

DE-RISKING INVESTMENTS IN NORTH MACEDONIA

Renewable energy finance and
policy landscape focusing on power,
heating and cooling.

In line with the Macedonian Nationally
Determined Contributions on Climate Change



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About IRENA

The International Renewable Energy Agency (IRENA) serves as the principal platform for international co-operation, a centre of excellence, and a repository of policy, technology, resource and financial knowledge, and a driver of action the ground to advance the transformation of the global energy system. An international organisation established in 2011, IRENA promotes the widespread adoption and sustainable use of all forms of renewable energy, including bioenergy, geothermal, hydropower, ocean, solar and wind energy, in the pursuit of sustainable development, energy access, energy security and low-carbon economic growth and prosperity.

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UNDP works in about 170 countries and territories, helping to eradicate poverty, reduce inequalities and exclusion, and build resilience so countries can sustain progress. As the UN's development agency, UNDP through its Climate Promise offer plays a critical role in helping 119 countries to make bold pledges under the Paris Agreement to reduce emissions of the greenhouse gases (GHG) that cause global warming. Our Promise support draws upon UNDP's extensive portfolio of expertise across priorities such as energy, forests, water, resilience, agriculture, health, youth, finance, governance, gender equality and green jobs. The Climate Promise is our commitment to ensure that any country, including the Republic of North Macedonia, wishing to increase the ambition of their national climate pledge is able to do so.

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Executive Summary

The energy sector of the Republic of North Macedonia (hereafter North Macedonia) is predominantly based on fossil fuels. Against this background, North Macedonia has been on a commendable path to reinforce renewable energy in its overall energy mix, and the country has recently adopted or is in the process of drafting key strategies to support sustainable economic growth with a focus on energy and climate change and in alignment with the European Union (EU) legislation.

IRENA's analysis identified specific barriers and associated risks holding back private-sector investment in renewable energy in North Macedonia. The opportunity lies with the speedy implementation of specific actions to address project start-up barriers, as well as development and investment risks. In parallel,

preparations need to commence for medium- to long-term actions that will target scaling up investments as the renewable energy market in North Macedonia matures.

The analysis suggests that combined action by the government of North Macedonia and development finance institutions (DFIs) would contribute to reducing risks related to renewable energy investment. This collaboration would be conducive to attracting first institutional investors in the medium to long term, followed by other private finance players to the market. The expectation is that investors with a larger risk appetite enter the renewable energy market first. This report presents recommendations specifically for the government of North Macedonia and DFIs and other relevant public institutions.

IMMEDIATE (SHORT-TERM) FOCUS

Recommendations for the government of North Macedonia

The government plays a critical role in creating an enabling environment for investments in renewable energy. This can be done through dedicated policies and regulations in all end uses, and financing mechanisms such as government guarantees for projects, the creation of a renewable energy fund, together with lending options to disburse the renewable fund resources through the following recommended actions:

Create an enabling environment for investments in the power sector, including:

- **Introduce capacity or budget caps** on renewables capacity that can benefit from the feed-in tariff (FIT) and feed-in premium (FIP) support mechanisms per technology, and review and plan for the medium- to long-term evolution of caps for specific renewable energy technologies.
- **Support renewable electricity self-consumption.** Update the existing rulebook based on lessons learned and feedback from the stakeholders using the guidelines from the Energy Community and develop a country-wide register of renewable power installations for self-consumption.
- **Explore the opportunity to introduce demand response programmes** to complement on-site power generation by consumers.
- **Finalise a standardised European Energy Certificate System** for guarantees of origin of electricity to enable participation of foreign market players and investors.
- **Pursue the planned changes in the power system** such as the implementation of balancing rules, storage and other demand response options, and market interconnection with surrounding countries.

Create an enabling environment for investments in heating and cooling, including:

- **Develop regulations for efficient appliances** and develop a system to enforce compliance.
- **Consider introducing legal requirements for the replacement of fossil fuel-based and non-efficient equipment.** This could require providing financing support.

- **Adopt financing mechanisms** for the installation of renewable heating and cooling solutions in buildings and industry to reduce the upfront cost of investment.
- **Raise awareness** about the potential and benefits of renewable heating and cooling among customers and stakeholders.
- **Pursue the development of district heating systems** prioritising renewable options in selected cities.

Consider cross-cutting policies to create an enabling environment for the energy transition.

Continue developing a regulatory framework and fiscal system that facilitates the adoption of energy transition solutions while discouraging investments in fossil fuel technologies and supporting a phase-out aligned with climate goals.

Provide government guarantees for renewable energy projects. Leverage capital market solutions for enhancing access to capital for renewable energy projects while building bankable project pipelines and local capabilities. The creation of a dedicated renewable energy fund can help achieve these objectives.

Create a dedicated renewable energy fund. North Macedonia could leverage capital market solutions for enhancing access to capital for renewable energy projects while building bankable project pipelines and local capabilities. The creation of a dedicated renewable energy fund can help achieve these objectives. The following are some of the considerations for a design of a local renewable energy fund:

- **Offer a platform for engaging DFIs and institutional investors.**
- **Support project preparation and facilitation** by offering technical assistance and grants either directly at the project level or at the sector level (e.g. analysis of the potential for renewables in heating and cooling).
- **Streamline institutional procedures** for accessing financial instruments and risk mitigation mechanisms.

- **Facilitate access to capital** by creating a domestic infrastructure for renewable energy lending with the involvement of local banks using debt and hybrid instruments to improve local lending capacity, access to capital and risk-adjusted returns for renewable energy investment.
- **Initiate finance policies** adapted to the needs of the market such as guidelines and regulations for capital markets to increase deal flow liquidity and funding supply.
- **Build capacity for stakeholders in the renewable and financial sectors** through education and training on financing renewable energy projects and on topics related to the deployment of renewables.

Consider lending options to disburse the renewable fund resources.

North Macedonia should explore different avenues to disburse finance from the future renewable energy fund. These should leverage the contribution by DFIs and contribute to de-risking of the project pipeline. The available options should include the creation of on-lending facilities, loan syndication, subordinated debt and convertible grants and loans.

In pursuing the above actions, the government of North Macedonia could leverage the contribution of DFIs and interested institutional investors.

Recommendations for DFIs and institutional investors

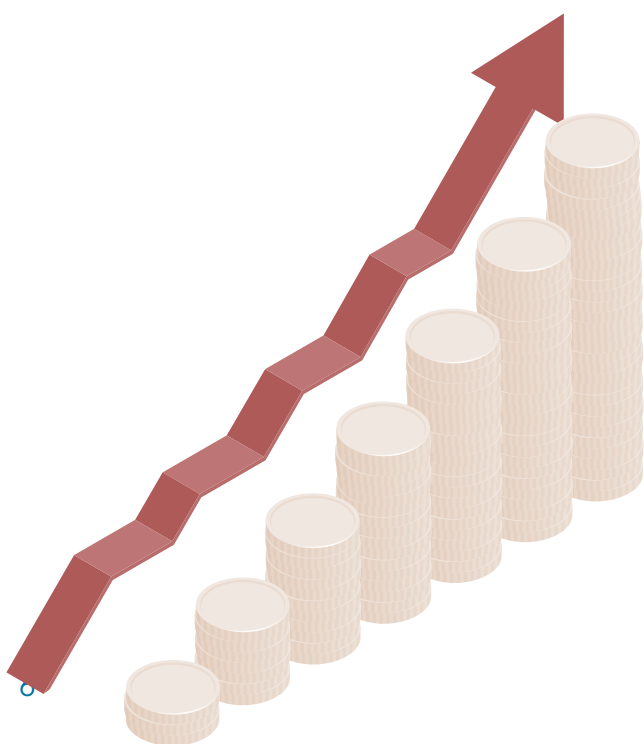
DFIs have been central to the development of the renewable energy market in Southeast Europe, including North Macedonia. With public finance dominating the renewables market, DFIs can influence market development and its scaling. Additionally, institutional investors are more likely to participate on the back of DFIs' market engagement. This analysis has identified several possibilities for the participation of DFIs, institutional investors and other relevant international organisations, including:

Support capacity building in the renewable sector, including finance.

DFIs can support capacity building in the financial sector and across the renewable energy value chain. For the financial sector and local financial institutions, specialised training for staff can help develop local expertise in renewable energy finance. Through their technical assistance and grants DFIs can offer support to project preparation and facilitation so that projects advance from initiation to full investment maturity.

Support design and planning for on-lending facilities under a renewable energy fund.

DFIs will need to support the development of on-lending facilities based on the financing needs of renewable energy investments. Planning and designing suitable on-lending facilities require a good understanding of the local financing capacity, the appropriate enabling policies in place and other planned government actions. On-lending facilities should offer different loan sizes and tenors, suitable for different renewable energy technologies and scales that align with the country's renewable energy strategy.



Support the design and implementation of risk mitigation instruments.

Risk mitigation instruments such as government guarantees will be important to reduce investor risk. Other risk mitigation tools should include the creation of liquidity facilities to provide short-term cash flow to a project or company or to extend the time to improve a project's liquidity profile.

Communicate and raise awareness about opportunities of renewable energy finance.

DFIs can increase the awareness about the available resources and ease the access capital among market participants. This can be conducted directly through their own channels and in collaboration with the government and its ongoing and planned initiatives. Direct marketing materials should be channelled under the framework of a renewable energy fund.

MEDIUM- TO LONG-TERM FOCUS

In the medium term, the focus should shift from building initial access to capital to scaling renewable energy projects. In order to achieve larger-scale investments, barriers to be addressed include high transaction costs, investment size and overall market liquidity, which can be tackled with structured finance mechanisms and capital market tools. The recommended actions pertain to four areas, including standardised contracts, aggregation, green bonds issuance and improved financial sector regulations.

Standardised contracts: Standardised project documentation entails standardised tendering, contracting and due diligence processes. The North Macedonian government can play a leading role in standardising the renewable energy power contracting process and even develop a country-wide template for a specific renewable energy technology. Alternatively, DFIs can play a role.

Aggregation: Aggregating several smaller renewable energy assets can address this challenge and reduce costs per project and widen the pool of finance providers. Building an aggregation model requires commitment from the government and specific terms of standardisation to be implemented by industry stakeholders.

Green bond issuance is an interesting option for refinancing existing renewable energy asset operations and asset pools, and are effective in attracting institutional investors. Government may decide to issue policy guidelines for bond issuance with standards for review, reporting and tracking. DFIs can structure project bonds with credit enhancements and improve the credit profile of renewable energy projects.

Financial sector regulations: Changes in the banking sector in North Macedonia are needed in order to extend long-term loans against unsecured project companies with offtake and fuel agreements, which are used for renewable energy projects. In preparation for accession talks with the European Union, North Macedonia can benefit from harmonising its legislation with the EU legislation.

North Macedonia has built momentum for the development of its renewable energy market. The situation is ripe for the implementation of mechanisms that will increase investment inflow into the country's ambitious renewable energy projects pipeline. The proposed recommendations require both short- and long-term action and close collaboration between the government and the DFI community, with the support of other international institutions, in particular IRENA.



1. Introduction

The energy sector of the Republic of North Macedonia (hereafter North Macedonia) is predominantly based on fossil fuels. Coal (mostly lignite) is the main domestic source (33.5 petajoules [PJ] produced in 2018), with an estimated reserve of 332 million tonnes (Mt) in 2017. It is followed by hydropower (7.5 PJ) and biomass (6.5 PJ) (IEA, 2020). In 2018, fossil fuels accounted for over 60% of North Macedonia's gross final energy consumption.

In terms of power generation, the majority of the total installed capacity – 2.06 gigawatts (63%) – comes from thermal power plants, while large and small hydropower plants represent 34% and other renewables 3%. The share of renewable energy sources (RES) in electricity production reached almost 25% in 2018, increasing steadily from 16% in 2010, primarily due to investments in technologies benefiting from preferential tariffs, as well as reduced electricity consumption.

As for heating and cooling uses, the share of RES in North Macedonia exceeded 31% in 2018 mainly from traditional biomass (firewood) for heating (North Macedonia, 2019), but with low efficiency, as the majority of stoves and biomass-based boilers do not use modern technologies.¹ This share increased by almost 5% compared with 2010 – an increase attributed primarily to the reassessed consumption of

traditional biomass. The use of open-fire stoves and firewood is a marker of energy poverty in Southeast Europe, where more than 30% of the population lacked access to clean cooking solutions in 2016 (IRENA, 2019). Finally, by 2018, the share of district heating in total heat supply was 10% and entirely based on gas, 56% of that in co-generation units. District heating operates only in the capital city of Skopje, which is home to more than 25% of the country's population.

Against this background, North Macedonia has been on a commendable path to reinforcing renewable energy in its overall energy mix, and the country has recently adopted or is in the process of drafting key strategies to support sustainable economic growth with a focus on energy and climate change and in alignment with European Union (EU) legislation.

Consistent with the Nationally Determined Contribution (NDC) submitted to the United Nations Framework Convention on Climate Change (UNFCCC) (MOEPP, 2021a), the country adopted the National Strategy for Energy Development (NSED) up to 2040 in December 2019 highlighting three possible scenarios for reducing carbon emissions. North Macedonia's enhanced NDC was approved and submitted to the UNFCCC Secretariat in April 2021. Additionally, the government submitted a draft

¹ *A transition to a more sustainable use of biomass can provide heating solutions that meet environmental standards and do not cause indoor pollution or pose the health threats associated with the traditional uses of biomass.*

National Energy and Climate Plan (NECP) to the Energy Community Secretariat (MOE, 2020), which has provided a set of recommendations to be considered in the final draft and targets that are expected to be approved in the 2021 NECP of the Republic of North Macedonia.

