% (1 162 563 tCO<sub>2</sub>/y) of potential GHG emissions reduction, to three projects related to construction of natural gas pipelines (Black Sea – Podișor, Ghercesti – Jitaru, Jupa – Prunisor), can be substantiated based on the information provided.

At a generic level it can be assumed that:

- power generated in CCGTs in Turceni, Isalnita and Mintia (400 MW) would contribute to enabling the replacement of the power generated in coal fired plants and therefore would potentially enable GHG emission reductions.
- Power generated in remaining CCGTs would be expected to replace existing gas fired power sources and therefore would not contribute to the objective to reduce GHG emissions.
- Actual GHG emission reductions resulting from the proposed pipeline itself would however 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.)	[...]	[...]
<b>Total investment cost</b>	[...]	[...]

[...]

### 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 one approach is to consider a like-for-like replacement of electricity generated by coal with electricity generated by gas. As such, only Isalnita, Turceni and Mintia (400 MW) CCGTs could be considered, with some level of certainty, as contributing to GHG emission reductions for the reasons below.

According to the provisions of the NECP, the capacities of Isalnita, Turceni and Mintia (400 MW as opposed to 1 700 MW stated in the IPSF) could be assumed to be relevant for the contribution of the MF objectives. Those CCGTs would be of sufficient capacity to replace existing electricity generation in coal fired plants.

The existing coal-based electricity demand could be covered by Isalnita, Turceni and Mintia (400 MW) CCGTs.

Considering the above approach, only gas volumes enabling operation of the above CCGTs could be considered as contributing GHG emission reductions.

Halanga CCGT is not included in the NECP and its capacity would not be required to replace current coal-based electricity production.

It is estimated that maximum gas volume required to operate Isalnita, Turceni and Mintia (400 MW) at full capacity is 2.5 bcm/y.

EIB notes that Romania has increased the requested MF support by 2.4 times (that is by EUR 183 820 773) since the last Investment Proposal Submission in August 2022. The documentation does not elaborate on the reason for the above substantial change in the requested support from the MF. The EIB cannot confirm that the validity of the increased cost is justified.

As established in Section 1 of this report, capacity of the pipeline relevant to GHG emission reductions is as follows:

- 20.8% of the 1 Section capacity and
- 27.8% of the 2 Section capacity.

It is assumed that:

- 1 Section represents 10.4% of the eligible CAPEX, that is 46 927 226 EUR
- 2 Section represents 89.6% of the eligible CAPEX, that is 404 747 323 EUR

The costs of the project that can be reasonably estimated to replace coal-fired electricity can be taken as follows:

- 1 Section: 9 776 505 EUR (46 927 226 EUR x 20.8%)
- 2 Section : 112 429 811 EUR (404 747 323 x 27.8%)
- Total : 122 206 317 EUR (9 776 505 EUR + 112 429 811 EUR).

The allowable funding from the MF would then be up to € 85 544 422 (70% x € 122 206 317).

[...]

### **13. The final EIB conclusion**

Pursuant to Article 7.2 of the Implementing Regulation, 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, EIB endorses a partial financing of the Investment Proposal "Gas Transmission Pipeline Black Sea - Podisor" 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 85 544 422. The final decision on financing the investment proposal rests with the Investment Committee.