

**DOCUMENT OF THE EUROPEAN BANK  
FOR RECONSTRUCTION AND DEVELOPMENT**

Approved by the Board of Directors on 24 April 2024<sup>1</sup>

**NORTH MACEDONIA**

**Regional Gasification Project**

*[Redacted in line with the EBRD's Access to Information Policy]*

*[Information considered confidential has been removed from this document in accordance with the EBRD's Access to Information Policy (AIP). Such removed information is considered confidential because it falls under one of the provisions of Section III, paragraph 2 of the AIP]*

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<sup>1</sup> As per section 1.4.8 of EBRD's Directive on Access to Information (2019), the Bank shall disclose Board reports for State Sector Projects within 30 calendar days of approval of the relevant Project by the Board of Directors. Confidential information has been removed from the Board report.

For the avoidance of any doubt, the information set out here was accurate as at the date of preparation of this document, prior to consideration and approval of the project.

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## ABBREVIATIONS / CURRENCY CONVERSIONS

bcm	Billion cubic meters
CAPEX	Capital Expenditure
CBA	Cost Benefit Analysis
CF	Cash Flow
CHP	Combined Heat and Power
COVID	Coronavirus disease
CO2	Carbon dioxide
DSCR	Debt Service Coverage Ratio
E&S	Environmental and Social
EBIT	Earnings Before Interest and Tax
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortisation
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
ENTSO-E	European Network of Transmission System Operators
EPC	Engineering, procurement, and construction
ESAP	Environmental and Social Action Plan
ESDD	Environmental and Social Due Diligence
ENTSO-E	European Network of TSO
EUR	Euro
EURIBOR	European Interbank Offered Rate
FiT	Feed-in Tariff
GDP	Gross Domestic Product
GW	Gigawatt
IFI	International Financial Institution
IFRS	International Financial Reporting Standards
KPI	Key Performance Indicator
MW	Megawatt
MWe	Megawatt Energy
ND	Net Debt
Nm3	Normal Cubic Meter
RAB	Regulated Asset Base
RES	Renewable Energy Sources
TC	Technical Cooperation
USD	United States Dollar
WBIF	Wester Balkan Investment Framework

## PRESIDENT'S RECOMMENDATION

This recommendation and the attached Report concerning an operation in favour of NOMAGAS (the “Company” or the “Borrower”), a company incorporated in North Macedonia, are submitted for consideration by the Board of Directors.

The facility will consist of a sovereign-guaranteed loan to the Company in the amount of up to EUR 98.6 million. The loan will comprise (i) a committed first tranche of up to EUR 66.34 million for the construction of 100% hydrogen ready gas interconnection pipeline with Greece (66km in North Macedonia; Interconnection) and national gas transmission pipeline from Sveti Nikole to Veles (28km; Section 2), and (ii) uncommitted second tranche of up to EUR 32.25 million for national gas transmission pipeline from Gostivar to Kicevo (34km; Section 1). The Interconnection will be co-financed with a EUR 12.35 million investment grant from the WBIF and a parallel loan in amount of EUR 28.9 million from the EIB. The loan will be sovereign-guaranteed by North Macedonia through the Ministry of Finance.

In 2019, North Macedonia adopted an ambitious Energy Strategy (“The strategy for energy development of the Republic of North Macedonia until 2040”) to phase out all existing coal-fired power plants by 2030. In order to achieve this target, the Project will provide new gas supply, which will help to accelerate the coal phase-out and allow faster replacement of coal generated electricity with 1.7 GW of electricity generated by renewables by 2030, in full accordance with the goals of the Paris Agreement. The Project will diversify the sources of natural gas and is critical to ensure security of supply. The Project is expected to reduce air pollution and GHG emissions, by enabling the switch to cleaner fuels in populated industrial areas of the country. Natural gas is identified in the National Energy and Climate Plan (“NECP”) as an important transition fuel for achieving the target of net 82% reduction in greenhouse gas emissions by 2030. In accordance with the Bank’s Energy Sector Strategy (2024 – 2028), a CBA was commissioned concluding the Project is consistent with a low carbon transition and Paris Agreement goals.

North Macedonia adopted the Just Transition Roadmap (supported by the EU and EBRD) in June 2023, ensuring protection of vulnerable people and communities. This was recognised and supported by the Climate Investment Funds (CIF) and North Macedonia became pilot country for the Accelerating Coal Transition (ACT) Programme. The EBRD also helped to develop and signed with the government of North Macedonia and other partner institutions (EIB, KfW, World Bank, IFC, CIF, CEB and CDP), at COP 28, a Joint Declaration, for in-country platform for North Macedonia to mobilise EUR 3 billion by 2030 and ensure just and accelerated coal transition.

The expected transition impact of the Project stem from the Integrated and Resilient qualities. The Project is expected to reduce infrastructure bottlenecks in the gas market and contribute to the gasification of central and southwest regions of North Macedonia, which are currently not linked to the national gas network. The Project will achieve diversification of gas supply and enhance energy security of the country. The Company will also update its Human Resources policy to include clear commitments on non-discrimination, equal opportunities, prevention of Gender-Based Violence and Harassment (“GBVH”) and mandatory trainings for its employees (Gender SMART Tag). TC support for this operation has been provided by the EBRD’s Shareholder Special Fund (“SSF”) for Environmental and Social Assessment and support for disclosure of the ESIA study.

[REDACTED].

I am satisfied that the operation is consistent with the Bank’s Strategy for North Macedonia, the Energy Sector Strategy, the Strategy for the Promotion of Gender Equality, and with the Agreement Establishing the Bank.

I recommend that the Board approve the proposed loan substantially on the terms of the attached Report.

**Odile Renaud-Basso**

## BOARD DECISION SHEET

<b>North Macedonia - Regional Gasification Project - DTM 51747</b>	
<b>Transaction / Board Decision</b>	Board approval <sup>2</sup> is sought for a sovereign-guaranteed loan of up to EUR 98.6 million in favour of NOMAGAS (the “Company” or the “Borrower”). The loan proceeds will be used for the construction of a 100% hydrogen ready (i) natural gas interconnection pipeline with Greece (66km; Interconnection) and (ii) two natural gas transmission pipelines, Gostivar to Kicevo (34km; Section 1) and Sveti Nikole to Veles (28km; Section 2) in North Macedonia. The financing of the Interconnection has secured a EUR 28.9 million parallel loan from the European Investment Bank (“EIB”) and EUR 12.35 million investment grant from Western Balkan Investment Framework (“WBIF”). The EBRD loan will include a committed tranche of up to EUR 66.34 million, for the Interconnection and Section 2, and an uncommitted tranche of up to EUR 32.25 million, for Section 1, which will be subject to a separate Board approval, once the ESIA for Section 1 is disclosed.
<b>Client</b>	NOMAGAS is a regulated gas transmission system operator, fully owned by the government of North Macedonia, which operates 0.8 bcm interconnector with Bulgaria and has 365km transmission lines (195 km operational and 170 km under construction). In 2022, NOMAGAS had revenues of EUR 5.1m (EUR 7.8m in 2021), net loss of EUR 1.3m, total assets of EUR 240m and equity of EUR 54m.
<b>Main Elements of the Proposal</b>	<p><b>Transition impact:</b> <i>Integrated:</i> The Project is expected to reduce infrastructure bottlenecks in the market and contribute to the gasification of central and southwest part of North Macedonia, which are currently not linked to the national gas network; <i>Resilient:</i> The Project will achieve diversification of gas supply in North Macedonia through the Trans Adriatic Pipeline (“TAP”) and Liquefied Natural Gas (“LNG”) terminals in Greece. This will improve competitiveness and reduce gas prices (North Macedonia relies only on Russian gas from Trans Balkan Pipeline (“TBP”), through increasing gas supply capacity by 2.5 times (from existing 0.8 bcm to 3.6 bcm) and thereby further support decarbonisation at lower cost of supply.</p> <p><b>Additionality:</b> EBRD offers financing that is not available in the market from commercial sources on reasonable terms and conditions, [REDACTED] restricted foreign currency financing etc. Such financing is necessary to structure the Project. <b>Gender Tag:</b> The Company will also enhance its gender standards in line with international best practice.</p> <p><b>Sound banking:</b> The Project is a loan guaranteed by the Republic of North Macedonia, rated BB- (Stable) by S&amp;P on 29 January 2024 and BB+ (Stable) by Fitch on 8 November 2023.</p>
<b>Key Risks</b>	<b>Reputation risk</b> arising from fossil fuel exposure. <i>Mitigation:</i> The Project is Paris Aligned and consistent with the Energy Sector Strategy (2024-2028), given that (i) it is aligned with ambitious and credible low carbon country strategy, (ii) is 100% hydrogen ready at the onset, (iii) will substantially improve air pollution and reduce GHG emissions, and (vi) will accelerate coal-fired power plants phase-out and will not delay rapid deployment of renewables.
<b>Strategic Fit Summary</b>	The Project is aligned with the Bank's Strategy for the Republic of North Macedonia, key objective for improved connectivity and integration of key transport and energy infrastructure. It is also consistent with the Energy Sector Strategy, and the Strategy for the Promotion of Gender Equality.

<sup>2</sup> Article 27 of the AEB provides the basis for this decision.

## ADDITIONAL SUMMARY TERMS FACTSHEET

<b>EBRD Transaction</b>	<p>Sovereign guaranteed loan of up to EUR 98.6 million to NOMAGAS, a state-owned company, to co-finance hydrogen ready gas interconnection pipeline with Greece (66km; Interconnection) and two natural gas transmission pipelines, Gostivar to Kicevo (34km; Section 1) and Sveti Nikole to Veles (28km; Section 2). The financing of the Interconnection has secured a EUR 28.9 million parallel loan from EIB and EUR 12.35 million investment grant from WBIF. The EBRD loan will include:</p> <ul style="list-style-type: none"> <li>• committed tranche of up to EUR 66.3 million, for Interconnection and Section 2, and</li> <li>• uncommitted tranche of up to EUR 32.25 million, for Section 1, which is subject to separate and subsequent Board approval, conditioned to ESIA disclosure.</li> </ul>
<b>Existing Exposure</b>	<p><u>Direct Exposure:</u> None  <u>Sovereign Exposure:</u></p> <ul style="list-style-type: none"> <li>• Sovereign portfolio: EUR 918 million</li> <li>• Sovereign operating assets: EUR 308 million</li> </ul>
<b>Maturity / Repayment</b>	<p><u>Tranche 1:</u> up to 15 years [REDACTED].  <u>Tranche 2:</u> Subject to separate and subsequent approval by the Board, up to 15 years [REDACTED].</p>
<b>Potential AMI eligible financing</b>	N/A
<b>Use of Proceeds</b>	<p>The loan proceeds will be used for the construction of the Interconnection and Section 1 and Section 2. The Interconnection will increase the gas supply capacity by 2.8 bcm (2.5 times of the existing capacity) and will allow diversification of supply of natural gas in North Macedonia, away from Russia. When constructed, Section 1 will allow natural gas supply to the city of Kicevo, in the west part of the country, but most importantly it will allow for further development to complete the gas ring in the country and supply gas to the southeast region. Section 2 will supply natural gas to the industrial city of Veles, in the central part of the country. Part of the proceeds will also be used for project implementation support and environmental and social assessments and monitoring, against standard condition precedents.</p>
<b>Investment Plan</b>	[REDACTED]
<b>Financing Plan</b>	[REDACTED]
<b>Key Parties Involved</b>	<ul style="list-style-type: none"> <li>• NOMAGAS – Borrower;</li> <li>• Republic of North Macedonia represented through the Ministry of Finance – Guarantor.</li> <li>• EIB, WBIF – Co-Lenders (WBIF via an investment grant)</li> </ul>
<b>Conditions to subscription / disbursement</b>	Standard for sovereign guaranteed loans including corporate documents, financing documents, guarantee agreement and compliance with ESAP for project preparation activities;
<b>Key Covenants</b>	[REDACTED]
<b>Security / Guarantees</b>	Sovereign guaranteed – Republic of North Macedonia (Fitch: BB+/S&P: BB-).
<b>Other material agreements</b>	Guarantee Agreement with Republic of North Macedonia, through the Ministry of Finance
<b>Associated Donor Funded TC and Blended Concessional Finance</b>	WBIF provided EUR 2.45 million of technical assistance grant to NOMAGAS, for feasibility study, ESIA, design, supervision and project implementation support. Separately, the WBIF provided investment grant in an amount of EUR 9.9 million. EIB is the lead IFI for both the technical assistance and the investment grant, helped

	develop the Project from the beginning and have already signed the loan agreement in December 2021.
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[REDACTED]