These national strategies and plans placed energy-related policies and actions at the centre of the efforts, especially by committing to specific targets, including for renewable energy in power and heating and cooling and for the electrification of heating and cooling. This report provides an overview analysis of the renewable energy policy and finance landscape in North Macedonia, based on desktop research and data publicly available. It provides an

overview of relevant national strategies and plans, as well as laws and regulations directly and indirectly affecting renewable energy investments in North Macedonia, focusing on power and heating and cooling. It also presents investment trends, available financing sources and mechanisms for renewable energy investments and an analysis of barriers and recommendations on renewable energy finance de-risking. It is developed as part of the support provided to North Macedonia under the Climate Promise co-operation framework between the United Nations Development Programme (UNDP) and the International Renewable Energy Agency (IRENA) (Box 1).

BOX 1. SUPPORT PROVIDED TO NORTH MACEDONIA UNDER THE CLIMATE PROMISE CO-OPERATION FRAMEWORK BETWEEN UNDP AND IRENA

Based on the request of the Ministry of Environment and Physical Planning of North Macedonia under the Climate Promise co-operation framework between UNDP and IRENA, this report aims to help North Macedonia accelerate the implementation of Agenda 2030 and NDCs through the identification of barriers and provision of recommendations for de-risking of renewable energy investments. It includes:

- an overview analysis of the renewable energy finance and policy landscape in North Macedonia based on desktop research and data available
- identification of specific barriers and associated risks which can hold back private-sector investment in renewable energy, focusing on power and heating and cooling
- recommendations on policy frameworks and financial de-risking instruments to scale up renewable energy investments based on IRENA's work, taking into account the need for a post-Covid recovery agenda that aims to achieve resilience, development and equality.

2. Overview of national strategies, plans, laws and regulations

North Macedonia, a non-Annex I party to the UNFCCC, ratified the Paris Agreement on 9 January 2018. As a non-Annex I country, North Macedonia does not have legally binding emissions reductions targets. However, its legal obligations stem from its membership in the Energy Community, which has been pushing for its renewable energy and climate change commitments. Moreover, according to the Paris Agreement all parties should aim at peaking and reducing greenhouse gas (GHG) emissions

and are obliged to submit updated NDCs with more and more ambitious GHG emissions reduction pledges.

The burning of fossil fuels accounts for almost 80% of the total GHG emissions in North Macedonia. The energy sector was responsible for more than 92% of GHG emissions in 2016, the remaining 8% resulting from agriculture, waste, industrial processes and product use (Figure 1).

2.1 STRATEGIES, PLANS AND COMMITMENTS TO DECARBONISE THE ENERGY SECTOR

North Macedonia has initiated an ambitious decarbonisation pathway that forms a solid basis for attracting renewable energy investments in the country. To date, such efforts have focused on renewable energy for power with some attention given to heating and cooling in the most recent strategy and plans.

North Macedonia's strategies, plans and commitments are outlined in key documents, which are detailed in this section. As of

August 2021, the documents include climate commitments in the NDCs, the NSED, the NECP, the Renewable Energy Action Plan for the Republic of North Macedonia until 2025 with vision until 2030, and the Long-Term Strategy and Law on Climate Action until 2050. Additional strategies and plans are still awaiting formal government adoption to enter into force, and the enhanced NDC was submitted in April 2021.

Figure 1. GHG emissions and removals (net emissions) by sector, gigagram (Gg) CO₂-eq, 1990-2016.



Notes: The Y-axis represents emissions per sector; FOLU= Forestry and other land use.

2.1.1 Climate commitments in NDCs

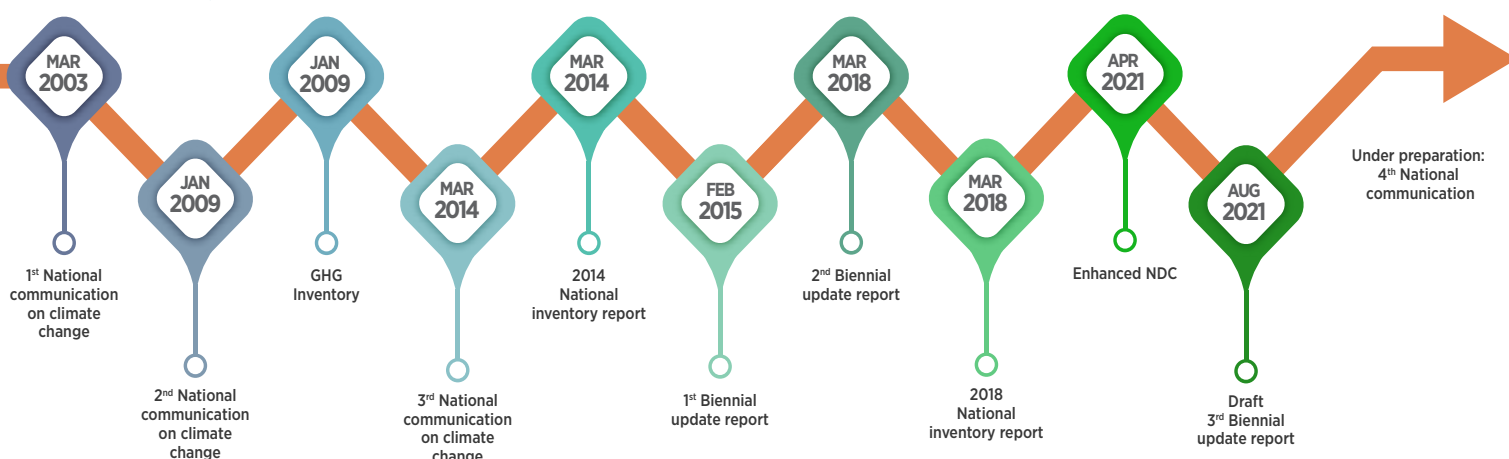
North Macedonia ratified the Paris Agreement in January 2018, and in its first NDC pledged a 30% reduction of carbon dioxide (CO₂) emissions from fossil fuels combustion by 2030 compared with the business-as-usual (BAU) scenario, and up to a 36% reduction by introducing additional measures at a higher level of ambition.

To date, three National Communications on Climate Change (NCCCs) and two Biennial Update Reports (BURs) have been submitted to the UNFCCC on the country's progress on its efforts towards GHG emissions reduction (Figure 2). The draft of the third BUR to the

UNFCCC was developed in August 2020 and the fourth NCCC is expected to be completed in 2021. The NCCCs, the BURs and the NDC have served as main strategic climate change documents in the country. The Third Biannual Update Report was submitted to the UNFCCC in June 2021.

In response to the call for considerably enhanced NDCs, North Macedonia submitted its enhanced NDC in April 2021 which sets a target of a 51% reduction in GHG emissions compared with 1990 levels. These targets expressed in net emissions means 82% reduction in 2030 compared with 1990 levels.

Figure 2. Timeline of submissions to UNFCCC



The enhanced NDC is in line with the Green scenario from the recently adopted NSED and is aligned with the 2030 targets and long-term goals stipulated in the NECP described below.

2.1.2 National Strategy for Energy Development up to 2040

In December 2019, the government adopted the NSED depicting three scenarios for the country’s energy transition in line with the energy policy trends at global and European levels. All three scenarios include renewable energy and cover power and heating and cooling. The Green scenario is the most ambitious and was used for the enhanced NDC.

The NSED provides a strategic plan for each policy and measure, and it details the administrative entity responsible for implementation, the time frame and the level of priority for each scenario. The three scenarios are presented in Table 1.

The Moderate Transition scenario and Green scenario both foresee a coal phase-out by 2025, making North Macedonia the first country in the Western Balkans to lay out concrete options for a pre-2030 coal phase-out, while the Reference scenario delays the closure of the Bitola lignite power plant until 2040. This contradicts the information on fuel supply/availability in the table that mentions 5 Mt of lignite production in 2018-35 and 3 Mt in 2035-40.

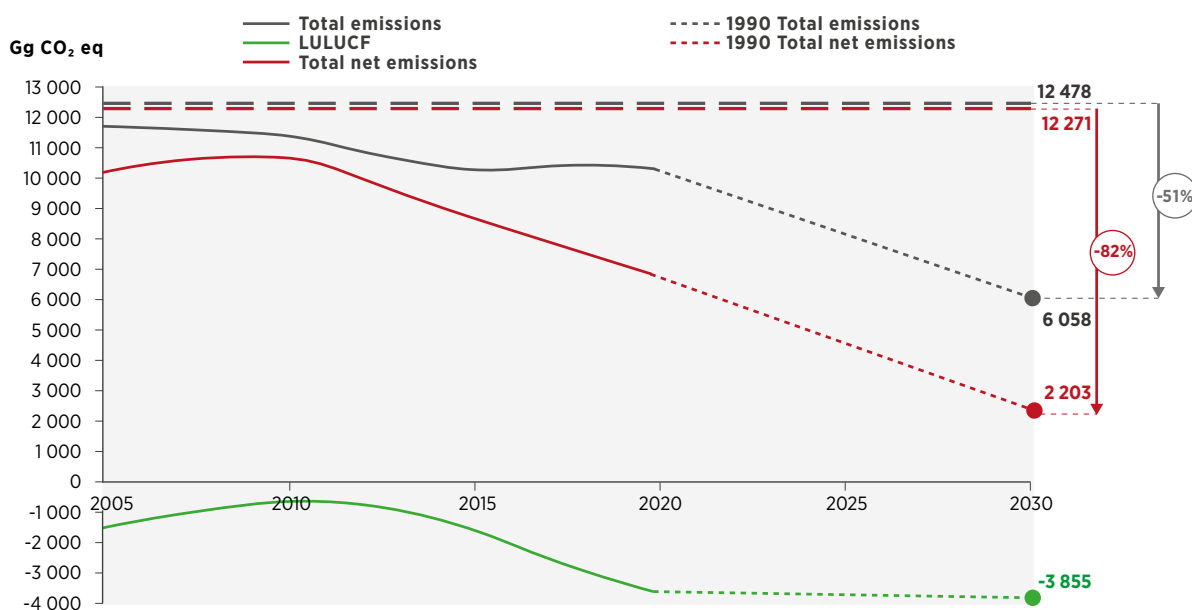
All three scenarios include the introduction of the European Union’s Emissions Trading System (ETS) but differ in terms of the year of introduction and the price of CO₂. Out of three scenarios, the Green scenario is the least-cost option (defined as the minimum cost to the total energy system, including investments, fuel prices, costs of transmission, distribution, and CO₂ price, in addition to support mechanisms and policies), making it likely for the country to move away from coal sooner rather than later.

For the first time, in the context of enhanced NDC preparation, gender indicators were introduced in some of the policy actions and measures with an aim to make them gender-responsive.

The policies and measures are mapped across five energy pillars in North Macedonia:

- **Energy efficiency:** energy savings up to 27.5% of final and 51.8% of primary energy by 2040 (in the Green scenario).
- **Integration and security** of energy markets: ensuring the integration of North Macedonia into European markets, without increasing its energy dependence, and providing the flexibility needed for increased integration of renewable energy (especially wind and solar).

Figure 3. GHG reduction target in the draft enhanced NDC report



Note: LULUCF = land use, land-use change and forestry, Gg CO₂ Eq = Gigagram CO₂ equivalent
 Source: MOEPP (2021a).

- Decarbonisation:** reduction in GHG emissions of up to 61.5% versus 2005 or 72.8% versus BAU (in the Green scenario), with an increase in the RES share in the gross final energy consumption in all scenarios. The renewables share in gross final energy consumption is planned to reach 33% (Reference scenario), 38% (Moderate Transition) and 40% (Green scenario) in 2030 and 35% (Reference scenario), 39% (Moderate Transition) and 45% (Green scenario) by 2040.

In all scenarios, photovoltaic (PV) and wind will be the most widespread technologies for electricity generation, with up to 1400 megawatts (MW) of solar PV (including 250 MW to 400 MW from rooftop PV), and 750 MW of wind. Regarding new hydropower plants, they should be carefully assessed to avoid negative social and

environmental impacts. All three scenarios entail supporting RES power through feed-in tariffs and feed-in premiums with auctions, especially during the period 2020-25 (see Section 2.2).

The strategy also promotes the decarbonisation of heating and cooling through the use of more efficient and large heat pumps; district heating from combined heat and power (CHP) plants running on gas and biomass (including residual biomass); thermal storage; electrification combined with energy efficiency to gradually replace current inefficient biomass usage; and combined systems for water heating utilising district heating, electricity and solar thermal systems.

Table 1. Energy strategy scenarios

	Reference scenario	Moderate Transition scenario	Green scenario
Vision	Transition from conventional energy based on current policy and least-cost principles	Progressive transition from conventional energy based on new policy and least-cost principles	Radical transition from conventional energy based on new policy and lignite phase-out
Demand drivers	<ul style="list-style-type: none"> Macedonian GDP growth to reach neighboring EU countries' GDP per capita levels of today by 2040 Current energy efficiency policies Penetration of EVs 	<ul style="list-style-type: none"> Same GDP growth as for reference Energy efficiency based on enhanced policy (in line with EU Directives / EnC guidelines) Highest penetration of EVs 	<ul style="list-style-type: none"> Same GDP growth as for reference Same as moderate transition but more incentives and advanced technologies Highest penetration of EVs
Generation investments focus	<ul style="list-style-type: none"> Lignite PP revitalisation choice based on least-cost principles High focus on RES investments 	<ul style="list-style-type: none"> Lignite PP revitalisation choice based on least-cost principles Further focus on RES investments 	<ul style="list-style-type: none"> Lignite PP revitalisation choice based on least-cost principles Extreme focus on RES investments
ETS entrance	2027	2025	2023
Commodity prices (WEO 2017)	Based on Current Policy Scenario	Based on New Policy Scenario	Based on Sustainable Development Scenario
Fuel supply/availability	<ul style="list-style-type: none"> Lignite production capped at a maximum level of annual supply expected (- 5 Mt 2018-2035, - 3 Mt 2035-2040) Hydropower production and wind/solar in line with historical trends and adjusted for new entering power plants Cross-border capacities (electricity and gas) evolution in line with the ENTSO-E, ENTSO-G and EnC Sustainable consumption of biomass Battery storage (EVs and pump storage) 		

Notes: ETS = Emissions Trading System; WEO = World Energy Outlook; GDP = gross domestic product; EU = European Union; EVs = electric vehicles; PP = power plant; EnC = Energy Community.

