



Republic of North Macedonia

Ministry of Environment  
and Physical Planning



# ENHANCED NATIONALLY DETERMINED CONTRIBUTION

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Submission by the Republic of North Macedonia



# Contents:

<b>INTRODUCTION</b>	02
<b>ENHANCEMENT COMPONENTS</b>	02
<i>Mitigation ambition</i>	04
<i>Implementation</i>	05
<i>Communication</i>	06
<b>ACCOMPANYING INFORMATION</b>	07
1. <i>Quantifiable information on the reference point</i>	07
2. <i>Time frames and/or periods for implementation</i>	08
3. <i>Scope and Coverage</i>	08
4. <i>Planning Processes</i>	09
5. <i>Assumptions and methodological approaches, including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals</i>	14
6. <i>How the Party considers that its nationally determined contribution is fair and ambitious in the light of its national circumstances</i>	17
7. <i>How the nationally determined contribution contributes towards achieving the objective of the Convention as set out in its Article 2</i>	18
<b>ADDITIONAL ACTIVITIES</b>	19
<i>Economic and environmental evaluation of the Policy and Measures</i>	19
<i>Social aspects of the Policy and Measures</i>	20
<i>The role of the private sector</i>	21
<i>SDGs - enhanced NDC synergies and trade-offs</i>	21
<i>Circular Economy</i>	22
<b>FOLLOW UP ACTIVITIES</b>	23
<i>Covid-19 related revisions</i>	23
<i>"Climate promise" ongoing/planned activities</i>	23
<i>Adaptation</i>	24

# Introduction

01

The Republic of North Macedonia, a non-Annex I party to the United Nations Framework Convention on Climate Change (UNFCCC), ratified Paris Agreement in November 2017, with the following nationally determined contribution (NDC) to the global efforts for GHG emissions reduction (initial NDC, submitted 2015): "To reduce the CO<sub>2</sub> emissions from fossil fuels combustion for 30%, that is, for 36% at a higher level of ambition, by 2030 compared to the business as usual (BAU) scenario." The focus of the initial NDC is put on climate change mitigation, and particularly to CO<sub>2</sub> emissions from fossil fuels combustion which covers almost 80% of the total GHG emissions in the country. The following sectors are of dominant share: energy supply, buildings and transport.

02

The Republic of North Macedonia is a candidate country for European Union (EU) membership, and as a Western Balkan Contracting Parity of Energy Community, **committed to work towards the 2050 climate neutrality target** – the heart of the European Green Deal, like the rest of the EU in the frame of the Energy Community.

03

The first round of NDCs, if fully implemented, would lead to warming of 2.9 degrees C to 3.4 degrees C over the course of the century. Enhanced mitigation ambition is therefore essential to achieving the Paris Agreement's goal to limit warming to well below 2 degrees C, or 1.5 degrees C. The Agreement set up a mechanism to enhance ambition for climate action over time, requiring each country to prepare and communicate NDC every five years to reflect its highest possible ambition.

## Enhanced Nationally Determined Contribution

04

In response of the COP decision at Paris, reiterated by 2018 decision at COP24 in Katowice, and in line with the Decision of the Government from its 65th session held on April 13th 2021, **the Republic of North Macedonia communicates the following enhanced nationally determined contribution to the global efforts for GHG emissions reduction:**

**In 2030, 51% reduction in greenhouse gas emissions compared to 1990 levels.**

**Expressed in net<sup>2</sup> emissions, in 2030, 82% reduction compared to 1990 levels.**

The enhanced NDC is focused on mitigation area, with a vision to include adaptation component in the subsequent submissions, once the relevant national strategic and planning documents are prepared and adopted.

05

The main components of NDC enhancement<sup>1</sup> are realized in the following areas: Mitigation ambition, Implementation and Communication

<sup>1</sup> The enhancement components are provided taking reference from WRI and UNDP guidance (Enhancing NDCs: A Guide to Strengthening National Climate Plans by 2020)

<sup>2</sup> **The projected sinks in 2030, that are assumed to be realized with the implementation of the planned measures are only 7% higher than the sinks in 2014**