# 1. INVESTMENT PROPOSAL SUMMARY

## STRATEGIC FIT AND KEY ISSUES

### 1.1 STRATEGIC CONTEXT

#### *Need for energy sector transition*

The energy market in North Macedonia faces significant challenges. Power generation still relies heavily on inefficient and outdated coal-fired generation (c.50%) while conventional hydropower generation represents c.20% of electricity production (depending on the volatile hydrological conditions). North Macedonia also ranks among the most energy-intensive economies in southeast Europe, due to a combination of energy-intensive local industries, poorly insulated buildings, inefficient heating systems and large distribution losses. The energy sector structure is therefore resulting in serious inefficiencies in how energy and heat are delivered. Households mostly use individual form of heating dominated by solid fuels (firewood and coal – c.65%). A quarter of heat demand is provided with electricity, which is highly inefficient and exacerbates power supply challenges. Residential heating represents a major air quality concern in the country and has a dominant share in emissions, while the industrial sector contributes around 20% of NOx emissions and 8% of the country's GHG emissions. Air pollution levels are severe: Skopje, Bitola, and Tetovo are among the 10 most polluted cities in Europe. In 2022, average Particulate Matter concentration in North Macedonia were 5.1 times the WHO annual air quality guideline values. This leads to significant health issues, with studies estimating that long-term exposure caused an estimated 3,759 premature deaths from 2016-2020.

#### *Credible low carbon strategy for just transition of the energy sector*

To overcome these challenges, the Macedonian energy sector is now embarking upon a fundamental transformation, ending its reliance on lignite by 2030 and replacing this with renewable energy and a small fleet of significantly less carbon intensive gas generating units. This is the most rapid and ambitious coal phase-out plan in the Western Balkan region.

The country's National Energy Climate Plan ("NECP") aims to achieve a net reduction in greenhouse gas ("GHG") emissions by 82% by 2030 and 90% by 2040 compared to 1990 through: (i) decommissioning of all 0.7 GW of lignite-fired generation capacity by 2030, (ii) 1.7 GW of new renewable generation capacity by 2030 and (iii) investment in associated grid, storage and gas infrastructure investments to ensure energy security. These commitments are also reflected in EBRD's Loan agreement with ESM (SOE for electricity generation), for the Energy Crises Liquidity Support project, and the embedded Action Plan for restructuring of ESM and the Macedonian energy sector.

Building on the NECP, on 13 June 2023, North Macedonia adopted the Just Transition Roadmap (supported by the EU and EBRD). This focusses on ensuring that the green economy transition benefits are shared, while protecting vulnerable people, regions, and communities from falling behind. The roadmap, has four pathways, including 1) private sector investments and start-up economy, 2) green and smart infrastructure, 3) clean energy, and 4) skills development.

The Climate Investment Funds (CIF) selected North Macedonia as Accelerating Coal Transition (ACT) Programme pilot country. In March 2024, the CIF approved USD 85 million concessional funding with an investment plan, estimated at EUR 680 million for the coal affected regions. This is implemented in collaboration with relevant CIF partner multilateral development banks (MDBs), namely, EBRD (lead), World Bank (WB), and International Finance Corporation (IFC).

The EBRD has also helped to develop and promote at COP 28 an in-country platform for North Macedonia to mobilise donor funding and private sector financing to accelerate just energy transition (the "Platform"). Joint Declaration for the Platform was signed on 3 December 2023 between the government of North Macedonia, the EBRD as lead IFI, and other partner institutions, including EIB, KfW, World Bank, IFC, CIF, CEB and CDP. The Platform has an objective to invest EUR 3 billion by 2030, to: (a) support coal phase out; (b) ensure deployment

of 1.7GW of renewable energy, (c) support associated grid and storage investments and enable energy security, and (d) ensure just transition for coal-reliant and vulnerable communities.

In addition to the above, EBRD's holistic support remains central to the green transition of the energy sector in North Macedonia. The Bank has financed the first 40MW large scale solar PV plants with ESM (SOE for power generation) on the coal mines next to the TPP Oslomej and TPP Bitola and showcased a sustainable solution for transition from coal. The Bank is considering project financing of two large scale private PV plants (pre-FRM – OpID: 54092 and OpID: 54199) with 240 MW installed capacity combined. EBRD has already provided technical assistance in 2019 to establish an auctioning scheme for 35MW solar PV on public land and 27MW solar PV on private land and further supported ESM and the government to run a Public Private Partnership tender for a 100MW solar PV at the Oslomej coal mine. The auction was successful and two large scale PV plants (50MW each) are already under construction and expected to connect to the grid in 2024. More recently, the EBRD is supporting the establishment of a new RES Association which will aim to facilitate the dialogue between all stakeholders in the energy sector toward proliferation of new RES.

The EIB signed the loan agreement for financing of the Interconnection in December 2021 and is the lead IFI for the WBIF technical assistance and investment grant. The Interconnection will be procured following EIB procurement rules given its earlier involvement in the Project. EIB has already contracted the PIU and supervision consultant and on 24 November 2023 published the tender for EPC Contractor for construction of the Interconnector.

### ***Project benefits and alignment with the Energy Sector Strategy (2024-2028)***

The Project will **diversify the gas supply to North Macedonia**, enabling access through the Trans Adriatic Pipeline (“TAP”) and LNG terminals in Greece. This will improve competitiveness and reduce gas prices (North Macedonia relies only on Russian gas from Trans Balkan Pipeline “TBP”), through increasing gas supply by up to 2.8 bcm (existing 0.8 bcm). The primary objective of the TAP project was to provide an opportunity to supply the Western Balkans with an alternative supply of natural gas and support decarbonisation in the region (EBRD's EUR 500 million loan in 2018 OpID: 45690). A new interconnection to North Macedonia, would also enable supply of natural gas to Serbia. These relatively short interconnections will help overcome energy challenges of coal dependency and are essential in achieving natural gas supply diversification in the region. The Bank is also the lead IFI for the WBIF funded feasibility study and ESIA for the interconnections with Serbia.

Supply of **natural gas is recognized as a transition fuel in all strategic climate and energy documents**, such as the Macedonian Energy Strategy (prepared with support from the UK GGF) and NDC (prepared with support from the UNDP) and is identified clearly in the NECP (supported by GIZ and prepared in collaboration with the Energy Community Secretariat). The Project applies the best available techniques and meets the highest environmental and social standards, including (i) designed and operated to fully meet the new EU Methane Strategy in terms of monitoring, reporting and abatement of methane emissions (North Macedonia has already joined the Global Methane Pledge), and (ii) designed and constructed to transport 100% low carbon hydrogen.

The Project is expected to **substantially improve air pollution and reduce GHG emissions**, by enabling the switch to cleaner fuels in densely populated industrial areas of the country. The Project provides new sources of gas to North Macedonia which will directly displace more polluting fuels in industry, power generation and commercial and households sectors. Gas is expected to be used to replace the use of oil/petroleum products (mainly in the food industry, building materials industry and other manufacturing) and coal/solid fuels (mainly in the metallurgy) in the industrial sector and inefficient form of individual heating in the commercial and residential sectors (mainly solid fuels such as wood), which are largely responsible for serious air pollution. Gas investments facilitate the transition from coal, including the closure of the existing coal fired TPPs in Bitola and Oslomej by 2030.

The Project **will not prevent or delay the introduction of renewable energy or low carbon solutions**. The investments in gas will facilitate the transition from coal, including the closure of the existing coal fired TPPs in Bitola and Oslomej by 2030 and gasification of industry. The new energy strategy relies heavily on variable

renewable energy sources and a secure and stable natural gas supply will allow for base load power production and accordingly secure and reliable power system.

The Project is assessed as **Paris Aligned and consistent with the Energy Sector Strategy (2024-2028)** (see Annex 3 for further details). An economic assessment shows that the economy can reach net zero emissions by 2050 with the proposed investments and that the resulting gas expansion will accelerate the pace of decarbonisation by enabling the substitution of coal, oil and solid fuels in households, commercial buildings, industry, and the power sector. The analysis considers a project scenario and electrification scenario (project alternative) and a counterfactual. The Project shows material economic benefits relative to both the counterfactual and the electrification scenario, with expected net benefits of NPV EUR 27 billion (EUR 18.4 billion electrification scenario). This is driven by substantial savings in direct GHG emissions and direct air quality as gas substitutes coal, fuel oil and solid fuels. Reductions in GHG emissions and air pollution crucially occur before 2040 and faster and more significantly compared to electrification scenario. This is mainly because an electrification scenario takes longer to phaseout coal of the energy mix and has higher switching costs. Sensitivity analysis shows the project scenario performance is robust to changes in all key variables including gas price increase (sensitive only to extreme and sustained swings in natural gas prices more than 500% change). The overall level of carbon lock in risk is assessed in detail, and considering mitigations, is determined to be low and acceptable. The Project is aligned with the Agreement Establishing the Bank, the Bank's Strategy for the Republic of North Macedonia and its key objective for improved connectivity and integration of key transport and energy infrastructure in North Macedonia. It is also consistent with the new Energy Sector Strategy, by financing fossil-fuel project with a strong ambition to accelerate the low-carbon transition in North Macedonia and actively contributes to the goals of the Paris Agreement.

## 1.2 TRANSITION IMPACT

### Primary Quality: Integrated

Obj. No.	Objective	Details
1.1	<i>The project is expected to solve or improve significant infrastructure bottleneck(s) on the market and/or contribute to the gasification of some areas which are currently not linked to the national gas network.</i>	The new interconnection with increased capacity and diversified supply will allow gasification of the entire country and provide possibility to supply Serbia. The two in-country sections will firstly provide gas supply to the cities of Kicevo and Veles, but will also allow completing the gas ring in the country and supply of gas in multiple other cities.

### Secondary Quality: Resilient

Obj. No.	Objective	Details
2.1	<i>The country has a serious and confirmed threat to supply security (as measured by a confirmed N-1 gap) and the project helps address it, in full or in part.</i>	North Macedonia has only one gas interconnection with Bulgaria, with capacity fully booked by Russian gas. Moreover, the capacity 0.8bcm is limited and does not allow wider use of natural gas required for energy transition.