Source: North Macedonia (2019).

- **Research, innovation and competitiveness:** minimising total system costs taking into account country-specific conditions. Especially relevant are recommendations related to creating jobs and supporting new businesses, especially small and medium-sized enterprises (SMEs) in the field of renewable energy and energy efficiency; revising the business models of power plants and other key energy institutions, with the support of the government, to ensure competitiveness and address challenges including those related to the structure of the energy system; and building capacity in attracting international donor funds.
- **Legal and regulatory aspects:** the strategy emphasises full compliance with the Energy Community (EnC) acquis, with adopting the new Energy Efficiency Law and implementing four EnC Climate Action Group topics as well as the EnC environmental acquis.

The pillars outline different targets for each scenario and are aligned with the priorities stipulated from the 2018 Energy Law, which is the legal foundation for the country's energy policy and regulatory framework (see Section 2.2). Figure 4 outlines the targets set out for each of the pillars in the NSED up to 2040 for all scenarios.

Implementing the NSED will require estimated cumulative capital investments² ranging between EUR 9.4 billion and EUR 17.5 billion until 2040, depending on the selected scenario. Investments in RES and energy efficiency are at the core of all scenarios, opening considerable opportunities to access funds dedicated to the energy transition- mostly EU funds, international donors and financial institutions. The national budget also plays a big role in financing RES and energy efficiency projects. The same budget could have a role in the revamping of the Bitola power plant. However, it should be noted that in this case, the national budget would be diverted towards projects not in line with the NDC target and the country's decarbonisation efforts.

To achieve the goal of decommissioning existing lignite power plants by 2025, decisions should be made before the end of 2021. This necessitates action from stakeholders in the energy sector at various governance levels.

The NSED recommends establishing a steering committee, chaired by the deputy prime minister of economic affairs, to ensure its implementation. The government first needs to develop a programme for the implementation of the NSED, based on one of the scenarios. This should take place within six months after the strategy is adopted, which was still pending as of August 2021.

2.1.3 National Energy and Climate Plan

North Macedonia was the first Contracting Party to submit its draft NECP to the Energy Community Secretariat for review in July 2020. The Secretariat provided recommendations in November 2020, and the final NECP with targets is expected to be adopted in 2021.







The NECP covers the period from 2021 to 2030 and proposes 63 policies and measures for achieving the set targets and objectives for each of the five pillars of the NSED. In terms of energy efficiency, for instance, several policies and measures will be implemented in the period 2020-40 to minimise energy consumption in industry, buildings (households, public and commercial) and transport. Policies and measures to minimise losses in generation and in transmission and distribution networks will also be implemented.

The NECP states that *“since the secondary legislation that will deliver all these targets and roadmaps is still not developed, the NECP provides some indicative savings based on the Green scenario of the Energy Strategy that can be achieved in future, when all the requirements from legislative acts will enter into force.”* The targets set out in the NECP therefore include:

- **82% GHG net emissions reduction by 2030 relative to 1990 level**
 - 66% emissions reduction in the energy sector (mainly through decommissioning of coal-fired Oslomej power plant in 2021, and Bitola power plant will be fully closed in the period 2025-27)
- **38% share of RES in gross final energy consumption by 2030 (Figure 5):**
 - 66% share in gross electricity production
 - 45% share in gross final energy consumption for heating and cooling
 - 10% in final energy consumption in transport

² Only a few projects have been financed within the last decade(s) and the collected data come from different data sources, which prevents putting sources, instruments and technologies in relation to each other on an annual basis.

Figure 4. Targets for each of the pillars of the NSED up to 2040

Energy pillar	Indicator	Metric	Year 2030			Year 2040		
			Reference	Moderate transition	Green	Reference	Moderate transition	Green
Energy efficiency	Energy efficiency 	% reduction of primary & final energy consumption vs. BAU	15.3% primary 10.3% final	31.2% primary 16.6% final	34.5% primary 20.8% final	34.9% primary 14.2% final	47.9% primary 21.7% final	51.8% primary 27.5% final
Integration and security of energy markets	Energy dependence 	% of net import in primary energy consumption	48.7%	61.9%	59.1%	51%	61.9%	55.3%
Decarbonisation	GHG emissions 	% reduction vs. 2005 and vs. BAU	20.9% 22.9% vs. BAU	57.2% 58.3% vs. BAU	64.7% 65.3% vs. BAU	8.1% 35.6% vs. BAU	43.3% 60.2% vs. BAU	61.5% 72.8% vs. BAU
	RES share 	% of RES in gross final energy consumption	33%	38%	40%	35%	39%	45%
R&I and competitiveness	Total system costs 	Billion EUR in 2030 and 2040 with cumulative	3.8 41.0	3.3 38.3	3.2 37.3	5.1 86.5	4.8 81.2	4.5 78.1
Legal & regulatory aspects	Legal & regulatory compliance 	EnC acquis harmonisation & implementation	Full compliance			Full compliance		

Note: R&I = research and innovation.

Source: North Macedonia (2019).

- **Energy efficiency:**

- 27.5% savings of final energy consumption relative to BAU scenario
- 51.8% savings of primary energy consumption relative to BAU scenario.

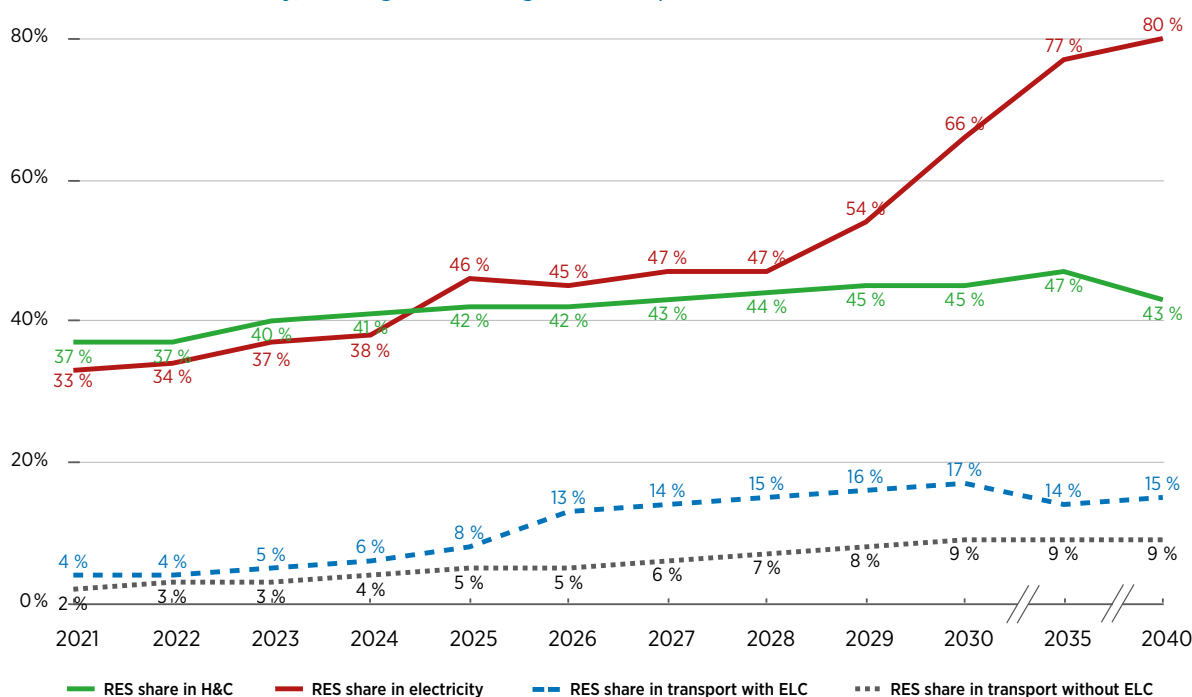
The NECP implements the NSED by selecting one of the scenarios (Green scenario) and detailing objectives, policies and measures necessary for its implementation. The NECP will have to be harmonised with all strategic and planning documents and relevant legislation which are in preparation/adoption phase or have been recently adopted, details of which are provided in the following sections:

- NDC
- NSED up to 2040
- Draft version of the Fourth National Energy Efficiency Action Plan
- Second Biennial Update Report on Climate Change
- Third Biennial Update Report on Climate Change
- Long-Term Climate Strategy
- Energy Law
- Energy Efficiency Law
- Draft version of the Law on Climate Action

The NECP outlines its own scenarios: Scenario with existing measures (WEM) and scenario with additional measures (WAM). Each of the suggested policies and measures in the NECP is modelled separately to analyse its effect (presented in the tables for each measure). But in the WEM and the WAM scenarios, all policies and measures are modelled together, to account for the interaction among them and to minimise the risk of over-sizing the system and making unnecessary investments.

The implementation of the WEM scenario is estimated to require about EUR 9.3 billion, most of it concentrated in the period 2026-30, while the implementation of the WAM scenario requires EUR 17.4 billion focused in the period from 2036-40 (Figure 6), with the difference being in the level of investments in energy efficiency measures. Renewable energy investments are expected to amount to EUR 1.9 billion by 2040 in the WEM scenario and EUR 2.8 billion under the WAM scenario. Table 2 presents a breakdown of the investment costs by measure.

Figure 5. Estimated trajectories for the share of renewable energy in final energy consumption in the electricity, heating and cooling, and transport sectors



Note: ELC = electricity

Source: MOE (2020).

2.1.4 National Renewable Energy Action Plan until 2025 with vision until 2030

The National Renewable Energy Action Plan (Renewable Energy Action Plan for the Republic of Macedonia until 2025 with Vision until 2030) (MOE, 2015) was submitted to the Energy Community Secretariat and adopted in November 2015. The NREAP, adopted in all EU countries and EnC Contracting Parties, outlined the development of RES in the countries, with national targets for the share of renewable energy in power, heating and cooling, and transport in 2020, as well as the measures to be adopted to achieve the set targets. North Macedonia also included a vision up to 2030 (see Table 4).

A biomass consumption revision was made after the first publication of the NREAP. Data were retroactively revised downward to 2009, resulting in a lower 2009 baseline renewables share of 17.2%, compared with the 21.9% baseline considered during the first target setting.

Following the downward revision of the biomass statistics, the EnC's Ministerial Council lowered the country's 2020 target from 28% to the current

23% in December 2018. In 2018, North Macedonia had 18% of renewable energy sources in total final energy consumption, making it distant from the indicative 22.3% target for 2018 in the amended NREAP.

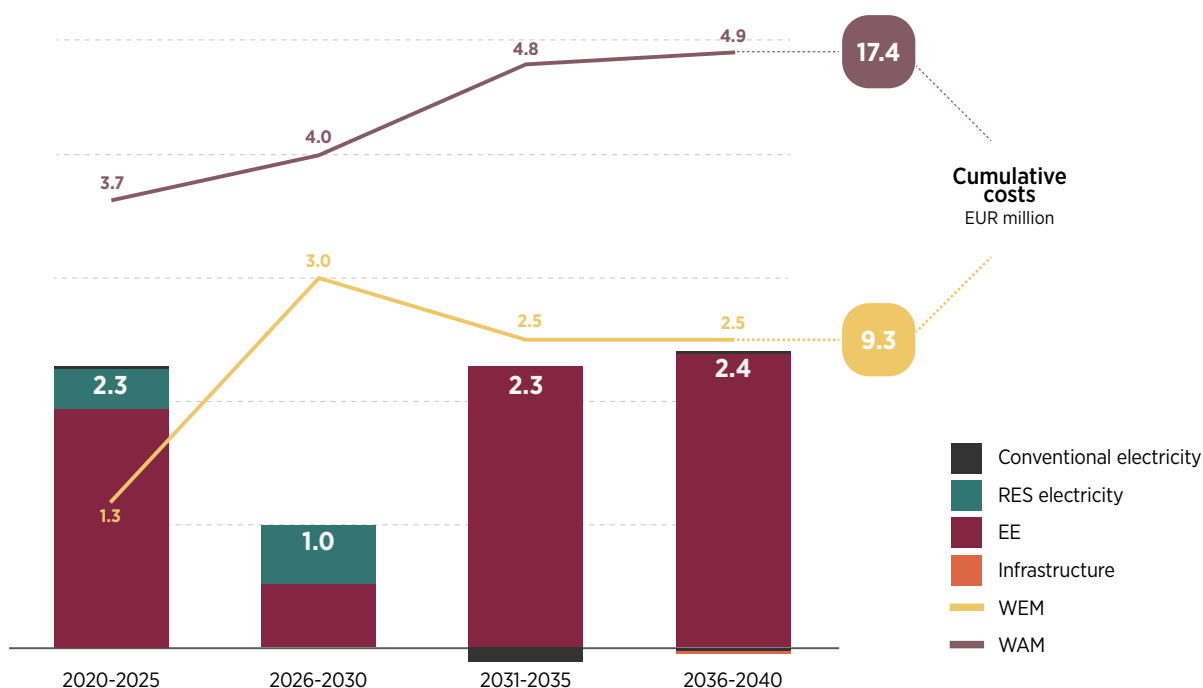
2.1.5 Long-term strategy and Law on Climate Action

An additional piece in the strategic and legal framework encompassing decarbonisation with renewable energy is the long-term strategy and a law on climate action, in line with the 2030 Climate and Energy Framework of the European Union. The Strategy was adopted in September 2021 and the adoption of the Law is underway. The Decision D/2018/2/MC-EnC of the Energy Community Ministerial Council in 2018 set the target of 23% share RES in gross energy consumption by 2020, up from 18% in 2018.