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Enhancement components	Enhanced NDC (2021)	Initial NDC (2015)
<b>Mitigation ambition</b>		
<b>Strengthen the GHG target</b>	<ul style="list-style-type: none"> <li>- End-year type of target (2030 emissions level compared to 1990 emissions level)</li> <li>- Compatibility and comparability with EU target</li> <li>- Absolute emission reduction in 2030 compared to BAU: 7,603 Gg CO<sub>2</sub>-eq</li> </ul>	<ul style="list-style-type: none"> <li>- Deviation from BAU type of target in 2030</li> <li>- Absolute emission reduction in 2030 compared to BAU: 5,228 Gg CO<sub>2</sub>-eq</li> </ul>
<b>Strengthen or add policies and actions:</b>	<ul style="list-style-type: none"> <li>- 63 mitigation policies and measures (PAMs) in the following sectors: <ul style="list-style-type: none"> <li>✓ Energy (incl: Energy Supply, Residential and Non-specified, Industry, Transport)</li> <li>✓ Agriculture,</li> <li>✓ Land Use, Land Use Change and Forestry (LULUCF)</li> <li>✓ Waste</li> <li>✓ Additional PAMs (enablers of mitigation action)</li> </ul> </li> <li>- Emissions coverage: Economy-wide target</li> <li>- GHGs covered: CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O</li> </ul>	<ul style="list-style-type: none"> <li>- 17(+9 in higher ambition scenario) mitigation PAMs in the following sectors: <ul style="list-style-type: none"> <li>✓ Energy supply</li> <li>✓ Buildings</li> <li>✓ Transport</li> </ul> </li> <li>- Emissions coverage: Emissions from fossil fuel combustion</li> <li>- GHGs covered: CO<sub>2</sub></li> </ul>
<b>Strengthen or add a sectoral non-GHG target:</b>	<p>The enhanced NDC is coherent with the following sectoral non-GHG targets in 2030 stipulated in the draft National Energy and Climate Plan (NECP):</p> <ul style="list-style-type: none"> <li>- <b>Renewable Energy Sources (RES)</b> <ul style="list-style-type: none"> <li>✓ 38% share in gross final energy consumption</li> <li>✓ 66% share in gross electricity production</li> <li>✓ 45% share in gross final energy consumption for heating and cooling</li> <li>✓ 10% in final energy consumption in transport</li> </ul> </li> <li>- <b>Energy Efficiency (EE)</b> <ul style="list-style-type: none"> <li>✓ 20.8% savings of final energy consumption relative to BAU scenario</li> <li>✓ 34.5% savings of primary energy consumption relative to BAU scenario</li> </ul> </li> </ul>	

<p><b>Align implementation of the existing NDC with long term goals:</b></p>	<p>The enhanced NDC echoes the Green scenario from the National Strategy for Energy Development up to 2040 and is fully aligned with the draft National Energy and Climate Plan (NECP). It is consistent with the following long term (2040) goals:</p> <ul style="list-style-type: none"> <li>- % reduction of GHG emissions vs. 2005: 61.5</li> <li>- % of RES in gross final energy consumption: 45</li> <li>- % reduction of primary and final energy consumption vs. BAU: 51.8 primary, 27.5 final</li> </ul> <p>The enhanced NDC is strongly linked to the EU-funded "Law and Strategy on Climate Change" project, which will deliver the Long-Term Climate Action Strategy and the Law on Climate Action.</p> <p>Furthermore, the enhanced NDC addresses the regional aspect contributing significantly to all five priority measures identified in the energy sector of the draft Strategy for Regional Development 2019-2029.</p>	<p>No relation to long term goals. In order to identify specific mitigation PAMs, the following documents have been taken into consideration:</p> <ul style="list-style-type: none"> <li>- Energy Strategy</li> <li>- Energy Efficiency Strategy</li> <li>- Strategy on Renewable Energy Sources</li> <li>- The Program for Implementation of the Energy Strategy</li> <li>- Energy Efficiency Action Plan</li> <li>- Action Plan on Renewable Energy Sources</li> <li>- Transport Sector Strategy</li> <li>- Pre-accession Economic Program</li> <li>- Program of the Government of the Republic of Macedonia</li> <li>- The Third National Communication on Climate Change</li> <li>- First Biennial Update Report on Climate Change</li> </ul>
<p><b>Implementation</b></p>		
<p><b>Add actions or measures to strengthen implementation:</b></p>	<ul style="list-style-type: none"> <li>- The enhanced NDC encompasses mitigation action enabling PAMs like carbon pricing, pursuing regional energy markets integration, strengthening the role of SME, PAMs in the area of research and innovation and other measures.</li> <li>- For each PAM, the finances needed are specified, as well as the potential sources of finances.</li> <li>- For each PAM, the implementing and the monitoring entities/institutions are identified.</li> <li>- For each PAM, progress indicators to monitor implementation with reference values (in the reporting year and in the target year) are clearly stated.</li> <li>- For each PAM, information of the direct and indirect contributions on the Sustainable Development Goals (SDGs) is included.</li> </ul>	<ul style="list-style-type: none"> <li>- PAMs are presented in less detail</li> </ul>