2.2	<i>The technology introduced by the project is in line with international BAT, has never been deployed in this country and is not prevalent in the EBRD region (&lt;2 examples of its deployment).</i>	The new gas pipelines are designed from the onset and will be constructed to be 100% hydrogen ready.
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### 1.3 ADDITIONALITY

Identified triggers	Description
<i>No triggers identified</i>	<i>n/a</i>

Additionality sources	Description of additionality sources
<b>Financing Structure</b> EBRD offers a <b>tenor</b> , which is above the market average and is necessary to structure the Project.	EBRD provides long-term financing of 15 years [REDACTED] which is not readily available in North Macedonia from local commercial banks for such a project.
<b>Risk Mitigation</b> EBRD's ability to absorb risk in a certain country/region, where other <b>IFIs/commercial financiers reached their limit exposure</b> .	Commercial banks do not offer and IFIs (like the EIB) cannot further extend financing for gas infrastructure projects. EBRD is the only IFI which, after carefully designing and assessing against the stringent requirements and limitations for fossil fuel projects, can finance the gap of the Project and ensure implementation of the gas infrastructure, which is essential for a low-carbon transition and energy security, while accelerating the deployment of renewable energy.
<b>Standard-setting</b> Borrower seeks/makes use of EBRD expertise on <b>best international procurement standards</b>	The Borrower will benefit from the Bank's expertise and guidance with regards to implementing Bank's PP&R and thereby achieve the optimal result with regards to procurement. The application of EBRD PP&Rs will ensure that an experienced and qualified contractor is selected to perform the work.
<b>Gender SMART Tag</b> Borrower seeks/makes use of EBRD expertise on <b>gender standards and/or equal opportunities action plans</b>	The Borrower commits to update its Human Resources policy to include clear commitments on non-discrimination and equal opportunities, as well as on the prevention and addressal of Gender-Based Violence and Harassment (GBVH) in line with the guidelines set in EBRD's GBVH toolkit. To raise awareness across its employees, the Borrower will also introduce a mandatory training for staff and management on these new corporate commitments on gender equality.

## 1.4 SOUND BANKING - KEY RISKS

<b>Risks</b>	<b>Probability / Effect</b>	<b>Comments</b>
<i>Project specific risks</i>		
<b>Counterparty Creditworthiness</b>	<b>Low/High</b>	[REDACTED] <i>Mitigation:</i> NOMAGAS is state-owned, regulated TSO, and therefore of great systemic importance. The government made a decision to convert all outstanding debt toward the Ministry of Finance into equity and NOMAGAS will have no outstanding debt. The transmission tariff is fully regulated and RAB based, so the investment in the Project will be fully recovered and support the debt service. The loan will be sovereign guaranteed by the Republic of North Macedonia.
<b>Construction and cost overrun risk</b>	<b>Medium/High</b>	[REDACTED] <i>Mitigation:</i> An experienced EPC contractor will be selected for the construction of each section. The procurement plan for the Project is be developed in close cooperation between the Bank and the Borrower to ensure compliance with the Bank's Procurement Policies and Rules (PP&R). The appointment of an external PIU consultant will assist the Borrower to ensure on-time delivery of the Project. The Interconnection will be procured following EIB procurement rules. EIB has already contracted the PIU and supervision consultant and on 24 November 2023 published the tender for EPC Contractor. The Borrower has sufficient capacity and demonstrated success in constructing and implementing similar projects.
<b>Guarantor Creditworthiness</b>	<b>Low/High</b>	The Bank will rely on creditworthiness of North Macedonia, as the government will provide a full sovereign guarantee for the loan.  <i>Mitigation:</i> North Macedonia is rated at BB+ (Stable) by Fitch, affirmed in November 2023, in light of the country's demonstrated resilience to external shocks and maintained macroeconomic stability, and at BB- (Stable) by S&P, affirmed in January 2024. Public debt to GDP has decreased from 61% in 2021 to 58% in December 2023 and assessed sustainable in the medium term. The government have taken steps to improve debt composition and fiscal consolidation through the implementation of fiscal rules and the establishment of an independent fiscal council. The authorities are relying on external funding to meet liquidity needs, including support from the IMF, EU budget grants, and Eurobond issuances (latest issuance in March 2023 with an oversubscribed 4-year EUR 500 million).
<i>External risks</i>		
<b>Demand risk</b>	<b>Medium/High</b>	Current gas demand is limited because of undeveloped network and limited and undiversified supply.  <i>Mitigation:</i> The government committed to the construction of the national gas distribution system [REDACTED] and the development of the transmission network is well underway.

		This has already led to continuous reduction in gas tariffs thanks to increased transmitted natural gas volume. [REDACTED].
<b>Interest rate and currency risk</b>	<b>Low/Low</b>	<p>The repayment capacity of the Borrower could be affected if EURIBOR increases over the term of the loan and/or by adverse movements in the FX rate.</p> <p><i>Mitigation:</i> The Company is cash positive under normal operating circumstances and has no debt. Cost of debt is recognised in the regulated WACC methodology and adverse changes to the EURIBOR can be recovered through the gas transmission tariff. The currency in North Macedonia (MKD) is pegged to the EUR and fluctuates against the EUR in a very narrow corridor (between 61.5 and 61.7 MKD per EUR, or 0.3% corridor). The revenues and operating expenses are in MKD. Operating expense items are denominated in MKD.</p>

## 2. MEASURING / MONITORING SUCCESS

### TI indicator(s), primary Quality: Integrated

Obj. No.	Monitoring indicator	Details	Baseline	Target	Due date
1.1	Expanded access of natural resources product or services	The Borrower will expand access of natural gas across the country and sectors but will also allow for possible expanded supply in neighbouring countries, which has no supply of gas and Serbia which would get decertified supply.	[REDACTED]	[REDACTED]	[REDACTED]
1.2	Number of individuals (women) with improved access to healthcare	the Project will expand access to natural gas across 17,000 new customers. Specifically, it will introduce services to 5,000 new customers in Kicevo and 12,000 in the Veles region.	[REDACTED]	[REDACTED]	[REDACTED]

### TI indicator(s), secondary Quality: Resilient

Obj. No.	Monitoring indicator	Details	Baseline	Target	Due date
2.1	New or updated technology introduced	The new gas transmission lines will be designed and built to be 100% hydrogen ready	[REDACTED]	[REDACTED]	[REDACTED]

### Additional Indicators

Indicator type	Monitoring indicator	Details	Baseline	Target	Due date
Advisory & Policy Indicators	Practices of the relevant stakeholder improved (equal opportunity)	The Borrower will update its HR policy to include clear commitments on non-discrimination,	[REDACTED]	[REDACTED]	[REDACTED]

	practices of the client)	equal opportunities, and the prevention of Gender-Based Violence and Harassment.			
Advisory & Policy Indicators	Tailored training programme developed and implemented	To raise awareness across its employees, the Borrower will introduce a mandatory training for staff and management on these new corporate commitments on gender equality.	[REDACTED]	[REDACTED]	[REDACTED]
Advisory & Policy Indicators	Tariffs reached the target level	This indicator is part of Resilient quality. The Project will achieve diversification of gas supply in North Macedonia through the Trans Adriatic Pipeline (TAP) and Liquefied Natural Gas (LNG) terminals in Greece. Currently, North Macedonia relies only on Russian gas from Trans Balkan Pipeline (“TBP”). This will improve competitiveness and reduce gas prices [REDACTED].	[REDACTED]	[REDACTED]	[REDACTED]
Advisory & Policy Indicators	Net increase in energy infrastructure usage and/or capacity	This indicator is part of Resilient quality. The Project is expected to increase gas supply capacity by 2.5 times (from existing 0.8 bcm to 3.6 bcm)	[REDACTED]	[REDACTED]	[REDACTED]

### 3. KEY PARTIES

#### 3.1 BORROWER

- Borrower, NOMAGAS is a joint stock state owned company and licenced gas transmission system operator (“TSO”), established in December 2022 from the merger between the two state owned TSOs, National Energy Resources (“NER”) and JSC GA-MA Skopje (**GAMA**).
- NER was a state-owned company established to expand gas transmission network. Over the past five years it has constructed 267km transmission lines, out of which, section Klecovce – Stip - Negotino

(97km) is completed and Sections Negotino - Bitola (92km) and Skopje – Gostivar (78km) are near completion (about 95%).

- **GAMA** was the sole licenced TSO operating the interconnector with Bulgaria and the transmission line to Kumanovo and Skopje (98km). GAMA did not comply with the Third EU Energy Package unbundling requirements because at the time was jointly controlled by Makpetrol (the largest gas importer and supplier in the country) and the state. North Macedonia has acquired Makpetrol’s share in 2021 to allow for the merger and unbundling to take place.
- **NOMAGAS** has total of 365km transmission lines, of which 195km operational and 170km under construction. In 2022, transported 0.28bcm (0.43bcm in 2021 due to gas price), had revenues of EUR 5.1 million and total assets of EUR 240 million. The Company currently has 77 employees.

In EUR million	2020	2021	2022
	NER and GAMA	NER and GAMA	NOAMGAS
	Audited	Audited	Audited
Revenues	6.5	7.8	5.1
EBIT	1.8	2.7	(1.0)
Net Income	1.6	2.3	(1.3)
Non-current assets	194.6	212.8	218.1
Cash	38.3	7.3	15.6
Total Assets	239.7	225.4	240.1
Equity	48.4	51.1	54.5
LT Debt	108.1	83.4	78.5
ST Debt	13.1	20.3	31.8

### 3.2 GUARANTOR

- The Guarantor is the Republic of North Macedonia, represented by the Ministry of Finance. North Macedonia is rated at BB+ (Stable) by Fitch, affirmed in November 2023 in light of the country’s demonstrated resilience to external shock and maintained macroeconomic stability and at BB- (Stable) by S&P, affirmed in January 2024.
- Economy has experienced moderate growth, with a rebound of 3.9% in 2021 followed by a slowdown to 2.1% in 2022 and further reduction to 1.1% in the second quarter of 2023. The contraction of industry and construction activity in 2022 and 2023 is driven by a slowdown in external markets, while investment growth remained robust. Household demand is expected to remain moderate in 2023 due to high inflation rates, and the slowdown in trading partners may affect exports and investor confidence. Despite these challenges, macro financial stability is maintained, supported by a prudent exchange rate regime pegged to the Euro and sizeable international reserve assets. The banking sector has remained stable, well-capitalized, and liquid, with non-performing loans at a low level. Public debt to GDP has increased to 58.4% in December 2023, but decreased from record high 61% in 2021. According to IMF, the public debt is considered sustainable in the medium term with authorities making steps to improve debt composition and fiscal consolidation through the implementation of fiscal rules and the establishment of an independent fiscal council. The authorities are relying on external funding to meet liquidity needs, including support from the IMF (EUR 200 million Precautionary and Liquidity Line, approved by the IMF Executive Board), EU budget grants, and Eurobond issuances in the amount of EUR 1.36 billion.

## 4. MARKET CONTEXT

- Natural gas currently accounts for less than 7% of the country’s energy consumption. 100% of the gas consumed in North Macedonia is imported from Russia and gas transmission infrastructure is limited to a 0.8bcm, 98km pipeline entering the country via Bulgaria to Skopje and adjacent areas. Largest consumption of natural gas is during winter months as natural gas and mostly used by CHP plants in Skopje (76%), followed by industrial consumers (17%) and the local gas distribution companies (7%).

Total consumption in 2022 was 0.28bcm, reducing from 0.43bcm in 2021 due to gas price spike as result of the war in Ukraine.