2.1.6 Latest development

Following general elections in July 2020, the new cabinet confirmed environmental protection and green development in North Macedonia to be one of the priorities for the next four years. The transformation of the energy sector will continue with an ambitious goal to increase

Figure 6. Investment costs by scenario, and the difference between the scenarios by type of investment in the energy sector (EUR million)



Note: EE = energy efficiency ; WEM = Scenario with existing measures; WAM = Scenario with additional measures

Source: North Macedonia (2019).

the share of renewables in power generation capacity to 50% by 2024. By 2024, all state institutions are supposed to abandon obsolete and environmentally damaging heating systems and switch to the district energy network, gas, efficient air conditioners or heat pumps instead (Todorović, 2020a).

As an overview, Table 3 presents the different shares of RES in gross final energy consumption in the NREAP, NSED and NECP. The law on climate action is described in Section 2.2.

2.1.7 Other plans in preparation

In addition to the enhanced NDC and long-term strategy and law on climate action, a number of strategies and plans supporting North Macedonian's NDC implementation are currently in drafting stage, awaiting formal approval process. They include:

- **Programme for realisation of the energy strategy** – required by the Energy Law together with the NSED, not adopted within six months of the adoption of NSED due to

circumstances related to the dissolution of the Parliament and early parliamentary elections, in addition to the COVID-19 crisis. Preparation of the document was supposed to start by mid-2020, and it was expected to be adopted in March 2021. Revisions of the Energy Strategy and of the draft NECP are planned as part of this programme, taking into account the changes due to COVID-19.

- **Fourth National Communication** (in preparation).
- **National Adaptation Plan** – planned for nexus approaches in the following areas: water, food, energy, health, biodiversity, tourism, forestry, disaster risk reduction, loss and damage, built-in infrastructure; not yet started.
- **Fourth Energy Efficiency Action Plan** (Draft) until 2021 – as an integral part of the draft NECP is under preparation and will be in line with the Law on Energy Efficiency and with the reporting requirements of the Energy Efficiency Directive 2012/27/EU.

Table 2. Investment costs by measure under WEM and WAM scenarios (EUR million)

	Policy/measure	WEM	WAM
PM_D1	Introduction of CO ₂ tax	-	-
PM_D2	Reduction of CH ₄ emissions from enteric fermentation in dairy cows by 3%	0.2	0.2
PM_D3	Reduction of N ₂ O emissions from manure management in dairy cows by 20%	1.0	1.0
PM_D4	Reduction of NO ₂ emissions from manure management from swine farms by 13%	1.0	1.0
PM_D5	Reduction of N ₂ O emissions from manure in dairy cows by 20% for farms below 50 livestock units	1.0	1.0
PM_D6	Establishment of integrated forest fires management	1.5	1.5
PM_D7	Afforestation	7.8	7.8
PM_D8	Conversion of land use of field crops above 15% inclination	1.5	1.5
PM_D9	Contour cultivation on areas under field crops on inclined terrains (5-15%)	1.0	1.0
PM_D10	Perennial grass in orchard and vineyards on inclined terrains (>5%)	1.0	1.0
PM_D11	Use of biochar as a carbon sink on agricultural land	30.0	30.0
PM_D12	Landfill gas flaring	20.5	20.5
PM_D13	Mechanical and biological treatment (MBT) in new landfills with composting	36.1	36.1
PM_D14	Selection of waste - paper	2.0	2.0
PM_D15	Improvement of waste and materials management at industrial facilities	-	-
PM_D16	Programme for a just energy transition	-	-
PM_D17	Identification of the proper location/sites for solar and wind power plants	-	-
PM_D18	Large hydropower plants	1716.2	1716.2
PM_D19	RES without incentives	777.0	1325.5
PM_D20	Photovoltaic irrigation	47.0	47.0
PM_D21	Incentives for feed-in tariff	356.9	356.9
PM_D22	Incentives for feed-in premium	240.6	240.6
PM_D23	Solar rooftop power plants	227.1	263.4
PM_D24	Solar thermal collectors	16.2	70.0
PM_D25	Biomass power plants (CHP optional)	24.3	24.3
PM_D26	Development of the biofuels market	-	-
PM_EE1	Energy efficiency obligation schemes	182.0	182.0
PM_EE2	Retrofit existing residential buildings	941.8	1708.2
PM_EE3	Retrofit existing central government buildings	55.0	170.0
PM_EE4	Retrofit existing local-government buildings	50.0	150.0
PM_EE5	Retrofit existing commercial buildings	530.0	530.0
PM_EE6	Construction of new buildings	474.1	282.7
PM_EE7	Construction of passive buildings	-	1068
PM_EE8	Improvement of the municipal street lighting	19.5	25.3

PM_EE9	Green procurements	16.0	24.0
PM_EE10	Labelling of electric appliances and equipment	71.0	71.0
PM_EE11	Increased use of heat pumps	235.0	474.4
PM_EE12	Public awareness campaigns and network of energy efficiency (EE) information centres	630.0	704.0
PM_EE13	Phasing out of incandescent lights	177.6	558.0
PM_EE14	Energy management in manufacturing industries	-	-
PM_EE15	Introduction of efficient electric motors	99.7	113.0
PM_EE16	Introduction of more advanced technologies	141.8	438.6
PM_EE17	Increased use of the railways	180.6	180.6
PM_EE18	Renewal of the national car fleet	1599.5	2167.7
PM_EE19	Renewal of other national road fleet	2 300.0	2 300.0
PM_EE20	Advanced mobility	-	-
PM_EE21	Construction of a railway to Bulgaria	720.0	720.0
PM_EE22	Transport electrification	1201.7	8 292.3
PM_EE23	Increased use of central heating systems	3.2	3.2
PM_EE24	Smart communities	-	-
PM_EE25	Reduction of network losses	170	170
PM_IEM1	Construction of 400 kV electricity transmission interconnection Macedonia-Albania (Bitola-Elbasan)	34.0	34.0
PM_IEM2	Development of natural gas cross-border infrastructure to diversify supply routes and increase market competitiveness	-	-
PM_IEM3	Development of gas transmission network	200.0	200.0
PM_IEM4	Development of a gas distribution network	-	-
PM_IEM5	Pursue regional electricity market integration	-	-
PM_IEM6	Further develop the distribution system network to integrate more RES, including prosumers and more electric vehicles (EVs), as well as continuously improve network reliability	-	-
PM_IEM7	Price signal demand response	-	-
PM_IEM8	Adoption of annual programme for vulnerable consumers	-	-
PM_RIC1	Participation in the development of energy transition technologies and measures	-	-
PM_RIC2	Increased level of education on sustainable energy needs	-	-
PM_RIC3	Inter-sectoral and geographical mobility of researchers	-	-
PM_RIC4	Increase the role of SME sector in the energy transition	-	-
Total		13 542.4	24 715.5
Total renewables		1924.1	2 802.1

Note: WEM = Scenario with existing measures; WAM = Scenario with additional measures.

Source: MOE (2020).

2.2 NATIONAL LAWS AND REGULATIONS

North Macedonia has developed a strong policy framework, capable of attracting renewable energy finance, especially in the power sector which can extend to the electrification of heating and cooling. The country's strategies and plans are based on an already existing legal framework for renewable energy, which continues to develop with the renewable energy reforms. The 2018 Energy Law and its accompanying decree, decision and programme on renewable energy are the basis of this framework.

2.2.1 New Energy Law (Official Gazette 96/2018 and 96/2019)

The Energy Law was adopted in May 2018 and it harmonises the existing energy legislation of North Macedonia with the EU Third Energy Package. An amendment to the Energy Law to provide a legal basis for the NECP, in addition to harmonised and streamlined reporting on energy and climate targets, was still pending as of August 2021.

For heating and cooling, the sectoral target for the share of renewables in the NREAP (Energy Community, 2020) was exceeded. This may be partly due to the target being conservative. In addition, the use of pellet stoves and the deployment of solar thermal collectors have been encouraged since 2016 through a reduction of the value-added tax on these systems from 18% to 5%. More opportunities are targeted in the horizon of 2030 and 2040 based on the NSED and NECP.

In the power sector, the law regulates the provision for two types of supportive measures for renewable-based electricity generation: a

feed-in tariff (FiT) that is administratively set and the feed-in premium (FiP) that is offered following competition (i.e. auction) to selected power producers. The FiP may be used as an alternative to the FiT. These are the main innovations introduced by the recent legislative changes.

In February 2019, the government adopted the following legal acts for the deployment of renewables in the power sector: a decree with measures to support renewable-based power generation (MOE, 2019a), a decision regarding the total capacity allocated to preferential power producers (MOE, 2019b) and the programme for financial support for the production of electricity from preferential producers using a premium for 2019 (MOE, 2019c).

According to the decree on support measures for electricity production from RES, FiTs are provided to hydropower plants with maximum capacity of 10 MW, wind power plants up to 50 MW, and biomass and biogas thermopower plants up to 1 MW. Capacity caps are in place and the government can decide if there is a need to change the cap for the total installed capacity of preferential generators.

FiPs are only awarded to selected wind power plants of up to 50 MW and PV plants up to 30 MW. No caps are in place for small hydropower or wind power plants. The cap for PV plants that receive the FiP is 200 MW.

The FiPs are granted following an electronic auction. The selection criterion is financial only: the lowest bidders are selected first. Winning bidders have to complete the projects within three years. The Ministry of Economy conducts the procedures for selecting the bidders and is also responsible

Table 3. Share of RES in gross final energy consumption in the NREAP, NSED and NECP

Document	Share of RES in gross final energy consumption			
	2020	2025	2030	2040
NREAP until 2025 with Vision until 2030	23%	23.90%	25%	
NSED up to 2040			Reference scenario 33%	Reference scenario 35%
			Moderate Transition 38%	Moderate Transition 39%
			Green 40%	Green 45%
NECP			38%	42%

Source: MOE (2020); North Macedonia (2019); MOE (2015).

BOX 2. RESULTS OF THE TWO SOLAR PV AUCTIONS HELD IN 2019 AND 2020

The auctions resulted in 11 awarded projects totalling 35 MW that would be built on state-owned land, and would receive an average FiP of EUR 4/MWh, and 24 projects totalling 21 MW that would be installed on private land and would receive an average FiP of EUR 11/MWh. Producers have to complete the projects within three years in order to qualify for the premiums.

In February 2020, an auction was launched for the installation of two PV projects of up to 100 MW on a coal mine site in Oslomej, Kicevo without any support. This presents an example of how regions that depend on coal can transition to renewables in a just and inclusive way, by providing job opportunities for coal workers and supporting sustainable development of the region. The result of the auction was still pending as of August 2021.

for administering the agreements and paying the premiums using funds allocated from the state budget (MOE, 2019d). The maximum premium for 2019 was EUR 15 per megawatt hour (MWh).

FiT is based on the first come, first serve principle up to the prescribed capacity stipulated in the governmental decisions (wind 160 MW (only 10 MW are available), solar 17 MW (all operational already), biomass 10 MW (9.9 MW are available), biogas 20 MW (9 MW are available). There is no limit for hydropower.

To date, two solar PV auctions have been held – in 2019 and 2020 – bidding for the FiP on top of the price of each kilowatt-hour sold on the wholesale electricity market. The results are summarised in Box 2.

Several decisions are still pending to fully cover support to renewable energy development:

- **Self-consumption** is supported through the rulebook on renewable energy adopted in 2019, and implementation is not yet in place through an open scheme. The Ministry of Economy published in 2021 a programme for promotion of RES and a public call for subsidies for PV installations.
- **The secondary act** enabling implementation of an electronic system compatible with the standardised European Energy Certificate System for guarantees of origin is pending. The Energy Agency of the Republic of North Macedonia was designated by the Energy Law as the body responsible for issuing, transferring and cancelling guarantees of origin.

2.2.2 Law on Strategic Investments

On a broader level, North Macedonia adopted the Law on Strategic Investments (De Jure, 2020) in January 2020 to create the conditions to encourage and attract investments into strategic projects. Those are defined as projects meeting one or more objectives of item 1.1 of the Public Call including investment of at least EUR 100 million extending in at least two municipalities, a minimum of EUR 50 million in municipalities based in a city and a minimum of EUR 30 million in municipalities based in a village. Projects in the field of energy are among the 13 priority areas covered in a public call (Government of the Republic of Northern Macedonia, 2020) and the deadline to submit applications for strategic investment projects was the end of January 2021.

2.2.3 Energy Efficiency Law

The Law on Energy Efficiency was passed in February 2020 with the relevant by-laws. The law drives adoption of RES in buildings and hence provides a legal basis to fulfil future efforts to electrify the heating and cooling sectors. The law covers end-to-end energy supply, transmission and distribution of energy. The scope of the law entails regulations for buildings to increase their energy codes. Finally, the law targets large energy users, including the public sector, traders and providers of energy services.

2.2.4 Law on climate action

The law will introduce obligations for the development of a long-term strategy on climate action and the needed institutionalisation of the national GHG emissions inventory system. It is expected to be adopted by the end of 2021.

3. Overview of renewable energy finance

North Macedonia's renewable energy finance landscape reflects the overall picture in Southeast Europe with traditionally a strong role of public finance from international sources. However, North Macedonia has taken an active approach in creating a framework to attract private investors, through market liberalisation and targeted

measures such as FiTs, FiPs and auctions. This has resulted in growing interest of private investors in past years. The power sector currently dominates the renewable investment mix. The overall picture of renewables investment is diversified across different types of technologies, including solar, wind, small hydropower and geothermal.