## Communication

<b>Provide basic information to enhance clarity, transparency &amp; understanding:</b>	<ul style="list-style-type: none"> <li>- PAMs are presented in a tabular format with sufficient level of detail.</li> <li>- The conducted analyses and PAMs tables are included in the enhanced NDC Background document which is an integral part of the enhanced NDC submission. The other supportive documents and studies will be published at <a href="https://www.klimatskipromeni.mk/">https://www.klimatskipromeni.mk/</a></li> </ul>	<ul style="list-style-type: none"> <li>- PAMs are presented in Tabular format.</li> <li>- The conducted analyses and PAMs tables are included in the NDC Background document which is an integral part of the NDC submission.</li> </ul>
<b>Provide additional detail</b>	<ul style="list-style-type: none"> <li>- Economic and environmental evaluation of PAMs is conducted applying Marginal Abatement Cost <b>(MAC) Curve</b> tool</li> <li>- Social aspects of the PAMs are addressed by calculation of the <b>newly created jobs</b>, introduction of the <b>gender indicators</b> in some of the PAMs with an aim to make them gender-responsive, as well as by organization of a virtual <b>youth consultation</b> on the enhanced NDC, designed to ensure that the voices of young people are expressed in the NDC, that there will be broad ownership for the enhanced NDC goals and that baseline communication channels are established to ensure proper youth engagement in pursuing NDC goals.</li> <li>- <b>The role of the private sector</b> in the mitigation action is particularly analyzed through consideration of additional PAMs in the Industry sector</li> <li>- <b>SDGs-enhanced NDC synergies and trade-offs</b> are identified and quantified in order to understand the contribution of the enhanced NDC to the national SD agenda.</li> <li>- The benefits of <b>Circular Economy</b> on GHG emission reduction are analyzed with an aim to identify opportunities and challenges for the mitigation through advancing circular practices in the waste management sector, in line with the European Green Deal and the EU Action Plan on Circular Economy.</li> <li>- The <b>contributions to regional development</b> are credibly demonstrated as the five priority measures in the energy sector from the draft Strategy for Regional Development 2019 - 2029 are adequately linked to relevant PAMs from the enhanced NDC.</li> </ul>	<ul style="list-style-type: none"> <li>- Economic and environmental evaluation of PAMs is conducted applying MAC Curve tool.</li> <li>- Social aspects of the PAMs are addressed by calculation of the newly created jobs.</li> </ul>