- In 2022, Bulgarian and Macedonian gas TSOs agreed to increase the capacity of the interconnection by 20% to allow for some level of diversification. However, the Bulgarian TSO did not increase or allocated the capacity to other gas suppliers and Russian gas remained to be the sole supply option. [REDACTED]. North Macedonia, Serbia and Hungary submitted and won the complaints to the European Union and the Energy Community Secretariat because were directly affected and limited to mitigate the additional cost, without any alternative for supply of natural gas.
- There is a 112km gas distribution network in the city of Skopje, Strumica, Kriva Palanka, Kratovo, Kumanovo and the Technology and Industry Development Zone in Skopje. A PPP tender for a gas distribution network for the entire country is supported by the EBRD is at pre final bid.
- New gas interconnection with Greece, with 2.8 bcm capacity and part of the Project, is in the tendering phase. This interconnection will enable delivery of additional and diversified supply of gas from the TAP and the LNG terminals in Greece and is expected to significantly reduce the current gas wholesale prices.
- The natural gas market in North Macedonia was liberalized in 2015. The Energy Law adopted in 2018 transposed the Third Energy Package in the gas sector. Unbundling is now concluded with the purchase of Makpetrol's share in GAMA and the merger with NER.
- The Energy Regulatory Commission (ERC) regulates the market, provides licencing for transmission, distribution, supply and trade, and sets the transmission and distribution tariffs under a RAB based methodology. The tariff methodology has three-year regulatory period with annual re-assessment. Current WACC is 6.02%, but with the change of the WACC methodology in November 2023, new WACC is expected to increase to 6.8% (based on current costs of debt and equity).
- Supply of natural gas is aligned with Macedonian climate and energy policies and is recognized in all strategic climate and energy documents (adopted Energy Strategy (prepared with support from the UK GGF), NDC (prepared with support from the UNDP) and LTS) as the transition fuel which will supports early peaking of GHG emissions. All gas infrastructure, including the Project, are identified clearly in the draft NECP (supported by GIZ and prepared in collaboration with the ECS), which aims for 90% GHG reduction by 2050.
- Gas investments allow for supply of natural gas to facilitate the transition from coal, including the closure of the existing coal fired TPPs in Bitola and Oslomej by 2030 and gasification of industry. The new energy strategy relies heavily on variable renewable energy sources (1.7 GW wind and solar by 2030) and the secure natural gas supply will allow for base load power production and a secure and reliable power system.

## **5. FINANCIAL / ECONOMIC ANALYSIS**

### **5.1 FINANCIAL PROJECTIONS**

[REDACTED]

### **5.2 SENSITIVITY ANALYSIS**

[REDACTED]

### **5.3 PROJECTED PROFITABILITY FOR THE BANK**

[REDACTED]

## 6. OTHER KEY CONSIDERATIONS

### 6.1 ENVIRONMENT

Categorised A (ESP 2019). The National Environmental Impact Assessment (EIA) procedures for the North Macedonia-Greece Interconnector have been completed separately in accordance with the national legislation of each country. The Ministry of Environment and Physical Planning of North Macedonia (MoEPP) issued an environmental approval for the Interconnector in January 2023. An Environmental Impact Study (Elaborate) was prepared for Svete Nikole-Veles pipeline in 2021 and submitted to the MoEPP, which approved it the same year. The review of ESIA studies for both pipelines identified required supplementary studies to address the gaps and ESAP actions required to achieve full compliance with EBRD requirements.

The feasibility and routing studies for the pipeline have considered several routes based on technical, financial and environmental implications. The most feasible alternatives were further assessed in the EIA comparing the duration and magnitude of all potential impacts of available route alternatives. Specific route modifications were adopted to avoid houses, archaeological sites, an Important Bird Area and other protected areas, and recreational areas. When it is not possible to avoid all protected areas, the impacts are mitigated through a variety of measures, such as, for example, minimising the overlapping of the pipeline route with the boundaries of protected areas, seasonal construction limitations during sensitive seasons, narrowing the construction corridor to minimise the impacts, using horizontal directional drilling instead of open cut crossing. In addition, pre-construction biodiversity surveys will be conducted to rule out presence of any protected species in the pipeline construction area. All works in the vicinity of protected areas will be supervised by qualified personnel. All these measures are specified in the Biodiversity Action Plans.

Both pipelines avoid physical resettlement and minimise the use of private land. For the Interconnector, about 75 per cent of the land needed permanently and about 80 per cent of the land needed temporarily, is state-owned. The Sveti Nikole-Veles Section, the state owns about 71 per cent of the land needed permanently and about 70 per cent of that needed temporarily. The negative socio-economic impacts will relate to changes in land use and livelihoods, restricted access to assets, pressure on public utilities, services and infrastructure, nuisance to workers and community health and safety, and potential damage to cultural heritage.

Accident risks will be mitigated through the Supervisory Control and Data Acquisition system (SCADA) that controls flow and pressure, and corrosion protection to prevent pipeline failure using cathodic protection, coatings and linings. Leak detection will also be conducted regularly. The Project will implement an Emergency Preparedness and Response Plan commensurate with the risks of the facility and associated activities for both construction and operations.

The Company's existing environmental and social performance was found to be in line with the requirements of the national legislation. Partial compliance and non-compliance were identified with regards to some EBRD requirements. Existing informal practice for raising grievances and concerns should be formalised and communicated to personnel and contractors, and an overarching Human Resource Policy will need to be developed, and the Borrower will need to prepare and implement a change management procedure. The establishment of an effective E&S management system, including relevant plans and procedures, as well as appointing and training key environmental and social, occupational health and safety and stakeholder engagement personnel, is fundamental to building the E&S management capacity. The Borrower shall ensure that the Company level requirements are included into the relevant contractor management plans that will need to be monitored during the entire construction phase, and that a change management procedure is developed and implemented. The Borrower will also need to enhance its stakeholder engagement practices, to build stakeholder engagement capacity, and to upgrade the existing grievance mechanism to the EBRD requirements. Detailed recommendations to address the identified issues of partial- and non-compliance are in the ESAP. The environmental and social disclosure package has been disclosed for 120-day in October 2022 and the ESAP has been agreed with the Borrower. The environmental and social performance of the Project will be monitored by the Bank through regular site visits.

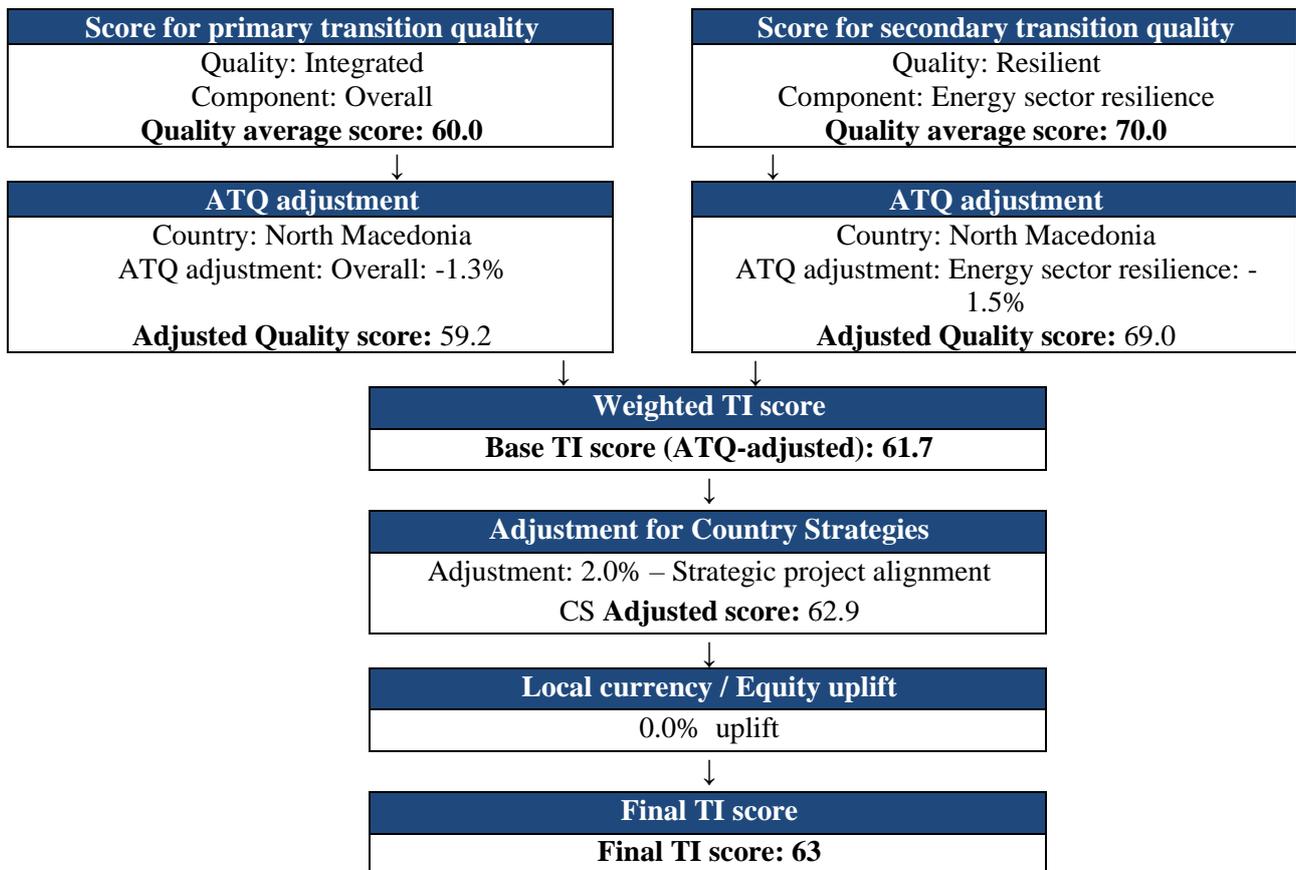
## 6.2 INTEGRITY

In conjunction with OCCO, integrity due diligence was undertaken on the Company, its senior management, and other relevant parties. [REDACTED]. All actions required by applicable EBRD procedures relevant to the prevention of money laundering, terrorist financing and other integrity issues have been taken with respect to the Project, and the Project files contain the integrity checklists and other required documentation which have been properly and accurately completed to proceed with the Project.