3.1 CURRENT LANDSCAPE OF RENEWABLE ENERGY FINANCE

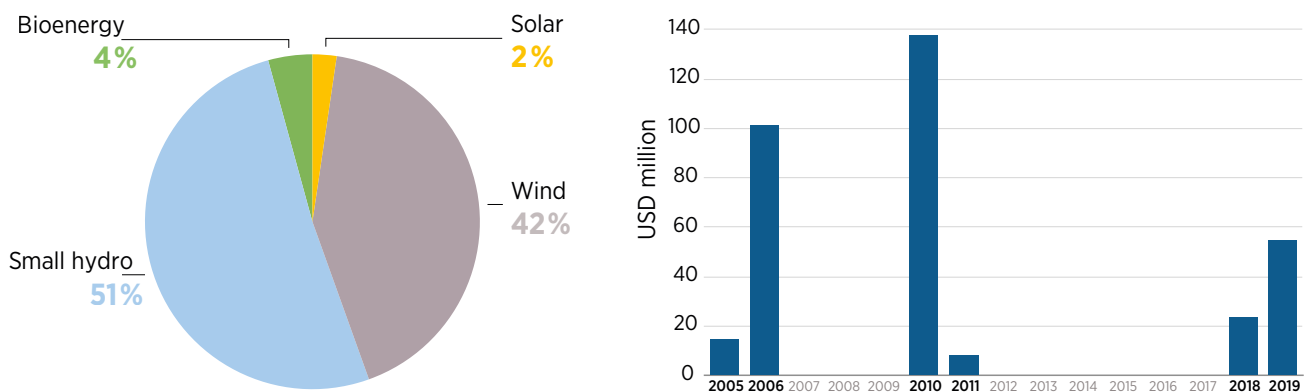
Financing for renewable energy in North Macedonia has been traditionally dominated by public finance from international and domestic sources. With the development of a more sophisticated policy and regulatory framework, opportunities have recently been created for private finance, for example through renewable energy auctions in 2019 and 2020.

According to BloombergNEF (BNEF) (Figure 7), a total of USD 340 million was invested in renewable energy in North Macedonia during 2005-19. More than half of this (USD 174.2 million) was invested in small hydropower and 42% in

wind energy with the remaining 7% split between solar and bioenergy.

Over the total period, investments were relatively low, apart from peaks in 2006 and 2010, when project announcements on wind projects happened. In 2018 and 2019, following changes in support policies based on the 2018 Energy Law, investments seem to have started a growing trend. These data do not include the results of the auctions held in 2019 and 2020, which are expected to have a positive impact on the overall investment.

Figure 7. Overview of renewable energy investment, 2005-2019 by technology (left side) and year (right side)



Source: BNEF (n.d.).

3.1.1 Public finance

Public finance has so far been the most important driver for renewable energy development in North Macedonia. Based on IRENA's public finance data, a total of USD 115.77 million (34% of total investment) was invested by international public financial institutions in renewable energy in North Macedonia between 2000 and 2018. The German development bank KfW and the European Bank for Reconstruction and Development (EBRD) dominate with 85% (KfW) and 11% (EBRD). Japan International Cooperation Agency (JICA) and UNDP are among other investors representing, together, less than 4% of the remaining amount.

Domestic public finance has been channelled to the renewable energy sector through grant-based schemes including:

- Almost EUR 1.5 million was distributed to 36 municipalities for solar PV in 2018 installed on 108 public buildings with total installed capacity of 1 620 kilowatts peak. The budget was allocated under the EU Instrument for Pre-Accession Assistance and through the Municipal Services Improvement Project within the Ministry of Finance.
- In the period 2007-21, North Macedonia granted subsidies for the installation of the solar thermal in 8 113 households. Total funds that were granted amount to around MKD 112.4 million (Macedonian denars) (EUR 1.828 million) and were provided by the Ministry of Economy, which gives back to buyers 30% of the investment made in the equipment. The maximum subsidy per household was set at EUR 300 and EUR 150 in 2021.

- In 2016, in order to support the usage of pellets and pellet stoves, the government adopted a reduction in the value-added tax rate for pellets from 18% to 5%. This measure was in force in January 2017. In the period 2018-21, 2 488 households that bought a pellet stove were subsidised by the Ministry of Economy. The total budget spent for this stimulus is around MKD 75 million (EUR 1.22 million) (MOE, 2019b).
- In 2016, the city of Skopje introduced support schemes for purchasing pellet stoves to support the use of RES for heating in households. The funds for implementation of this activity were secured by the city budget, amounting to MKD 5.89 million (EUR 95 000). This budget was increased to EUR 208 000 in 2017 and amounted to EUR 91 000 in 2018. This incentive provides a refund of up to 70% of the total value of pellet stoves, limited to MKD 30 000 (EUR 500) per household. In the period between 2016 and May 2018, 812 households were subsidised (1 161 applications) (MOE, 2019b).
- Cross-sectoral support mechanisms that benefit renewable energy include a fund for technology development and innovation, and a public fund that offers technical assistance to SMEs and provides co-financed grants for start-up and spin-off companies, in addition to conditioned loans and co-financed grants for innovation commercialisation for various sectors, including renewables (MOE, 2020).

Table 4. Overview of publicly financed renewable energy projects in North Macedonia, 2000-2018

Project	Year	Investor	Technology	Asset class	Amount (USD million)
Feasibility study: Boskov Most IPP hydropower	2000	Others	Hydropower	Grant	0.35
Boskov Most IPP hydropower	2002	Others	Hydropower	Grant	0.04
Bilateral - Mont. Programme Mac Wind Resource	2004	Others	Wind	Grant	0.29
Promotion of solar energy – support of production and training	2005	Others	Solar	Grant	0.45
Geothermal energy Kocani	2006	Others	Geothermal	Grant	2.1
Project not identified	2006	Others	Bioenergy	Grant	0.31
Bilateral wind energy	2007	Others	Multiple renewables	Grant	0.1
Ecological reorganisation and improvement of energetic efficiency of the geothermal system Geoterma, Kocani	2009	Others	Geothermal	Grant	0.31
Promoting renewable energy sources and energy saving	2009	Others	Multiple renewables	Grant	0.11
Energy efficiency/renewable energies II	2010	KfW	Multiple renewables	Loan	35.99
Energy efficient agriculture	2010	Others	Bioenergy	Grant	0.37
Energy efficiency and renewable energies II	2011	KfW	Multiple renewables	Loan	43.22
Energy efficiency and renewable energy, phase III – Wind Park Bogdanci	2013	KfW	Hydropower	Loan	19.04
Aggregated activities	2016	JICA	Multiple renewables	Grant	0.01
Energy management at the local level	2016	UNDP	Multiple renewables	Grant	0
Project non identified	2017	EBRD	Multiple renewables	Other official flows (non-export credit)	4.82
Aggregated activities	2017	JICA	Multiple renewables	Grant	0.01
ELEM Solar Project photovoltaic plant	2018	EBRD	Solar	Loan	8.27
Total					115.77

Note: IPP = independent power plant.

Source: IRENA (n.d.).

3.1.2 Private finance

Private finance has been delivered so far in the form of equity and debt with active contribution of blended and climate finance. The utility Elektrani na Severna Makedonija (Electricity Company of North Macedonia [ELEM]) AD has been the key equity provider for renewable energy projects (such as Bogdanci Wind Farm Phase I and II among at least four other projects). Other equity providers include local Makpetrol AD Skopje (Makpetrol Ilinden Biodiesel Plant), Turkish NeSa Energy (NeSa Energy Bogdanci Wind Farm) and Korea South-East Power Co Ltd with Samsung Heavy Industries Co Ltd (Samsung Heavy and KEPCO Stip wind farm).

The overall private equity provided on USD 205.97 million of seven completed deals closed during 2005-18 (for which information is available) was less than USD 84 million. The advantage of receiving equity financing is that, in addition to capital contribution, project developers can benefit from investors' technical or commercial know-how during development, construction and operation phases. Meanwhile, debt financing amounted to USD 70 million for the same total of seven completed deals originating from public finance institutions, namely EBRD and KfW.

Commercial banks have recognised the importance of targeting renewable energy businesses and have started to actively participate in renewable energy projects. Several local banks have provided capital for renewable energy projects to SMEs and residential customers (Table 5).

Table 5. Overview of financing for clean energy (renewables and energy efficiency) from commercial banks by target customer

Bank	Target customer segment	IFI support
Halkbank	Residential	GGF
Halkbank	SMEs	MBDP
Komercijalna Banka	SMEs	MBDP
NLB Tutunska Bank	SMEs	REEP/WebSEFF 2
NLB Tutunska Bank	SMEs	MBDP
Ohridska Banka SG	SMEs	REEP/WebSEFF 2
Ohridska Banka SG	SMEs	MBDP
Ohridska Banka SG	SMEs	GGF
Procredit Bank	SMEs / Residential	
Unibank	SMEs	MBDP

Notes: GGF = Green for Growth Fund. Information about the split between renewable vs energy efficiency projects is not available; MBDP = Macedonian Bank for Development Promotion; REEP = Renewable Energy and Energy Efficiency Partnership; WebSEFF 2 = Western Balkans Sustainable Energy Finance Facility 2.

Source: Based on websites of the banks.

Among financing sources, aside from public and private finance, North Macedonia has benefited from regional blended finance instruments, such as the Green for Growth Fund (GGF). The GGF is an investment fund that aims to mitigate climate change and support sustainable development, mainly by investing in actions that aim for lower energy consumption, use of resources and GHG emissions. The fund is an early and successful example of blended finance structure, formed by a public-private partnership that leverages risk capital from public institutions with private capital

to increase investment volumes and channel them to regions and sectors that would not otherwise attract such flows. The dedicated financing is channelled to households and businesses via local financial institutions, and through direct investments to eligible projects. A Technical Assistance Facility offers technical expertise and know-how to support the successful implementation of these investments. So far, the bulk of projects financed have focused on energy efficiency rather than renewable energy with no record of green bonds being used.

3.2 FUTURE DEVELOPMENT OF RENEWABLE ENERGY FINANCE

3.2.1 Financing needs and requirements

In order to achieve a cost-competitive transition, the NDES assumes cumulative capital investment needs in the range of EUR 9.4 billion to EUR 17.5 billion until 2040, depending on the selected scenario. An overview of the renewable energy budget estimates a total of EUR 1.36 billion by 2040 (or EUR 68 million annually on average) and is detailed in Table 6. This is a cumulative amount including various sources of finance such as private finance, incentives through consumer bills and the central government budget.

North Macedonia could leverage a combination of public and private finance sources to cover its renewable energy development needs in the coming decades. The country already has a few avenues which could boost public finance in support of private investment.

As a pre-accession country, North Macedonia can benefit from various donor funds supporting RES. In addition, access to programmes and funds is expected to increase significantly after North Macedonia joins the European Union. In addition, the country can also tap into a substantial amount of funds from international donors and institutions.

For domestic public finance, with the increasingly introduced measures for the development of small-scale RES and energy efficiency, the national budget will play an increasingly

important role in providing financial support to households and SMEs. This could entail realigning public finance flows and/or adopting fiscal policies and measures. Also, there could be an opportunity (still to be assessed in terms of potential to finance NDC measures), to cover some of the renewable energy investment costs through a carbon tax.

The current landscape of renewable energy policy and finance offers several avenues for boosting the country's renewable energy potential. The main objective is to provide a pool of liquid funding at an attractive cost of capital that can cover the needs of upfront infrastructure development. However, there are some barriers that continue to slow down investments in the sector. They include: missing renewable energy finance framework that combines public and private sources and allocates the national budget needed; insufficient leverage of private investments through public finance; low caps on installed capacity supported by the FiT and FiP resulting in low investor confidence; continued fossil fuel subsidies and support for ageing and inefficient power plants; and lack of support for co-generation, retrofitting of buildings, and other renewable-based heating and cooling aside from traditional biomass. They are analysed in the next chapter.

Table 6. Overview of key financing requirements for RES by 2040

NECP measure	Assumptions	Budget* (Million EUR)	Source of finance
Incentives FiT	By 2040, the FiTs are expected to result in the installation of an additional 86 MW of wind, 13 MW of biogas and 92.5 MW of small hydropower plants	356.9	Private, incentives through consumer bills
Incentives FiP	By 2040, the FiP is expected to result in the installation of an additional 200 MW of solar and 64 MW of wind power plants	240.6	Private, incentives from the central government budget
Rooftop Solar PV	400 MW of solar is expected to be installed by 2040.	263.4	Private, donors, subsidies from national and local budget, EE fund
Biomass power plants (CHP optional)	By 2040, the FiTs are expected to result in the construction of 15 MW biomass power plants	24.3	Private, incentives through consumer bills
Increased use of heat pumps	Heating appliances with resistive heaters are expected to be gradually replaced with heat pumps, and the share of heat pumps in heat demand is expected to reach 55% in 2040.	474.4	Private, EE fund, incentives from the central and local government budget, donors
Total		EUR 1 360	

* Budget refers to the cumulative investment cost.

Source: MOE (2020).



4. Barriers and associated risks to private-sector investment in renewable energy in North Macedonia

A number of barriers exist to developing North Macedonia's renewable energy potential. Financing of renewable energy projects is challenging due to both the high cost of capital, resulting from investors' perception of risk, and existing market barriers.

The following analysis breaks down the existing barriers to financing renewable energy in North Macedonia, as a basis to identify recommendations to enhance private-sector investment in renewable power generation and for heating and cooling.

Globally, barriers to renewable energy investment typically pertain to three main areas: i) project start-up and development; ii) investment risk

management; and iii) scaling up of investment as detailed in Figure 8.

At the project start-up and development stage, barriers include the limited experience and capacity of local financial institutions, and limited availability of investment-ready projects stemming from limited experience with project development in early-stage markets, which can result in a limited access to capital.