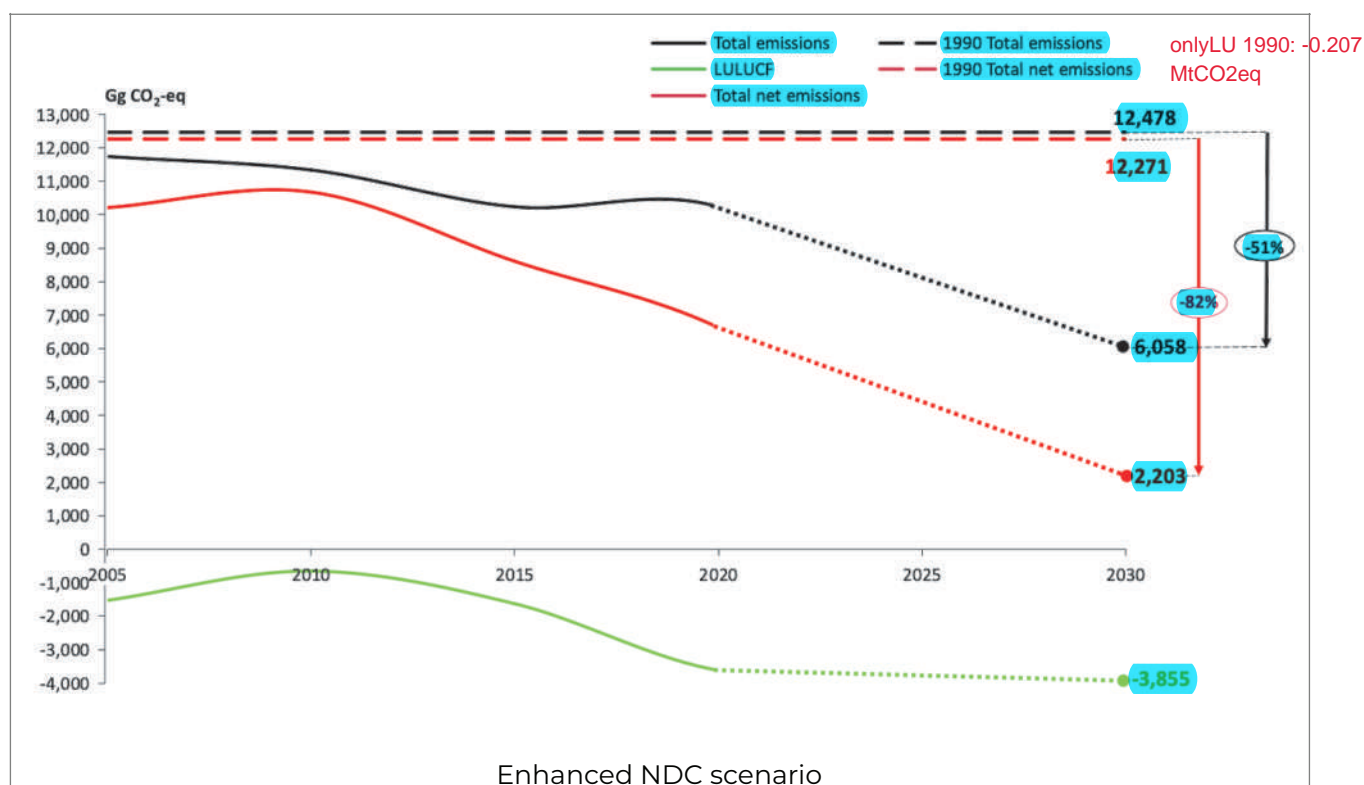
# ENHANCED NATIONALLY DETERMINED CONTRIBUTION OF THE REPUBLIC OF NORTH MACEDONIA (enhanced NDC)

## ACCOMPANYING INFORMATION

### 1. Quantifiable information on the reference point

a)	Reference year(s), base year(s), reference period(s) or other starting point(s);	Base year: 1990
b)	Quantifiable information on the reference indicators, their values in the reference year(s), base year(s), reference period(s) or other starting point(s), and, as applicable, in the target year;	<p>The reference indicator - national greenhouse gas (GHG) emissions in the base year 1990 is quantified based on the National Inventory Report (NIR).</p> <p>The base year emission level: 12,478 Gg CO<sub>2</sub>-eq.</p> <p>Target year: 2030</p> <p>The target year emission level: 6,058 Gg CO<sub>2</sub>-eq.</p>
c)	For strategies, plans and actions referred to in Article 4, paragraph 6, of the Paris Agreement, or policies and measures as components of nationally determined contributions where paragraph 1(b) above is not applicable, Parties to provide other relevant information;	
Not applicable		
d)	Target relative to the reference indicator, expressed numerically, for example in percentage or amount of reduction;	<p><b>In 2030, 51% reduction in GHG emissions compared to 1990 levels</b> (black line on the graph below).</p> <p>Disaggregated by sector (2030 vs.1990)</p> <ul style="list-style-type: none"> <li>• Energy: 66% reduction (mainly through decommissioning of coal-fired power plants Oslomej in 2021 and Bitola up to 2027)</li> <li>• IPPU: 45% increase</li> <li>• Agriculture: 29% reduction</li> <li>• LULUCF: 95% removals increase</li> <li>• Waste: 21% reduction</li> </ul> <p>resulting in</p> <p><b>In 2030, 82% reduction in net GHG emissions compared to 1990 levels</b> (red line on the graph below)</p> <p>The calculated figures refer to the emissions and sinks generated at the territory of the Republic of North Macedonia (the emissions related to imported electricity are taken to be zero).</p>





e)	Information on sources of data used in quantifying the reference point:	The reference indicator will be quantified based on national total GHG emissions in 1990 reported in the NIR.
f)	Information on the circumstances under which the Party may update the values of the reference indicators:	The national total GHG emissions in 1990 may be updated and recalculated due to continuous methodological improvements. Information on updates made will be included in the Biennial Transparency Report.