**ANNEXES TO OPERATION REPORT**

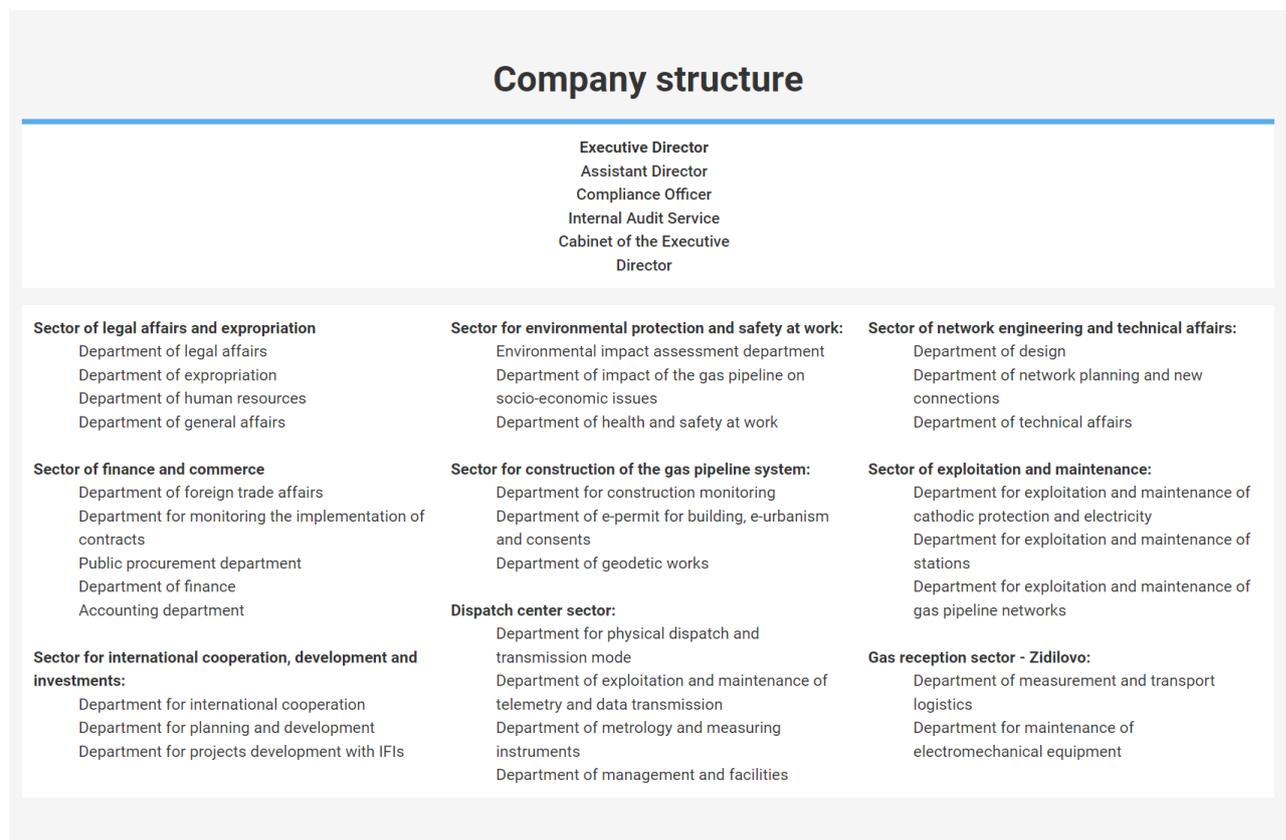
ANNEX 1	TRANSITION IMPACT SCORING CHART
ANNEX 2	SHAREHOLDING STRUCTURE
ANNEX 3	GREEN ASSESSMENTS
ANNEX 4	PROJECT IMPLEMENTATION

## ANNEX 1 - TRANSITION IMPACT SCORING CHART



## ANNEX 2 – SHAREHOLDING STRUCTURE

NOMAGAS is 100% owned by the government of North Macedonia. Below is the organization structure

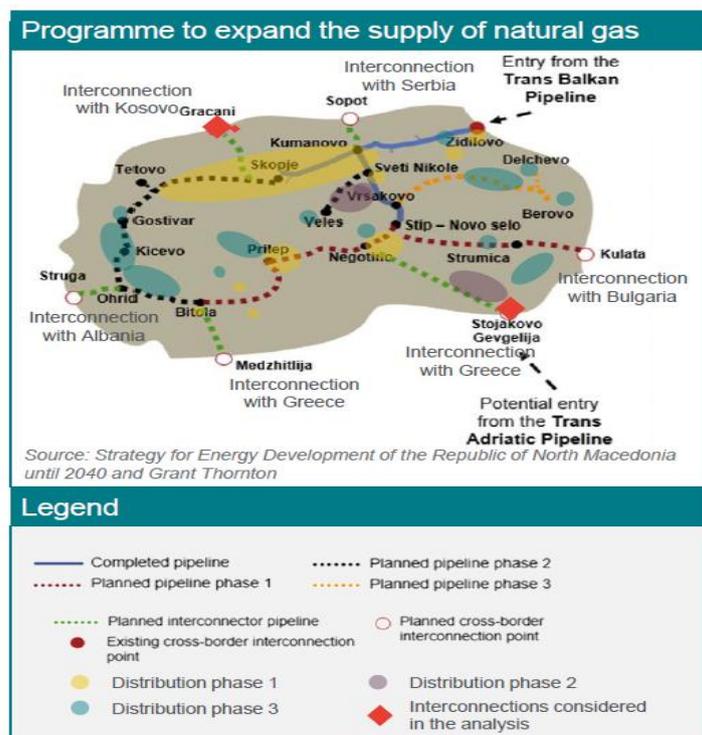


## ANNEX 3 – GREEN ASSESSMENTS

North Macedonia has an energy mix dominated by oil products, coal and fuelwood/solid fuels, which make up nearly 90% of primary energy supply. This energy mix results in high levels of local air pollutants and GHG emissions. Air pollution levels are severe: Skopje, Bitola, and Tetovo are among the 10 most polluted cities in Europe. In 2022, average Particulate Matter concentration in North Macedonia were 5.1 times the WHO annual air quality guideline values<sup>i</sup>. This leads to significant health issues, with studies estimating that long-term exposure caused an estimated 3,759 premature deaths from 2016-2020.<sup>ii</sup>

As part of its National Energy and Climate Plan (NECP) and Energy Strategy, North Macedonia plans to expand its use of renewable energy sources and natural gas. Investment in gas infrastructure includes new interconnections with Greece, Kosovo, Serbia and Albania and expansion of the domestic transmission and distribution grid. Natural gas has important role to play in the energy transition as it supports substituting coal and more polluting fuels and diversification of supply by providing access to the Trans Adriatic Pipeline (“TAP”) and LNG terminals in Greece. North Macedonia currently relies on gas from Trans Balkan Pipeline (“TBP”).<sup>iii</sup> New interconnection with Serbia would also potentially enable supplying gas to this coal-dominated economy.

Figure 1 - Map of planned investments to expand the gas supply



### Paris Alignment (the Energy Sector Strategy (2024-2028)) Assessment Summary

**Mitigation:** The Project is assessed as Paris Aligned and consistent with the Energy Sector Strategy (2024-2028). The Project is aligned with the Macedonian enhanced NDC and a credible low carbon strategy that reduces emission substantially by 2030. Modelling by EBRD shows that the economy can also reach net zero emissions by 2050 with the proposed investments and that the resulting gas expansion will accelerate the pace of decarbonisation by enabling the substitution of coal, oil and solid fuels in households, commercial buildings, industry and the power sector. The Project shows material economic benefits relative to alternatives with expected net benefits of NPV EUR 27 billion. The risk of carbon lock-in is low and acceptable considering a set of mitigations.

**Adaptation:** The Project shows exposure to some physical climate risks with respect to flooding and extreme mass movement hazards (landslides). These risks have been identified and are being managed in the design of the pipeline.

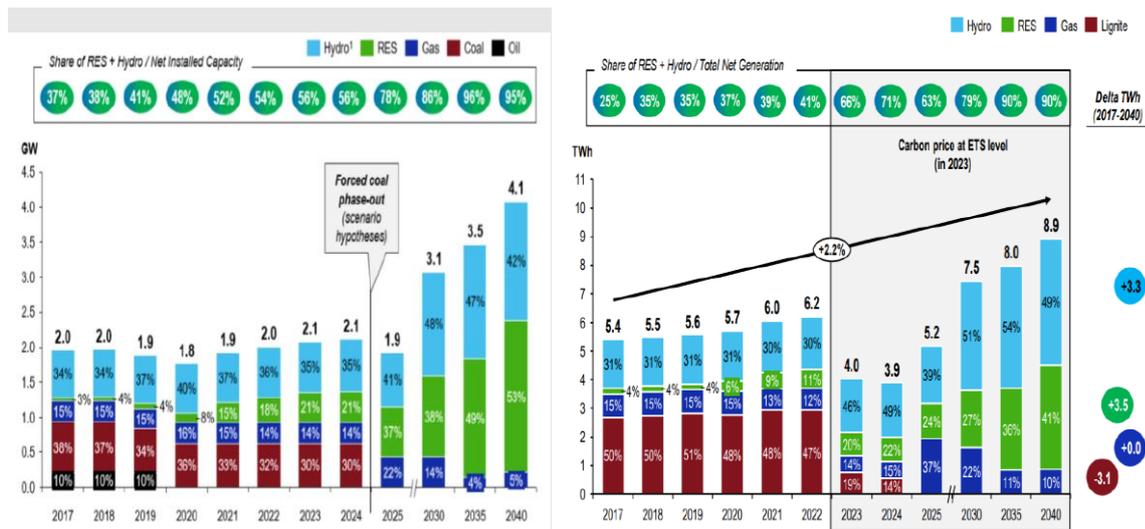
**Paris alignment and the Energy Sector Strategy (2024-2028): detailed assessment**

The EBRD Paris Alignment methodology and the Energy Sector Strategy (2024-2028) requires that a project meet the below criteria:

**i) Alignment with a credible low carbon strategy and acceleration of decarbonisation**

Gas expansion is an essential component of Macedonian energy and climate plans. This energy transmission infrastructure is explicitly included in the NECP<sup>iv</sup> 2022, enhanced NDC and the Energy Strategy (Green Scenario, 2019). These strategies rely on building new renewable energy sources (expected to be 1.7 GW by 2030 and 2.2 GW of wind and solar by 2040) and the supply of additional natural gas to support the rapid phase out coal and other more polluting fuels in industry, power and households (See Figure 2). Gas consumption growth is expected to be driven by industrial demand and electricity and heat production<sup>v</sup>.

Figure 2 – North Macedonia Energy Strategy, Power sector (Green Scenario). Installed Capacity in the power sector GW (left) and total Net Generation TWh (right).



In addition, EBRD commissioned independent specialist to model a Net Zero emissions transition by 2050. This builds on the existing NECP/Energy strategy (green scenario) and simulates a transition to Net Zero emissions by 2050 for key sectors: power generation, industry, commercial buildings and households. It also considers the implications of a conservative coal phase out date of 2030<sup>3</sup>. The outputs of this analysis (Figures 3-5 below) indicate that gasification investments:

- a) allow for the take up of gas across key sectors, and will mainly be utilised for industry and power generation, with some use in commercial and household end uses (Figure 3&4).
  - a) By 2030, 40% of gas used is expected to be for industrial consumption and 28% for power. The level of projected gas use is consistent with a net zero 2050 transition if gas use peaks in 2039 and starts to decline in the 2040's.
  - b) Gas contributes less than 5% of energy demand across households, commerce and industry at present. By 2039 gas is expected to contribute c 30% then to decline in the 2040's. Gas expands energy options but is not expected to dominate the energy mix.