In addition, there exist a variety of risks that translate into barriers in early-stage renewable energy markets and can add a risk premium to the cost of capital, limiting access to affordable finance. Political risk is associated with local events that may adversely affect renewable projects. Policy and regulatory risk stems from lack of or changing

Figure 8. Types of investment constraints in renewable energy

Project start-up and development	Investment risk management	Scaling-up investment
<ul style="list-style-type: none"> • Limited experience in the financial sector • Availability of investment- ready projects • Limited access to capital 	<ul style="list-style-type: none"> • Political risk • Policy and regulatory risk • Counterparty risk (power-taker risk) • Grid interconnection and transmission line risk • Currency risk • Liquidity and refinancing risk • Resource risk • Technology risk 	<ul style="list-style-type: none"> • Insufficient investment size and high transaction costs • Financial regulations restraining illiquid and riskier investments

Source: IRENA (2016).

policy and regulatory landscape for renewables. Counterparty risk relates to the risk of default by the off-taker, which is typically the electricity utility. Grid and transmission risk is associated with any limitations and lack of transparency related to the electricity grid and its operation, which may limit the feed of electricity. Technology risk is based on the lack of expertise and use of new technology in the market and unskilled labour force. Currency risk is related to the changing or volatile exchange rate which adversely impacts the value of investment. This risk arises when project revenues are in local currency and loan payments in a hard currency (e.g. USD or EUR). Liquidity risk stems from revenue shortfalls (when utilities are affected by liquidity constraints, for example) or mismatches between the timing of cash receipts and payments. Refinancing risk can arise when the borrower is unable to refinance the outstanding loan midway through the life of a project due to

inadequate loan terms (e.g. if the maturity of a loan is mismatched with the lifetime of the asset). Resource risk is associated with the characteristics of renewables such as variability and future price uncertainty that create a risk for the investors as well as supply of renewable resources such as pellets or water for hydropower generation.

Finally, barriers to scaling up investments in renewable energy are related to insufficient investment size leading to high transaction costs for institutional and other large-scale investors. Financial regulations can also restrain banks and institutional investors from investing in illiquid or risky assets. These investors may therefore be discouraged from providing long-term lending to renewable energy projects.

IRENA's analysis of risks and barrier for renewable energy investments (IRENA, 2016) is applied to the case of North Macedonia in the next section.



Table 7. Overview of investment barriers in North Macedonia

Type of barrier	Specific barrier or risk	Relevance for NM
Project start-up and development	Limited experience in the financial sector	High
	Availability of investment-ready projects	Medium
	Limited access to capital	High
Investment risk management	Political risk	Low
	Policy and regulatory risk	Low
	Counterparty risk	Medium
	Grid interconnection and transmission line risk	Medium
	Currency risk	Low
	Liquidity and refinancing risk	Medium
	Resource risk	Medium
Scaling up investments	Technology risk	Medium
	Insufficient investment size and high transaction costs	High
	Financial regulations restraining illiquid and riskier investment	High

	High relevance	High
	Medium relevance	Medium
	Low relevance	Low

Source : IRENA (2021).

4.1 OVERVIEW OF BARRIERS TO RENEWABLE INVESTMENT IN NORTH MACEDONIA

The existing barriers spread across all three main areas identified by IRENA to a varying degree which is detailed in Table 7 using a three-level scale of relevance (low, medium, high relevance).

The relevance of these barriers to renewable investment is medium to high in North Macedonia except for political risk, currency risk, and policy and regulatory risk with low relevance. With respect to policies and regulations, the country

has made substantial progress since the adoption of its National Energy Strategy in 2019 which is reflected in the low relevance, even though a number of actions still remain to be implemented to improve the country's policy and regulatory framework.

The relevance of specific barriers is estimated in the context of North Macedonia to identify those that need to be tackled as a priority.

4.2 BARRIERS TO PROJECT START-UP AND DEVELOPMENT

In terms of **project start-up and development**, the financial sector in the country has limited experience in the financing of renewable energy projects. With a total of USD 340 million invested

between 2005 and 2019 – or about USD 24 million per year on average – there has been a limited opportunity for the sector to learn so far. More than half of this investment was targeted at small

hydropower projects, while more learning is required in wind, solar, geothermal and biomass. Some knowledge base has been developed by the financial sector in grant-based schemes given that several of them have been distributed, especially since 2015 (see Section 3.1). This trend continues with additional grants and subsidies being rolled out in 2021 for the installation of biomass stoves (ECIKS, 2021). Also, commercial banks have been offering capital for renewable projects, alongside energy efficiency projects for SMEs and residential customers, creating an opportunity for learning (Spasić, 2020).

Overall, the financial sector in the country needs additional experience and enhanced capacity in providing **access to capital** for larger-scale solar, wind and other new renewable energy technologies as well as new blending approaches, using public capital to leverage private finance. The **availability of investment-ready projects** was limited before the introduction of renewables auctions in 2019. As a result, in 2020, the

government signed contacts with 9 companies for investments in state land, and with 23 investors for projects on private land. Moreover, in early 2021, the government announced its intention of adding 60 MW of solar PV through a FiP in the first half of the year. The expectation is to mobilise at least EUR 35 million in investments. These recent developments could improve the availability of investment-ready projects in the country depending on the quality of the project. Access to capital for financing these projects remains to be confirmed with the advancement of their development. Another positive development, based on the available information, is that some of the projects received grants for feasibility studies (Spasić, 2021) while ESM, the state-owned electricity company, signed a grant agreement with KfW for EUR 2.4 million (USD 2.9 million) in green energy investments, including solar PV, wind and small hydropower in February 2021 (Petrushevskaa, 2021)

4.3 BARRIERS TO INVESTMENT

North Macedonia presents several barriers to renewable energy investment with a varying level of relevance. The barriers are a reflection of the investors' perception of risk related to renewable energy investments.

Political risk is low, following a period of two decades when substantial political reform has been accomplished. The progress of negotiations will continue to have an impact on investment in the coming years with the ultimate EU membership expected to take time.

Similarly, the Macedonian denar is pegged to the euro and consequently currency risk is low for renewable investors.

The **policy and regulatory framework** has improved significantly with the adoption of the NSED, the NECP and most recently the commitments embedded in the enhanced NDC. The risk related to the policy and regulatory framework is medium, given that there remain some regulatory barriers in the country, including:

- **Low caps on installed capacity** supported by FiTs and FiPs and lack of longer-term plans for caps with details on technology, timelines and location for auctions. In terms of renewables,

various experts and donors expressed concerns that the current supporting mechanisms may favour specific renewable energy technologies; for instance, small hydropower plants presently have no capacity threshold, whereas there are caps on solar and wind technologies. To date, two competitive auctions have been held and a comparative analysis can provide an understanding of the efficiency, effectiveness, impact and costs of the existing support mechanisms for renewable energy technologies and can help identify the most suitable support mechanism for the country's long-term renewable energy transition. Currently, the caps imposed on the total installed capacity for wind, solar, biomass and biogas technologies through the Decision on the Total Installed Capacity of Preferential Electricity Producers (MOE, 2019b) may prevent the country from reaching its renewable energy target of 21.2% in 2020, especially with the quotas being filled already with operational or planned plants. In addition, while the premiums were introduced in the North Macedonian energy market through the recent auctions, they are yet to be granted in

practice, so only then will the actual functioning of the market eventually show how efficient and competitive this mechanism is (Balkan Green Energy News, 2019)³.

- **For self-consumption**, the rulebook on renewables was adopted in 2019 and is implemented through government-led initiatives under the Ministry of Economy. Self-consumption could further boost installation of decentralised renewable technologies and is an integral part of the NECP and the enhanced NDC.
- **For heating and cooling**, an assessment of specific potential for optimisation of RES is missing. The country has an analysis for mapping of heating demand, which was prepared under the programme for the realisation of the energy strategy. The results point at a potential for development of co-generation and central heating systems in several cities but further assessments would be needed.
- **Phase-out plans** and possible reallocation of fossil fuel subsidies have not yet been announced and detailed. North Macedonia has been decreasing direct subsidies provided to coal/lignite electricity producers, with no fiscal support subsidies and EUR 1.64 million of public finance support subsidies provided in 2019. The average subsidy was EUR 0.64/ MWh, the second-lowest from the EU Energy Community Contracting Parties. Public subsidies were provided in form of a state loan guarantee for modernisation of the Bitola lignite thermal power plant. However, there is no clear indication of whether the government is planning to phase out fossil fuel subsidies completely and by when. In line with the latest governmental statements on phasing out coal/lignite and announcement of the plan to convert the Bitola plant to gas, the country might consider setting a phase-out target and measures to give a clear signal to the investors looking into the sector.
- **Lack of a renewable energy finance framework** that combines public and private sources and allocates the national budget needed.

The available strategic planning documents do not include a detailed view of how financing will be allocated in terms of the shares from private and government sources. Also, information about future levels of government support is lacking.

- **Lack of details on possible government incentives** outside of the current schemes, at least those that are covered in the NECP (i.e. incentives through consumer bills for biomass power plants, subsidies from national and local budget to solar rooftop plants).
- **A standardised European Energy Certificate System** for guarantees of origin is pending, which could open the financing of renewable energy projects in North Macedonia to external investors.

Counterparty risk is related to the risk of default by the off-taker which is, in the case of North Macedonia, the market operator Makedonski Elektroprenosen Sistem Operator (MEPSO), the assigned buyer of renewable power as per the Energy Law of 2018. MEPSO is a government-owned entity and a transmission system operator. The government ownership and operation of a transmission system with relatively stable revenues indicate a low level of counterparty risk. The first auctions for the FiP were held in 2019, and the first contracts were signed in 2020. In some cases, bidders did not ask for a premium on the market price. Instead, they competed for the right to develop projects and sell electricity. MEPSO is obligated to take over the power produced by the producers selected for the FiT, whereas those granted FiP sell their power in the market. By August 2021, no issues had been reported regarding non-payment by MEPSO. Some changes are still ongoing (e.g. implementation of balancing rules) and planned (Transposition of the Regulation on Wholesale Energy Market Integrity and Transparency⁴) in the system though, which could impact MEPSO's financial position. This specific risk, therefore, will require monitoring by renewable energy investors in the future. The overall risk is labelled as medium given

³ *Formal complaint to the Energy Community dispute settlement mechanism on North Macedonia (letter to the Energy Community Secretariat) (CEE Bankwatch Network, 2019).*

⁴ *The Regulation on Wholesale Energy Market Integrity and Transparency (REMIT) defines a framework for identifying and penalising insider trading and market manipulation in wholesale energy markets across Europe. REMIT entered into force in 2011.*

that the new system is still nascent and subject to evolution.

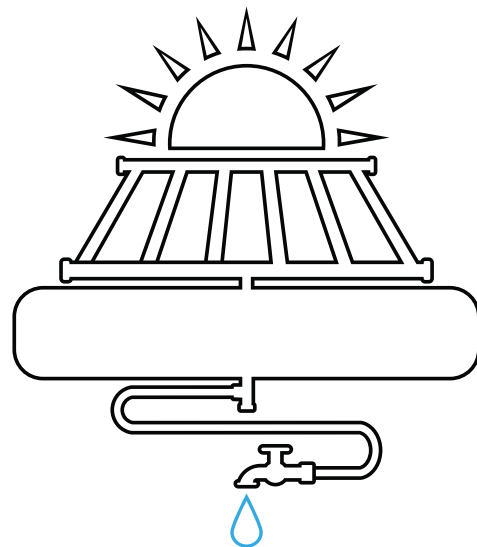
Grid interconnection and transmission line risk lies with the same entity, MEPSO, which is also responsible for the state of the relevant infrastructure. Priority network access and dispatch of renewables is stipulated in the law with a dedicated article, as well as in the grid codes of the electricity transmission system operator (MEPSO) and distribution system operator (EVN). The risk is labelled as medium given that North Macedonia still has a number of actions to take in terms of grid modernisation to accommodate renewable energy. For the future, these actions will include increasing system flexibility to integrate more variable renewable power, continuing the improvement of balancing mechanism implementation, coupling the market with surrounding countries and implementing storage and other demand response options for better grid management.

Resource risk stems from lack of visibility of the future price of renewable sources, including the level of FiT and FiP that will be offered in the market in the coming years. The risk is estimated as medium as government strategies and plans indicate its commitment to developing the renewables sector, yet the exact monetary level of the government support is missing (i.e. projected FiT for the next three years). However, planning documents such as the NECP include projections that help to establish this visibility of the price of electricity, assuming renewable electricity will establish parity or a price level close to that of market-traded electricity. The NECP uses the Hungarian Power Exchange (HUPX) as a reference market in the region, as it is one of the earliest adopted and has the highest level of quantities traded. The wholesale electricity price in North Macedonia follows the price in the HUPX day-ahead market. The NECP projections estimate that the regional electricity price will increase mostly after 2027, after the CO₂ tax is introduced. Given that the current prices are comparatively lower than in the rest of the European Union, such an increase could have a positive impact on enhancing investment attractiveness. However, missing money and cannibalisation effects (IRENA, 2021) could decrease the actual price of electricity.

The resource risk is also dependent on the availability of supply of renewable resources. Increasing information is available for solar irradiation. With increasing use of sustainable biomass, the availability and reliability of its value chain is an issue. For heating and cooling, information is expanding progressively with studies supported by international donors.

With respect to **technology risk**, North Macedonia is facing a shortage of experienced labour and local skills in the market, hence this risk is estimated at medium level. The scenario with additional measures from the NECP requires more than 30% additional green jobs compared with the scenario with existing measures, or BAU scenario (7 000 more, compared with 5 300 in the BAU). The NECP plans for some training and capacity building under the planned policies and measures (e.g. in the measure to “Increase the role of SME sector in energy transition”), though the focus is primarily on energy efficiency, GHG accounting and gender main-streaming.

Although many international donors are providing technical assistance for the preparation of legal and regulatory acts, the limited capacity in the relevant ministries in North Macedonia could present a challenge when it comes to implementation of ambitious strategies and secondary legislation.



Liquidity risk is present in the market and exacerbated by the impacts of the Covid-19 pandemic on the economy, producing mismatches between cash inflows and outflows. The local economy was significantly affected by Covid-19 with industrial production declining by 14.6%, wholesale trade turnover by 33.3% and retail trade by 8.9% (MOEPP, 2021b). This affects in particular SMEs, which are the types of companies active in the renewable energy sector (USAID, 2020). International donors such as EBRD have provided financial support to local banks to weather the liquidity issues (Reiserer, 2020). An indicator that is helpful as a proxy for this evaluation is the recovery rate under the Resolving Insolvency

indicator for the Doing Business Report of the World Bank. North Macedonia has a recovery rate of USD .517 per USD 1 in comparison with the best-performing country, Norway, which has a recovery rate of USD .92 per USD 1. The risk is estimated at medium and its evolution will need to be monitored, especially as the new renewable projects are deployed in the market

Refinancing risk is estimated at medium given that there are a limited number of relevant loans in the market that could be refinanced (if any) and hence there is little visibility on the refinancing dynamic.