- b) substitute solid fuels and coal, which are used in household, commercial and industrial sectors (Figure 4).
- c) substitute coal for power generation including the closure of the existing coal fired Thermal Power Plants (TPP) in Bitola and Oslomej (see Figure 5);
- d) reduce emissions quickly and achieve early peaking of emissions this decade. GHG emissions and air pollution decline significantly out to 2040 and can reach net zero by 2050 (see Figures 7&8)



Figure 3 – Expected gas use TWh across key end use sectors

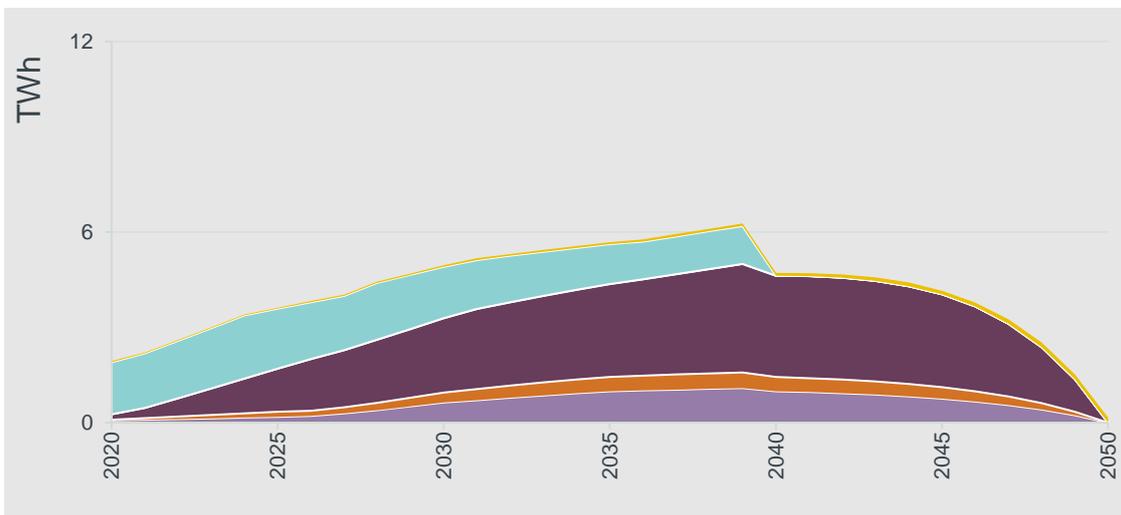
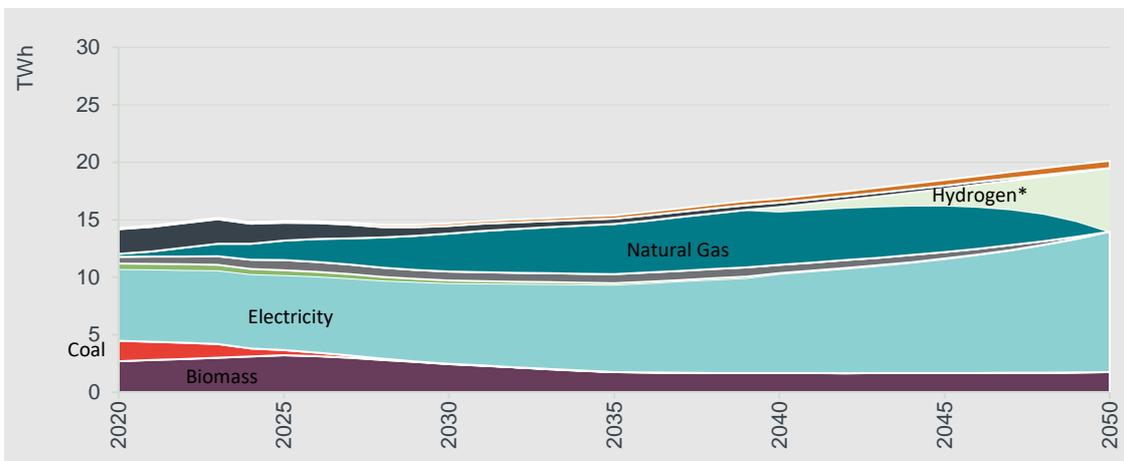
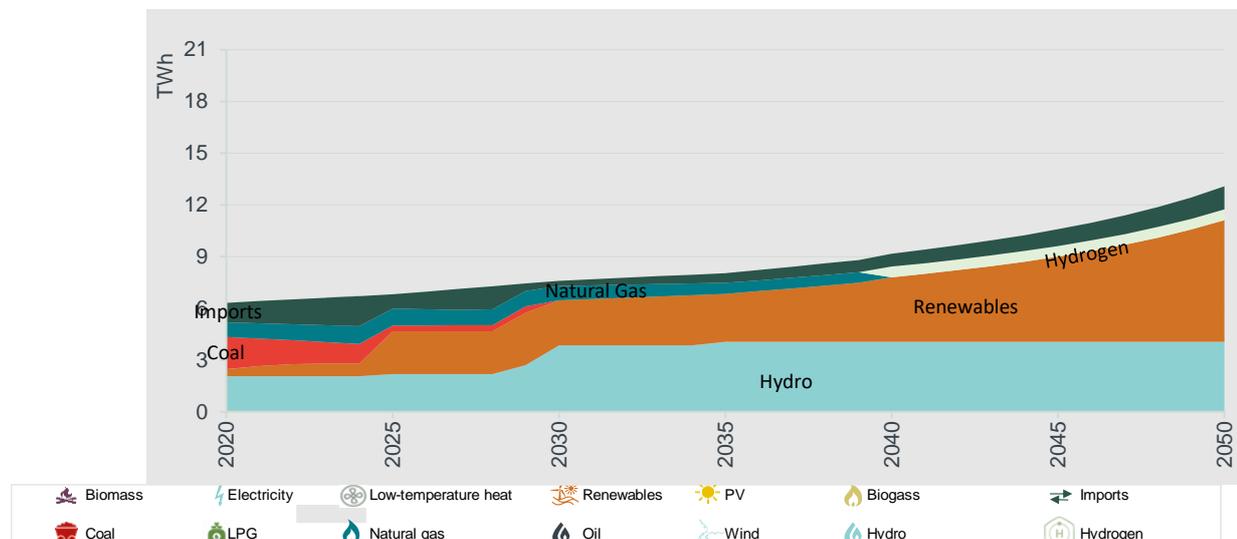


Figure 4 – Household, commerce and industrial energy demand in Gas expansion and net zero 2050 scenario



\* Green hydrogen use is expected only in the industrial sector in the 2040's and not in commercial or household sectors.

Figure 5 – Power generation (TWh) in Gas expansion and net zero 2050 scenario



## ii) Economic Viability

**Assessment approach:** This analysis covers a broad set of investments in gas interconnection, transmission and distribution. It appraises the downstream uses of gas in i) the electricity (power) system in North Macedonia ii) space (and water) heating at households and commercial facilities and iii) energy consumption for industrial processes using heat. The analysis estimates direct financial costs and externality costs including GHGs emissions (both direct and upstream) and local air pollution emissions. The analysis quantifies and compares the expected costs and benefits of 3 cases of possible gas expansion in North Macedonia:

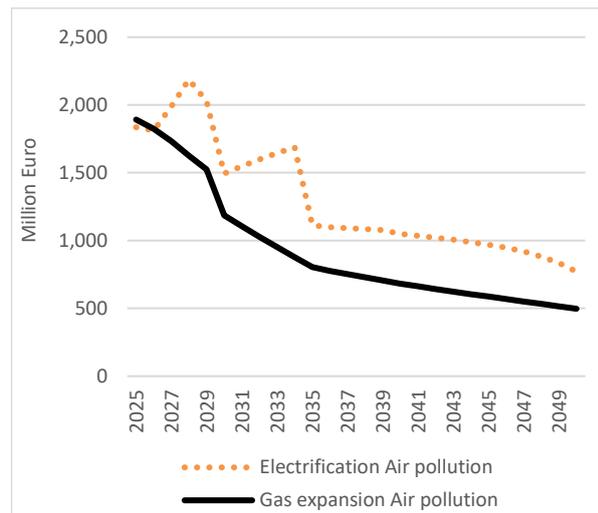
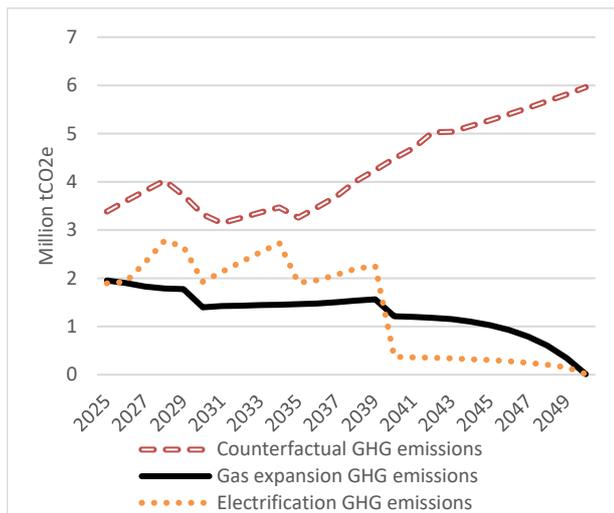
<p><b>Project Scenario:</b></p> <p>Gas expansion and net zero 2050</p>	<p>Economy wide transition to net zero emissions by 2050 <u>with the expansion of gas supply to key sectors</u> in line with the NECP. Gas interconnection, transmission and distribution investments enable the substitution of gas for coal and oil for power generation and heating purposes in the residential, commercial and industrial sectors. Natural gas also substitutes fuelwood in buildings. From 2040, a combination of direct electrification in commercial and residential sectors using heat-pumps, and a switch-over of gas to green hydrogen in industry ensures net-zero consistency.</p>
<p><b>Project alternative:</b></p> <p>Electrification only (with no new gas investment) and net zero 2050</p>	<p>Economy transition to net zero emissions by 2050 relying only electrification and upstream renewables and <u>without the expansion of the existing gas supply or additional natural gas investment</u>. Where possible, electricity substitutes carbon-intensive fuels in residential, commercial and industrial sectors. Renewable energy expansion largely supports the corresponding increase in the demand of electricity. CCS contributes to reach net-zero emissions in sectors where electrification is not possible by 2050.</p>
<p><b>Counterfactual</b></p>	<p>North Macedonia does not engage in the expansion of the existing gas supply nor in the electrification of heating or industrial processes and does not reduce emissions. This represents a business as usual scenario, and is based on the Energy Strategy/NECP Reference scenario.</p>

## Results:

The results show that gas expansion has significant net benefits of EUR 27 billion, relative to the counterfactual. This is driven by substantial savings in direct GHG emissions and direct air quality as gas substitutes coal, fuel oil and solid fuels. Gas expansion delivers significant economic net benefits and reductions in GHG emissions and air pollution (see Figures 7 and 8) relative to alternatives. Reductions in GHG emissions and air pollution crucially occur before 2040. Gas expansion also reduces emission of GHG and air pollution faster and more significantly than alternatives (i.e. electrification only options).

Figure 3 (left) - Comparison of GHG emissions (Scope 1,2 and 3 direct and Upstream) (MtCO<sub>2</sub>e)

Figure 4 (right) - Expected damage cost of total aggregate air pollution (Sulphur dioxide, SO<sub>2</sub>; Nitrogen Oxide, NO<sub>x</sub>; and Fine Particles – PM<sub>10</sub> and PM<sub>2.5</sub>)



Gas expansion has significantly higher net social benefits than the electrification scenario (which brings an NPV of EUR 18.4 billion). This is because an electrification only alternative entails higher GHG and higher levels of air pollution emissions in the early years as it takes longer to take coal out of the energy mix and has higher switching costs. Also, several energy-intensive industries have no technical solutions available at full commercial scale to substitute with electricity so would have to rely on alternatives such as CCS to decarbonise.

Figure 5 - NPV breakdown of project cases Million Euro<sub>2023</sub>, relative to counterfactual.

	Project case: gas expansion	Alternative 1: Electrification
<b>Net Present Value</b>	<b>26,967</b>	<b>18,409</b>
GHG savings – direct	7,988	7,444
GHG savings – upstream	1,044	689
Air quality emissions savings – direct	20,438	14,919
Air quality emissions savings – upstream	1,201	153
Savings costs of energy procurement	42	581
Gas interconnection and networks	-1,001	0
Power capacity and networks	1,002	-580
Energy efficiency investments	-3,131	-3,131
Switching costs	-50	-1,085
Net-zero investments (end-use sectors)	-567	-582

**Key assumptions:** A list of key assumptions can be found at the end of this annex. Natural gas and commodity price assumptions are based on April 2023 estimates and includes the latest available information reflecting energy market distortions in 2021/2022. The analysis adopts a 6% discount rate out to 2050<sup>vi</sup>.

**Sensitivities:** Sensitivity analysis shows the gas expansion scenario's performance against alternatives is robust to changes in all key variables. This analysis is based on April 2023 gas market outlook: three gas price scenarios (high, low and central) have been used. The Project demonstrates considerable net benefits over other options across all gas price scenarios. The results are sensitive only to extreme and sustained swings in natural gas prices (>500% of assessed gas prices).

### iii) Carbon lock-in

Carbon lock-in occurs when technical, economic or institutional factors mean that an asset will continue to operate in the future in an emissions-intensive way, even when there are feasible, and economically preferable, lower carbon options that could replace it.

Carbon lock-in risks for the Project are considered as follows:

*Low Carbon Readiness:* The gas infrastructure is designed and constructed to be able to transport up to 100% low carbon hydrogen. However, there is uncertainty with regards to the availability and cost of low carbon hydrogen in this region and therefore its viable uses. Analysis by the EBRD suggests that the Western Balkans are unlikely to become a major cost competitive producer of low carbon hydrogen and demand will primarily rely on imports<sup>vii</sup>. Outside of global developments, there are currently no well-developed and published hydrogen plans or investment commitments. The updated NECP (expected 2024) is likely to include the role of low carbon hydrogen.

*Cost Structure:* Levelized Cost of Electricity (LCOE) is low (and falling) for renewables, incentivising low carbon electricity generation from renewables over other sources. The Short Run Marginal Cost of switching to gas for heating in household and industry are however lower than the full cost of switching to electrification i.e. gas represent a cheaper option today for many end uses (especially low income households which currently mainly use oil products, coal and fuelwood/solid fuels for heating) and electrification options remain comparatively expensive. Over time the costs of electrification alternatives are expected to come down but this may require public policy to reduce the costs of gas alternatives, for example through targeted subsidies.

*Market structure and Commercial arrangements:* The assets will face regulation and will be exposed to the competitive pressure of other energy sources for energy in key end use sectors. The economic payback period of the gas interconnection is seven years. Consistent with the modelled need for gas in a Net Zero 2050 scenario, allocated Capacity (October 2022) at the Greek Side of the Interconnection Point "Evzoni – Gevgelija" in the direction from Greece to North Macedonia: 2024/25 capacity is 4.6 GWh, rising to 24.8 GWh in 2031/32 and declining to 12.4 GWh in 2043/44 and to zero thereafter<sup>viii</sup>. The tariff is based on volume with some capacity related payments (c. 10%), meaning that demand for gas in end use sectors is the key determinant of the use of the infrastructure.

#### Mitigations:

- The Project is consistent with, and is considered an essential part of, the Energy Strategy (Green Scenario) and the enhanced NDC (2021) and NECP 2022. An updated NECP will be developed in 2024 and is expected to include a key role for gas into the 2040's as the economy decarbonises.
- Energy Community Secretariat Ministerial agreement: Key Performance Indicators on renewables deployment and emissions are reflected in Energy Community ministerial agreement<sup>ix</sup>. This sets a 38% share of renewable energy in Gross final consumption by 2030 and net GHG reduction of 82% by 2030, consistent with the NECP 2022 and the completion of this gas interconnection.

- EU accession: With EU accession, North Macedonia would adopt the EU-ETS and other EU climate commitments (e.g. EU fit for 55, RePowerEU and Net Zero 2050). This would create additional policy incentives and increase the relative costs of emission intensive assets (in power and industrial sectors).
- EU Carbon Border Adjustment Mechanism (CBAM): will affect trade with the EU in Aluminium, Iron and Steel and Cement which reached nearly 780 M EUR in 2021.<sup>x</sup> This provides trade related incentives to decarbonise through imposing carbon costs on EU imports. CBAM enters its transitional phase and into force in 2026.
- CIF ACT program, approved in March 2024. This provides concessional funding from the Climate Investment Fund to support accelerated and just energy transition. It aims to mobilise further support for the country's energy transition, targeting network and RES investments. The investment programme will unlock up to USD 85 million of grants and concessional finance for both private-and public-sector projects in coal-reliant regions (Southwest & Pelagonia). MDBs will then match additional private sector funds primarily through loans, reaching the total financing of circa USD 350-600 million.
- Modelling of a net zero 2050 economy shows that planned gas expansion is consistent with Net Zero GHG emissions by 2050 and delivers substantial economic benefits compared to other options.
  - o In the power sector, gas investments support coal phase out and are unlikely to displace, hinder or to prevent or delay the introduction of renewable energy generation.
  - o In the industrial sector, gas can displace coal earlier than electrification, there are also no alternative routes to switch some heavy industry away from coal in the short/medium term. Longer term there are options for industry to electrify, utilise low carbon gases or deploy CCUS.
  - o In the household and commercial buildings sector, gas displaces more polluting solid fuels in the short to medium term. In the longer term the sector is unlikely to utilise clean hydrogen and should deploy electrification options to meet net zero. Any future use of gas should be compatible with the national long-term plan to decarbonise the building stock in North Macedonia.

### **Conclusion:**

Judging the overall risk of carbon lock in gas infrastructure investments is complex and open to a degree of uncertainty over a long-term horizon. The assessment of risk must balance a range of anticipated short-term benefits of gas expansion - reducing air pollution and enabling coal phase out - with a set of mitigations and longer-term uncertainty around the role of gas and associated infrastructure in a Net Zero economy.

On one hand, decarbonisation to Net Zero by 2050 implies a declining role for fossil fuels as the economy increasingly relies on low carbon solutions. Even so, gas use in particular is expected to play a vital role in the next 30 years to transition away from coal and provide more flexible options to industry and the power sector. Yet, to reach Net Zero by 2050, end use sector that utilise the gas must eventually move toward electrification or switch to low carbon gases where viable or adopting CCUS. Many of these technologies and fuels (e.g. expansive roll out of heat pumps, electrification of industrial processes and switching to low carbon gases) are not commercially and financially viable at present and technology and costs dynamics in the 2030's and 2040's that are inherently uncertain and difficult to accurately and reliably predict today.

Conversely, the Project is unlikely to prevent or delay the introduction of renewable energy or low carbon solutions, and without gas expansion the energy mix and air pollution levels in North Macedonia are unlikely to change in the short term: coal will likely remain a key source of energy in the power and industrial sectors. Gas investments allow to directly substitute coal, oil and solid fuels in households, commercial buildings, industry and the power sector and these key end use sectors can accelerate the pace of decarbonisation in the next decade. Gas expansion investment also add to the range of energy options available and offers more flexibility for households, industry and the power sector and diversifies the energy mix in terms of available energy sources. Gas expansion shows material net economic benefits over alternatives and more significant reductions in GHG and air pollution emissions before 2040. This gas infrastructure can also be repurposed for low carbon gases should it be viable.

The overall level of carbon lock in risk, considering mitigations set out above, is low and acceptable.

**iv) Alignment with the adaptation goals of Paris Agreement**

*Evaluation of the physical climate risk and vulnerability context:*

Greece-North Macedonia Interconnector: this segment of the proposed pipeline has been identified as being potentially exposed to the risk of (riverine) flooding and extreme mass movements.

Sveti Nikole-Veles: this segment of the proposed pipeline has been identified as being potentially exposed to the risk of extreme mass movements.

*Definition of climate resilience measures:*

Flood risk: the routing for both segments largely takes the pipeline through areas not exposed to flood risk. For those areas where an element of flood exposure exists, the following adaptation measures have been put in place: for river crossings, the design of the interconnector pipeline foresees “Horizontal Directional Drilling” (HDD) - a trenchless method to install pipelines along a horizontal borehole which takes the pipeline far beneath the flood exposed areas. In parts with flood exposure, the pipeline is anchored to prevent “floating”. Extreme Mass Movements risk: additional exposure data<sup>xi</sup> researched could not confirm that the pipeline is significantly exposed to landslide risk along its routing for both segments. Furthermore, the pipeline - across its full extension (except the block stations) - is an underground facility dug into a depth of approximately 2.0m. This reduces its sensitivity to landslides.

*Appraisal of broader climate resilience context:*

The proposed transaction does not undermine the climate resilience of the wider system in which it operates, and it does not contravene relevant national legislation or plans on climate adaptation. In the event of the pipeline crossing through riverbeds – which in theory could constitute an alteration to the riverbed morphology or a possible deviation of the river-course at the detriment of the climate resilience of the wider system – Horizontal Directional Drilling (HDD) was chosen as a method to channel the pipeline beneath the riverbed to avoid interference with riverbed morphology.

**v) Climate related Financial Risk**

<b>Climate-related financial risk</b>	
Final physical climate risk score for the key counterparty of risk	2
Evaluation of the physical climate risk for the key counterparty of risk	N/A
Final carbon transition risk score for the key counterparty of risk	2
Evaluation of carbon transition risks for the key counterparty of risk	The borrower is a state owned enterprise for gas transmission.

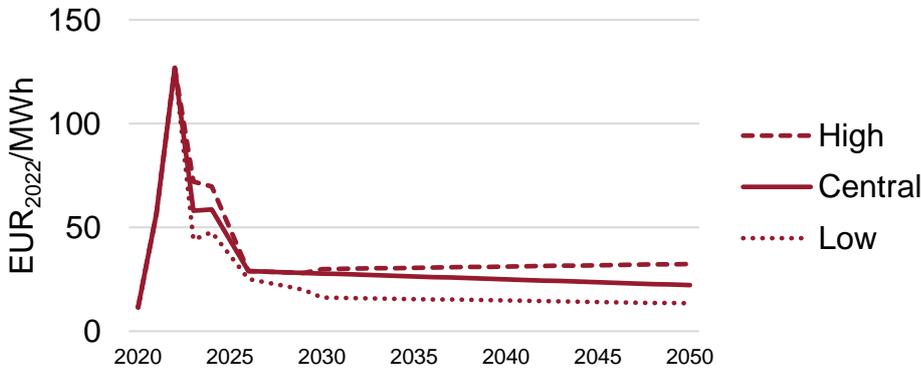
**vi) Best available techniques and meets the highest environmental and social standards.**

The Project will be designed and operated to fully meet the EU Methane Strategy in terms of monitoring, reporting and abatement of methane emissions. North Macedonia has joined the Global Methane Pledge.