4.4 BARRIERS TO SCALING UP INVESTMENTS

Scaling up investments in North Macedonia is a major challenge. The barriers lie with the overall renewable investment market size and the size of the individual deals. Overall the market has been receiving limited investment (USD 340 million during 2005-19 based on BNEF) and the deal size has been on the smaller side given the overall project and market installed capacity (USD 8 million to USD 200 million maximum based on available data. Not all investment data are disclosed). There is an uptake expected in the coming years on the back of the renewable auctions that have taken place and are planned in 2021. So far 35 agreements have been committed, 11 on state-owned land and 24 on privately owned land, amounting to 56 MW of installed capacity. In the wind sector, the deal size could be higher. Based on statements from the Ministry of Economy, investment potential could be EUR 500 million for a 400 MW wind power plant (Todorović, 2020b).

Looking at the investment deals, the **transaction costs** could also present a barrier. Transaction costs are elevated given that both financial and renewable sectors in North Macedonia are developing capability to manage the deal flow in an efficient manner, learning from other developed markets.

To conclude the overview of applicable barriers to renewable energy investment in North Macedonia, **financial-sector regulations** are currently a barrier with high relevance. Financial regulations

such as Solvency II and Basel III restrict insurance companies and banks from investing in risky or illiquid assets. As such, banks and institutional investors could be discouraged from providing long-term lending to renewable energy projects. Changes in the banking sector in North Macedonia are needed in order to extend long-term loans against unsecured project companies with offtake and fuel agreements, which are used for renewable energy projects. In preparation for accession talks with the European Union, North Macedonia can benefit from harmonising its legislation with the EU legislation, including Basel III and Solvency II.

On the positive side, the country has taken several steps to improve conditions, especially for larger foreign investors, that are based on the Law on Strategic Investments of North Macedonia. The law allows potential investors in renewable projects to initiate a large investment cycle in the country. Based on the law, a public call for submission of a request for determining the status of a strategic investment project was announced in May 2020 and extended until 31 January 2022 (Government of the Republic of Northern Macedonia, 2020). Amendments of this law are under preparation reflecting that the Energy Community Secretariat suggested that the Regulation 347/2011/EU is insufficiently transposed in the law, especially with the procedure for starting construction of new energy infrastructure projects.

The above-mentioned barriers are applicable across different types of renewable energy projects. There are specific barriers that apply to heating and cooling specifically:

- **Regulatory barriers:** The heating and cooling sector is faced with insufficiently developed regulations for efficiency appliances, which slows down renewables penetration and potential financing opportunities. Overall, there is lack of compliance enforcement combined with an existing grey market for non-compliant products, further undermining the market development (UNDP, 2020).
- **Investment costs and energy prices:** Upfront investment costs which are required for installation of renewable options both at building/facility and customer level are a barrier. Moreover, interest rates for applicable loans are high in North Macedonia (more than 5%) which increases overall cost of the procurement of new renewables-based options for heating and cooling. Renewables in heating and cooling are affected by low prices

of fossil fuel-based solutions. Moreover, for heating, the wood used to produce the heat is not purchased, i.e. procured for free, making this option particularly financially attractive. The business case for heat pumps has a hard time competing in such a context on a purely monetary basis.

- **Customer awareness and motivation to switch:** Customer awareness of the benefits of cleaner solutions for heating and cooling is still low and requires more government intervention. This is based on a survey of local businesses conducted for a recent assessment of cooling solutions potential in North Macedonia. Moreover, in the absence of legal requirements for replacement, customers lack motivation to proceed with the purchase.

Overall, the above combination of regulatory, cost and awareness barriers adds to the complexity of financing for renewable energy projects in heating and cooling in North Macedonia.



5. Recommendations to address barriers and associated risks holding back investment in renewable energy in North Macedonia

While North Macedonia has been working on developing a more conducive policy and regulatory framework for renewable energy, with notable successes, barriers to investment remain substantial. These barriers prevent, to a certain degree, access to capital for renewable energy projects. Prime Minister Zoran Zaev announced at the beginning of June 2021 a plan for EUR 3.1 billion of government investment to be deployed in the energy sector by 2027 (Todorović, 2021). The plan earmarks the majority of the funding for renewable energy, providing a unique opportunity to build a conducive framework for scaling up renewable energy investment over the long term. The prime minister

also mentioned the intent to create a renewable energy fund.

IRENA's analysis identified specific barriers and associated risks holding back private-sector investment in renewable energy in North Macedonia. The following section outlines recommendations to address them. The opportunity lies with the speedy implementation of specific actions to address project start-up barriers, as well as development and investment risks. In parallel, preparations need to commence for medium- to long-term actions that will target scaling up investments as the renewable energy market in North Macedonia matures.

In the short term, the government needs to focus on the continued implementation of selected policy and regulatory priorities, combined with the development of local capabilities in the financial and renewable energy sectors. Priorities include the provision of government guarantees, especially for larger-scale projects. Additionally, the government should continue raising awareness about the tools and mechanisms available to facilitate renewable energy finance. Collaboration with development finance institutions (DFIs) will be key to encourage public-private partnerships, for example through a dedicated renewable energy fund. The collaboration starts by developing a renewable energy fund which can be used

for the development of finance mechanisms, building sector capabilities and also support for project preparation, in order to leverage the available financial support. This is done by giving grants, technical assistance, and structuring and support to on-lending facilities and risk mitigation instruments.

In the medium to long term, the focus should shift to creating an opportunity to scale up in the market via standardised contracts and bond issuance.

Collaboration between the government of North Macedonia, DFIs, and private and public institutions will be critical to successful implementation of these recommendations.

5.1 IMMEDIATE (SHORT-TERM) FOCUS

The analysis suggests that combined action by the government of North Macedonia and DFIs would contribute to reducing risks related to renewable energy investment. This collaboration would be conducive to attracting first institutional investors in the medium to long term, followed by other private finance players to the market. The expectation is that investors with a larger risk appetite enter the current RES finance landscape first. The following section describes recommendations specifically for the government of North Macedonia (Section 5.1.1) and DFIs and other relevant public institutions (Section 5.1.2).

5.1.1 Recommendations for the government of North Macedonia

The government plays a critical role in creating an enabling environment for investments in renewable energy. This can be done through dedicated policies and regulations in all end uses, and financing mechanisms such as government guarantees for projects, the creation of a renewable energy fund and lending options to disburse the renewable fund resources.

Create an enabling environment for investments in the power sector

Continue developing a policy and regulatory framework to increase investments in renewable power, including:

- **Introduce capacity or budget caps** on renewables capacity that can benefit from the FiT and FiP support mechanisms per technology, and review and plan for the medium- to long-term evolution of caps for specific renewable energy technologies. Communicating these plans early increases transparency and reduces risk for investors. (Covered by Policies and Measures item [PAM] number 3 Incentives feed-in tariff and PAM 4 Incentives feed-in premium in Enhanced NDC submission by the Republic of North Macedonia)
- **Support renewable electricity self-consumption:** Update the already existing rulebook based on lessons learned so far and reactions from the stakeholders using the guidelines from the Energy Community (Energy Community, 2018). This should include creation of a country-wide register of self-consumption renewable power installations. (PAM 6 Solar rooftop power plants)
- **Explore the opportunity** to introduce demand response programmes as a complementary initiative to on-site power generation by consumers. (PAM 58 Price signal demand response)

- **Finalise a standardised European Energy Certificate System** for guarantees of origin of electricity from North Macedonia to enable participation of foreign market players and investors. (PAM 7 RES without incentives)
- **Pursue the planned changes in the power system** such as the implementation of balancing rules, REMIT transposition, connecting the market with surrounding countries, and implementing storage and other demand response options. (PAM 1 Reduction of network losses; PAM 58 Price signal demand response)
- **Raise awareness** about the potential and benefits of renewable heating and cooling among customers and stakeholders in the supply chain, such as decreased energy costs where applicable and improved indoor air quality. (PAM 13 Public awareness campaigns and network of energy efficiency [EE] info centers)
- **Pursue the development of district heating systems**, prioritising renewable options (combining several technologies such as solar and geothermal together with heat storage and excess heat from industrial processes) in selected cities, with a view to integrating low-temperature renewables (IRENA and AAU, 2021). (PAM 23 Increased use of central heating systems) This should include:

Create an enabling environment for investments in heating and cooling

Continue developing a policy and regulatory framework to increase investment opportunities for renewables and improved energy efficiency in heating and cooling,⁵ including:

- **Develop regulations** for efficient appliances for heating and cooling (air-conditioning equipment, heaters, etc.) and develop a system to enforce compliance (e.g. via on-site inspection, penalty mechanisms for distributors of appliances and equipment not complying with standards and labelling requirements). (PAM 10 Solar thermal collectors; PAM 11 Labelling of electric appliances and equipment)
- **Consider introducing legal requirements** for the replacement of fossil fuel-based and non-efficient equipment. This could require providing financing support. (PAM 14 Retrofitting of existing residential buildings; PAM 15 Retrofitting of existing central government buildings; PAM 16 Retrofitting of existing local self-government buildings; PAM 17 Retrofitting of existing commercial buildings)
- **Identify financing mechanisms** for the installation of renewable heating and cooling options in buildings and industry to reduce the upfront cost of investment. These could include reduced interest rates and grants and especially energy-poor households as final beneficiaries. (PAM 14 Retrofitting of existing residential buildings; PAM 15 Retrofitting of existing central government buildings; PAM 16 Retrofitting of existing local self-government buildings; PAM 17 Retrofitting of existing commercial buildings)
- **To attract investment in needed district energy infrastructure** (PAM 23 Increased use of central heating systems), recommendations include:⁶
 - developing strategic plans for heating and cooling building on clear political drivers and identifying the stakeholders that need to be engaged in the transition
 - elaborating on technical scenarios based on analysis of heating and cooling demand, in addition to mapping low-temperature renewable energy resources
 - ensuring the presence of an enabling regulatory framework and the establishment of conducive financing options and business models.
 - ensuring sufficient anchor load that would sustain the newly developed district heating and cooling infrastructure and ensure investments in new infrastructure are profitable. Considerable anchor loads can be guaranteed through large consumers of heat such as industries and public buildings.
 - mandating connections to district heating and cooling networks or renewable gas grids in new urban developments, public buildings and other opportune locations based on the Law on Energy. Mandates would ensure a stable demand for the network and reduce investment risk. Enforce connections to renewable gas grids or district heating and cooling networks in public buildings, new developments in urban areas, and other

⁵ IRENA has published a joint report with IEA and REN21 on *Renewable Energy Policies in a Time of Transition that details the policies needed for the transition of heating and cooling through electrification, green gases, sustainable bioenergy, the direct use of solar and geothermal heat, and the development of enabling infrastructure such as district heating and cooling.*

⁶ These recommendations, among others to support district heating and cooling, can be found in the joint report with IEA and REN21 on *Renewable Energy Policies in a Time of Transition.*

locations based on the Law on Energy. Such mandates could ensure a long-term and stable demand for heat and reduce investment risk.

- ensuring that energy efficiency plans, goals and measures are accounted for when analysing the feasibility of district heating networks and other heating and cooling infrastructure.

Consider cross-cutting policies to create an enabling environment for the energy transition

Continue developing a regulatory framework and fiscal system that facilitates the adoption of energy transition solutions while discouraging investments in fossil fuel technologies and supporting a phase-out aligned with climate goals, including:

- Provide details of government support for the NECP including indications of specific monetary amounts and timeline for their disbursement. (In all measures pertaining to renewables)
- Identify a pathway for reallocation of subsidies currently provided to coal- and petroleum-based products towards renewable energy options using insights from a study conducted by the Energy Community (Energy Community, 2019) (PAM 3 Incentives feed-in tariff and PAM 4 Incentives feed-in premium)

Provide government guarantees for renewable energy projects

North Macedonia could improve the risk profile of its renewable energy project portfolio via issuance of government guarantees for selected large-scale projects from the treasury or Ministry of Finance. This is particularly relevant for projects without DFI participation. Projects financed by a renewable energy fund, based on the announcement of the prime minister, could receive a government guarantee based on a formalised review process, reducing risk and financing costs. If the provision of a government guarantee is not possible, other options could be explored such as a national bank guarantee. A corporate guarantee fund or trust with a high credit-risk rating or other similar indicator is also possible and entails more complexity in terms of its preparation and implementation. (PAM 7 RES without incentives)

Create a dedicated renewable energy fund

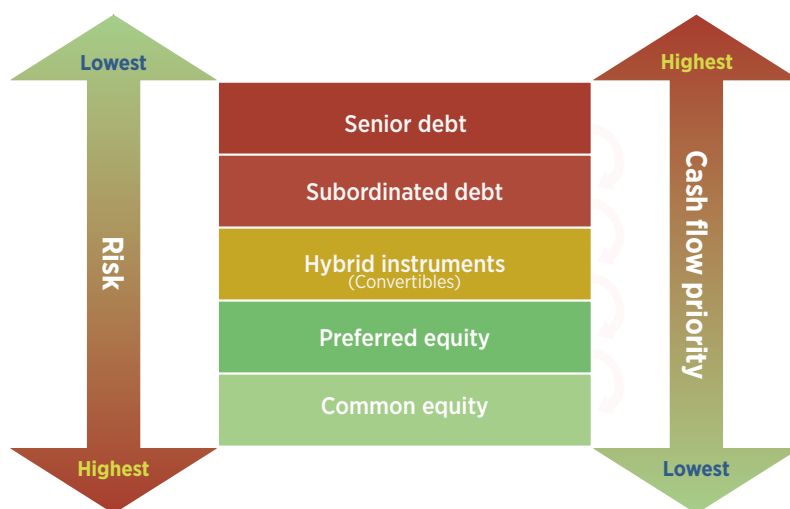
North Macedonia could leverage capital market solutions for enhancing access to capital for renewable energy projects while building

bankable project pipelines and local capabilities. The creation of a dedicated renewable energy fund can help achieve these objectives. (PAM 3 Incentives feed-in tariff, PAM 4 Incentives feed-in premium, PAM 5 Biomass power plants, PAM 7 RES without incentives and other measures with relevance for renewables as applicable)

The following are some of the considerations for a design of a local renewable energy fund:

- **Offering a platform for engaging DFIs and institutional investors:** Both are important for growing renewable finance in North Macedonia and in some instances more likely to invest in a fund rather than individual projects, especially institutional investors.
- **Supporting project preparation and facilitation:** The fund should pool resources (from government budget and DFIs) to offer technical assistance and grants either directly at the project level (e.g. for feasibility studies) or at the market level (e.g. to detail the potential for renewables in heating and cooling, to forecast local market and pricing developments).
- **Streamlining institutional procedures:** There is considerable potential for streamlining institutional procedures for accessing financial instruments and risk mitigation mechanisms, thus increasing private-sector capital. Actions include the introduction of measures to help project developers evaluate the suitability of risk mitigation instruments for their projects.
- **Facilitating access to capital:** The fund could create a local infrastructure for renewable energy lending with the involvement of local banks using debt and hybrid instruments (see an overview in Figure 9) to improve local lending capacity, access to capital and risk-adjusted returns for renewable energy investment.
- **Initiating finance policies** adapted to the needs of the market: Finance policies can develop funding mechanisms to enable financing or introduce guidelines and regulations for capital markets to increase deal flow liquidity and funding supply. Examples include differentiated interest rates, priority sector lending, a funding mechanism dedicated to renewables, and guidelines for green bonds issuance.