**GET attribution** N/A

**Key modelling assumptions for Economic Assessment**

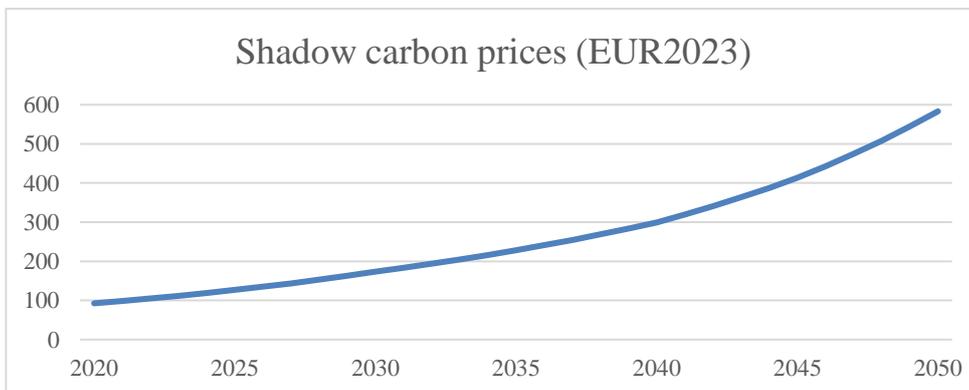
Natural Gas: Analysis on natural gas price outlooks was carried out in April 2023. We use a central, high and low gas price scenario based on: 1) University of Cologne Energy Institute 2022<sup>xii</sup> and 2) IEA World Energy Outlook (October 2022)<sup>xiii</sup> and 3) TTF/ICE futures prices (as of April 2023)<sup>xiv</sup>. The Project has highest net benefits of all scenarios considered under all natural gas prices scenarios analysed. Figure 6 – Natural gas price scenario’s April 2023. EUR<sub>2022</sub>/MWh



Upstream [REDACTED] natural gas<sup>xv</sup>:

Route	Share of the route	Origin	Share of the origin in the route		
			2021	2030	2040
Greece	50%	Russia (Tursktream)	40%	5%	5%
Greece	50%	Azerbaijan (TAP)	19%	30%	30%
Greece	50%	LNG (global)	41%	65%	65%
Bulgaria	50%	Bulgaria	4%	9%	6%
Bulgaria	50%	Russia (Transbalkan)	96%	5%	5%
Bulgaria	50%	LNG (Global)	0%	44%	39%
Bulgaria	50%	Romania	0%	10%	10%
Bulgaria	50%	Azerbaijan (TAP)	0%	32%	32%

Shadow carbon prices<sup>xvi</sup>:



Air pollutant damage costs: Estimates are derived from the European Environment Agency, central estimates (the average of low and high) are used with sensitivity for high and low values.

	Low	High	Unit
Shadow price for sulphur dioxide (SO <sub>2</sub> )	11,862	29,403	EUR <sub>2023</sub> /tonne
Shadow price for nitrogen oxide (NO <sub>x</sub> )	11,430	12,039	EUR <sub>2023</sub> /tonne
Shadow price for fine particulates - Soot (PM <sub>2.5</sub> )	40,998	119,845	EUR <sub>2023</sub> /tonne
Shadow price for large particulates (PM <sub>10</sub> )	25,696	77,822	EUR <sub>2023</sub> /tonne

Power sector: Existing generation assets (top) and [REDACTED] candidate options (bottom) used in NECP modelling<sup>xvii</sup>.

#	Power plant / Unit	Technology / Fuel	Commissioning (year)	Net installed capacity (MW)	Efficiency (%)	Availability (%)	Retirement (year)	Fixed O&M (k€/MW)	Variable O&M (€/MWh)
1	Bitola – Unit 1	Lignite	1982	212					
2	Bitola – Unit 2	Lignite	1984	212	30%	76%	2025 (LCP dir. requirement)	33.03	3.7
3	Bitola – Unit 3	Lignite	1988	212					
4	Oslomej	Lignite	1979	100	30%	60%	2019		
5	Negotino	Heavy oil	1978	198	34%	65%	2020	9.71	3.7
6	Vrben	Large HPP	1959 / 2004	12.8	-	40%	After 2050		
7	Vrutok	Large HPP	1957 / 1972 / 2014	164	-	26%	After 2050		
8	Raven	Large HPP	1957 / 1974 / 2014	21	-	28%	After 2050		
9	Tikves	Large HPP	1966 / 1981	112	-	18%	After 2050		
10	Kalimanci	Large HPP	2006	13.8	-	14%	After 2050		
11	Globocica	Large HPP	1965	42	-	58%	After 2050	18.5*	2.2
12	Spilje	Large HPP	1969	84	-	41%	After 2050		
13	Kozjak	Large HPP	2004	80	-	21%	After 2050		
14	Matka	Large HPP	2009	9.6	-	48%	After 2050		
15	Sv. Petka	Large HPP	2013	36.4	-	21%	After 2050		
16	Small hydro <sup>1</sup>	Small HPP	-	27.2	-	27%	After 2050		
17	TE-TO	Gas CHP	2012	230	52%	90%			
18	Kogel	Gas CHP	2008	30	44%	85%	After 2040	64.6	1.4
19	Energetika	Gas CHP	2008	30	44%	85%			

#	Power plant option	Technology / Fuel	Start year (potential)	Useful life (years)	Installed capacity (MW)	Efficiency (%)	Availability (%)	CAPEX (k€/MW)	Fixed O&M (k€/MW)	Variable O&M (€/MWh)	
1	Bitola (revitalization)	Lignite	2025	15	650	32%	74%	295	33.3	3.7	
2	Oslomej (revitalization)	Lignite	2023	20	109	32%	70%	1,211	25.3	3.7	
3	New lignite PP	Lignite	2022-2033	35	300	40%	80%	2,623	25.3	4.6	
4	New CHP	Gas CHP	2025	30	450	52%	80%	436			
5	Exist. CHP (revitalization)	Gas CHP	2021	15	260	52%	80%	436			
6	New Gas CHP	Gas CHP	2023	30	40	45%	85%	790	8.1	1.4	
7	New Gas CHP	Gas CHP	2023	30	30	45%	85%	790			
8	New Gas CHP	Gas CHP	2023	30	30	45%	85%	790			
9	New Gas PP	Gas	2033	30	230	58%	90%	1090			
10	Tenovo-Kozjak project	Large hydro	2030	50	Project increasing supply of existing Kozjak, Matka & Sv. Petka HPP						
11	Globocica II	Large hydro	2035	50	20	-	16%	1,670			
12	Veles	Large hydro	2030	50	96	-	38.1%	1,151			
14	Cabren	Large hydro	2029	50	458	-	26%	1,207			
15	Gradec	Large hydro	2030	50	75.34	-	51%	3,477			
16	Galiste	Large hydro	2035	50	77.9	-	24.3%	3,786	3	2.1	
17	Vardar Valley SHPPs 1	Small hydro	2025	50	45	-	29.6%	1,927			
18	Vardar Valley SHPPs 2	Small hydro	2030	50	152.51	-	37.3%	2,085			
19	Small hydro	Small hydro	2019	30	Max 135-160 <sup>2</sup>	-	29%	2,240			
20	Biogas with FIT	Biogas	2020	25	18	-	80%	4,000	130-125 <sup>3</sup>	-	
21	Biogas without FIT	Biogas	2025	25	10	-	80%	4,000			
22	PP or CHP on biomass	Biomass	2020	25	12.5-15	31%	73.8%	1,750	71.8	6.48	
23	Wind with FIT	Wind	2021	20	64	-	32%	1,500	25.6	-	
24	Wind with FIP	Wind	2022	20	50	-	32%	1,500	25.7	-	
25	Wind without FIP or FIT	Wind	2025	20	100-500 <sup>1</sup>	-	32%	1.3-1.2k	25.6	-	
26	Oslomej PV	PV	2019	40	10	-	16%	862	31.3	-	
27	PV with FIP	PV	2020	40	200	-	16%	800-600	31.4	-	
28	PV without FIP	PV	2020	40	400-800 <sup>1</sup>	-	16%	800-600	31.4	-	
29	PV rooftop	PV	2019	40	250-400 <sup>1</sup>	-	16%	1,000-700	31.4	-	

## ANNEX 4 – PROJECT IMPLEMENTATION

### Procurement classification – *Public Sovereign*

#### Project risk assessment:

[REDACTED]

#### Country Risk Assessment - Moderate

In accordance with the current EBRD Country Procurement Risk Index 2017<sup>4</sup>, North Macedonia is allocated “high” level of risk to be applied to all public sector projects. The index is based on the level of compliance with the EBRD Core Public Procurement Principles as assessed in the EBRD Public Procurement Assessment 2011 and adjusted to take into account the scores from the Transparency International Corruption Perceptions Index 2017. In the particular case for Bosnia and Herzegovina, the Country risk assessment is also based on Transparency International Score.

#### The Borrower’s capacity assessment related risk – Moderate

NOMAGAS is first time Borrower to EBRD. [REDACTED]. It is expected that the PIU will be composed by members the Company. The PIU will have overall responsibility for the implementation of the Project and it will require direct support to ensure adherence to Bank’s Policies as well as training on the application of best practises in relation to public procurement, project management and project implementation. Therefore, the PIU will be initially supported by a Procurement Support Consultant from project preparation until selection of the PIU consultant. The PIU consultant will assist the PIU along the entire project cycle in all aspects of procurement and the implementation of the Project in accordance with the Bank’s policies. The PIU consultant will ensure that the company meets the requirements of various financing documents as well control and monitor of envisaged activities and provide PIU support to the PIU while training and developing its members with on-the-job training. Moreover, it is expected that a supervision consultant will act on behalf of the Company as main Supervision Engineer during the implementation of the works contracts.

The Bank will provide training on EBRD Procurement Policies and Rules for the public sector operations (PP&R) as well as support along the procurement and implementation of this Project.

#### Contracts risk assessment – Moderate

The scope of the Project envisages the construction of hydrogen ready (i) natural gas interconnection pipeline with Greece (66km; interconnection) and (ii) two natural gas transmission pipelines, Gostivar to Kicevo (34km; Section 1) and Sveti Nikole to Veles (28km; Section 2) in North Macedonia.

The envisaged contracts involve certain technical complexity and it is the first of its size for the Company. [REDACTED]. The situation is well known to the Borrower, and they will

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<sup>4</sup> EBRD Country Procurement Risk Index 2017, Edition V.5 January 2017.

respond appropriately to mitigate the risk. In addition, the lack of Borrower's capacity to conduct the required activities during project implementation would be mitigate with the mobilization of PIU and Implementation Consultant. [REDACTED].

**Project implementation arrangements:**

Three works contract will be financed by the proceeds of the Bank's loan. The Interconnection Pipeline with Greece (about 66 km) is planned to be procured following EIB Guide to Procurement. The contract will be co-finance by EIB, WBIF and EBRD. A Project Implementation Agreement has been revised and is expected to be signed between EIB and EBRD shortly.

The other two contracts (Section 1: Construction of Gas transmission pipeline between Gostivar and Kicevo (about 34 km) and Section 2: Construction of Gas transmission line between Sveti Nikole and Veles (about 28 km)) will be procured following the latest version of the Bank's PP&R and will be subject to prior review by the Bank.

Given the nature and volume of the envisaged works, the works contracts will be implemented following FIDIC Green Red book and there are expected to be procured using single open tendering method using the Bank's latest standard procurement documents. The preliminary designs are prepared by the Company and it is expected that the PIU consultant will review them available documentation and specifications to ensure that there are fit for purpose and in line with Bank's policies and best practices.

In terms of Technical Cooperation, there are planned three consultant contract (i) Procurement Support for selection of the PIU consultant, (ii) PIU Consultant - procurement support for section 1&2 (iii) Supervision Engineer for Sections 1 and 2 (iv) E&S control and monitoring during construction and operation of interconnector, sections 1 and 2 and (v) E&S consultant for Section 1.

The contracts will be procured following the latest version of the Bank's PP&R and will be subject to prior review by the Bank.

It is envisaged that the three consultancy contracts will be financed by the loan. The Supervision and PIU consultancy will be procured following two stage open competitive selection while the Procurement Support and E&S Consultants would be procured following Direct Contracting in accordance with the Bank's PP&R (2022) [REDACTED].