Figure 9. Overview of capital stack for debt and hybrid instruments



- **Building capacity for stakeholders** in the renewable and financial sectors in the country: Take specific measures to support education and training on financing renewable energy projects and on technology-related topics related to the deployment of renewables. For instance, on-lending facilities need dedicated staff in banks who are able to capture market opportunities and analyse the attractiveness of renewable energy investments. Capacity building for banks can include training on technical aspects of project evaluation and identification, facility eligibility criteria, and case studies.

Consider lending options to disburse the renewable fund resources

North Macedonia should explore different avenues to disburse finance from the future renewable energy fund. These should leverage the contribution by DFIs and contribute to de-risking of the project pipeline. (PAM 3 Incentives feed-in tariff, PAM 4 Incentives feed-in premium, PAM 5 Biomass power plants, PAM 7 RES without incentives and other measures with relevance for renewables as applicable)

The available options should include:

- **Creation of on-lending facilities** where DFIs utilise their market access and high credit quality to borrow debt at low rates and on-lend them via credit lines to government or other institutions (see a sample structure model in Figure 10). Besides reducing the risk for local lenders and the cost of financing, on-lending structures also facilitate access for local financial institutions to consultancy services and training to develop bankable renewable energy projects, thus building capacity and a track record. This mechanism is already in place via EBRD's green credit lines and could be boosted via the renewable energy fund.
- **Loan syndication**, which entails DFIs co-lending senior debt with commercial banks and distributing the risk among a broader group of lenders, thereby limiting each bank's risk-taking. The added advantage is the fact that local institutions can use loan syndication with DFIs and as a learning opportunity.
- **Subordinated debt** that can help to insulate senior debt investors from unacceptable risk and reduce the cost of capital. Subordinated debt can be provided by public investors (DFIs) to attract private investors.
- **Convertible grants and loans**, which provide an opportunity to shift funding between different forms (from grants to loans, from loans to other instruments or equity). They are particularly useful for early-stage projects because they mitigate risks while allowing for potential upside return for lenders.

In pursuing the above actions, the government of North Macedonia could leverage the contribution of DFIs and interested institutional investors.

5.1.2 Recommendations for DFIs and institutional investors

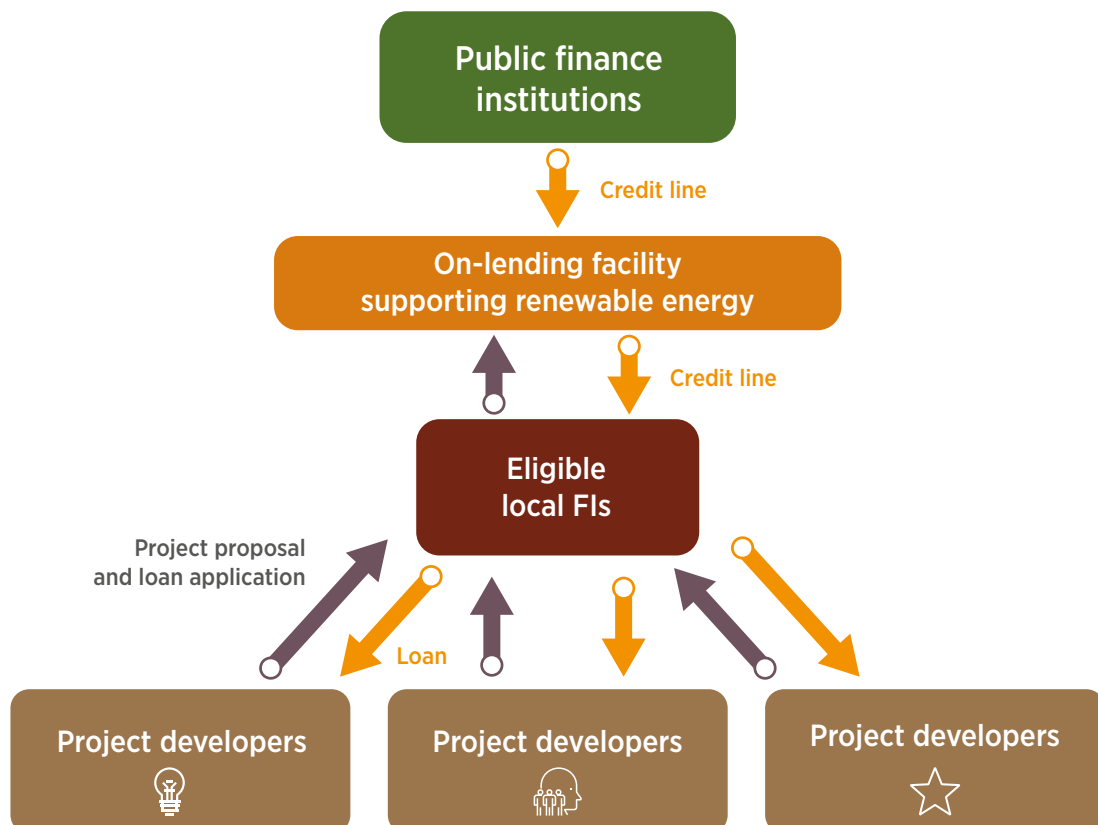
DFIs have been central to the development of the renewable energy market in Southeast Europe, including North Macedonia. With public finance dominating the renewables market, DFIs can influence market development and its scaling. Additionally, institutional investors are more likely to participate on the back of DFI's market engagement. This analysis has identified several participation possibilities for DFIs, institutional investors and other relevant international organisations as follows:

Support development of capabilities in the renewable sector, including finance

DFIs can support the development of capabilities in the financial sector and across the renewable energy value chain. For the financial sector and local financial institutions, specialised training for staff can help develop local expertise in renewable energy finance. Through their technical assistance and grants DFIs can offer support to project preparation and facilitation so that projects advance from initiation to full investment

maturity. This should include on-the-job training for preparing feasibility studies or project proposals for project sponsors applying for loans. Other possible avenues include offering assistance via business incubators and project facilitation support building on global tools such as the Climate Investment Platform (CIP), established by IRENA, the UNDP and Sustainable Energy for All (SE4ALL) in collaboration with the Green Climate Fund (GCF) (www.irena.org/irenaforcip). The CIP provides a mechanism to bring together projects and investors. Project facilitation support may include mapping of the active project pipeline by technology and location to increase transparency in the market. (PAM 13 Public awareness campaigns and network of energy efficiency [EE] info centers)

Figure 10. On-lending structure model



Note: FIs = finance institutions.

Support design and planning for on-lending facilities under a renewable energy fund

DFIs will need to support the development of on-lending facilities based on the financing needs of renewable energy investments. Planning and designing suitable on-lending facilities require a good understanding of the local financing capacity, the appropriate enabling policies in place and other planned government actions. On-lending facilities should offer different loan sizes and tenors, suitable for different renewable energy technologies and scales that align with the country's renewable energy strategy (PAM 3 Incentives feed-in tariff, PAM 4 Incentives feed-in premium, PAM 5 Biomass power plants, PAM 7 RES without incentives and other measures with relevance for renewables as applicable).

Support the design and implementation of risk mitigation instruments

Risk mitigation instruments will be important for the development of the renewable energy market in North Macedonia. This analysis recommends the introduction of government guarantees to reduce investor risk. Other risk mitigation tools should include the creation of liquidity facilities to provide short-term cash flow to a project or company or to extend the time

to improve a project's liquidity profile. As the development of specific technologies advances in North Macedonia, risk mitigation would be required to cover resource risks, for example for geothermal and biomass energy projects. (PAM 3 Incentives feed-in tariff, PAM 4 Incentives feed-in premium, PAM 5 Biomass power plants, PAM 7 RES without incentives and other measures with relevance for renewables as applicable)

Communicate and raise awareness about opportunities of renewable energy finance

DFIs can increase the awareness about the available resources and ease the access capital among market participants. This can be conducted directly through their own channels and in collaboration with the government and its ongoing and planned initiatives. Direct marketing materials should be channelled under the framework of a renewable energy fund. (PAM 13 Public awareness campaigns and network of energy efficiency [EE] info centers)

Overall, there is a unique opportunity to optimise the involvement of DFIs in North Macedonia's renewable energy market on the back of the government's energy and climate strategy. This collaboration would benefit local and international players and project deployment.

5.2 MEDIUM- TO LONG-TERM FOCUS

In the medium term, the focus should shift from building initial access to capital to scaling renewable energy projects. In order to achieve larger-scale investments, barriers to be addressed include high transaction costs, investment size and overall market liquidity, which can be tackled with structured finance mechanisms and capital market tools. The recommended actions pertain to three areas, including standardised contracts, aggregation and improved financial sector regulations.

5.2.1 Standardised contracts

To attract capital at scale, the cost of developing and financing projects in North Macedonia needs to be reduced. This requires lower due diligence costs. Structured finance mechanisms can contribute to making the transaction costs lower. In a structured finance transaction, project assets generating the cash flow are

isolated from the sponsor and accompanied by standardised project documentation and, where applicable, aggregation of assets. Standardised project documentation entails standardised tendering, contracting and due diligence processes. The North Macedonian government can play a leading role in standardising the renewable energy power contracting process and even develop a country-wide template for a specific renewable energy technology. Alternatively, DFIs can play a role in leading the process and convening the relevant stakeholders. DFIs and some banking institutions already have pre-existing templates that have been tested and can simplify the preparation process.

Standardised contracts can be employed to establish ownership structures, servicer requirements or power purchase agreements (PPAs), to name a few uses. Establishing common features for PPAs is thus a starting point for standardising contracts. Standardised features of renewable energy PPAs typically deal with five areas. These include i) energy purchase requirements and rates; ii) grid interconnection and transmission responsibilities; iii) agreement assignment or termination; iv) adverse regulatory or tax changes; and v) dispute resolution and force majeure. For solar PV projects specifically, IRENA and the Terrawatt Initiative have launched the Open Solar Contracts initiative aimed at streamlining project development and finance processes by offering simple, standardised and universally applicable legal agreements. The standardised contracts developed under this initiative are freely available online and their use can significantly decrease transaction costs, shorten project development timelines and facilitate balanced risk allocation. (PAM 3 Incentives feed-in tariff, PAM 4 Incentives feed-in premium, PAM 5 Biomass power plants, PAM 7 RES without incentives and other measures with relevance for renewables as applicable)

5.2.2 Aggregation

Smaller projects are more costly to finance, along with projects at the level of SMEs and consumers/prosumers. This is due to the fact that due diligence and the associated transaction costs are fixed for projects of all sizes. Aggregating several smaller renewable energy assets can address this challenge and reduce costs per project and widen the pool of finance providers. Building an aggregation model requires commitment from the government and specific terms of standardisation to be implemented by the industry stakeholders. The International Finance Corporation, for example, has already implemented this approach to seven solar PV projects in Jordan (IFC, n.d.). (PAM 3 Incentives feed-in tariff, PAM 4 Incentives feed-in premium, PAM 5 Biomass power plants, PAM 7 RES without incentives and other measures with relevance for renewables as applicable)

5.2.3 Green bond issuance

Green bonds finance assets are placed in a trust or special purpose vehicle to insulate investors from the developer as a way to reduce investor risk. Bond financing tends to be difficult for pre-construction and construction stages. Therefore, it offers an interesting option for refinancing for already-operating renewable energy assets and asset pools. Green bonds can be especially effective in attracting institutional investors into the renewable energy sector as they eliminate early-stage project risks and offer suitable transaction size, liquidity and credit assurance if bonds are rated and listed on an exchange. The government may decide to issue policy guidelines for bond issuance with standards for review, reporting and tracking. DFIs can structure project bonds with credit enhancements and improve the credit profile of renewable energy projects. (PAM 3 Incentives feed-in tariff, PAM 4 Incentives feed-in premium, PAM 5 Biomass power plants, PAM 7 RES without incentives and other measures with relevance for renewables as applicable)

5.2.4 Financial sector regulations

Financial regulations such as Basel III and Solvency II restrain banks and insurance companies from investing in illiquid or risky assets. Institutional investors and banks may therefore be discouraged from providing long-term lending to renewable energy projects. Changes in the banking sector in North Macedonia are needed in order to extend long-term loans against unsecured project companies with offtake and fuel agreements, which are used for renewable energy projects.

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