## 2. Time frames and/or periods for implementation

a)	Time frame and period of implementation:	14 April 2021 to 31 December 2030.
b)	Whether it is a single-year or multi-year target, as applicable:	Single-year target in 2030.

## 3. Scope and Coverage

a)	General description of the target:	Economy-wide, emission reduction of 51% in 2030 compared to base year emissions.
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b)	Sectors, gases, categories and pools covered by the nationally determined contribution, including, as applicable, consistent with Intergovernmental Panel on Climate Change (IPCC) guidelines;	<p>The target covers emissions from the following sectors:</p> <ul style="list-style-type: none"> <li>• Energy</li> <li>• Industrial Processes and Product Use</li> <li>• Agriculture</li> <li>• Waste</li> </ul> <p>The target covers the following gases: Carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O)</p> <p>For the land-use, land-use change and forestry sector emissions and removals, the following reporting categories are included: forest land, cropland, grassland, and wetland, including land use changes between the categories, and between these categories and settlements and other land. The five carbon pools above-ground biomass, below-ground biomass, litter, dead wood and soil organic matters are included using default emission factors are used.</p>
d)	How the Party has taken into consideration paragraphs 31 (c) and (d) of decision 1/CP.21	All sectors from the IPCC 2006 methodology are included and will continue to be included.
e)	Mitigation co-benefits resulting from Parties' adaptation actions and/or economic diversification plans, including description of specific projects, measures and initiatives of Parties' adaptation actions and/or economic diversification plans.	

Not applicable

#### 4. Planning Processes

a)	Information on the planning processes that the Party undertook to prepare its nationally determined contribution and implementation plans, including: domestic institutional arrangements, public participation and engagement with local communities and indigenous peoples, in a gender-responsive manner	<p>The Republic of North Macedonia signed (2015) and ratified (2017) the Paris Agreement, under which it became the twenty-third country in the world that submitted its NDC (2015). Since then, a number of planning and technical documents in the field of Energy and Climate Change were adopted or are in preparation.</p> <ul style="list-style-type: none"> <li>• Second Biennial Update Report – SBUR (2018),</li> <li>• Strategy for Energy Development up to 2040 (2019),</li> <li>• Third Biennial Update Report – TBUR (draft 2020),</li> <li>• National Energy and Climate Plan – NECP (draft 2020),</li> <li>• Long Term Strategy on Climate Action (draft 2020),</li> <li>• Strategy for Regional Development 2019-2029 (draft 2020, in Parliamentary adoption procedure).</li> </ul> <p>All of them, with the processes established, have served as entry points to the enhanced NDC.</p>
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<p>(i) Domestic institutional arrangements, public participation and engagement with local communities and indigenous peoples, in a gender-responsive manner;</p>	<p>The enhanced NDC was established through broad participatory process including stakeholders from:</p> <ul style="list-style-type: none"> <li>• Government institutions and inter-institutional bodies, state agencies and authorities: <ul style="list-style-type: none"> <li>✓ Ministry of Environment and Physical Planning (with the UNFCCC Focal Point),</li> <li>✓ Ministry of Economy, (Departments on Energy and Industry)</li> <li>✓ Cabinet of Vice-prime Minister in Charge for Economic Affairs,</li> <li>✓ Secretariat for European Affairs,</li> <li>✓ Ministry of Labour and Social Policy (with the UNFCCC Gender and Climate Change Focal Point)</li> <li>✓ Ministry of Agriculture, Forestry and Water Supply (from Departments in charge on Agriculture, Forestry and Water Supply),</li> <li>✓ Ministry of Transport and Communications</li> <li>✓ Ministry of Education and Science</li> <li>✓ State Statistical Office</li> <li>✓ Energy Agency</li> </ul> </li> <li>• Societal stakeholders: <ul style="list-style-type: none"> <li>✓ Industries and businesses and their associations (Chambers of Commerce)</li> <li>✓ Fund for Innovations and Technology Development</li> <li>✓ Environmental NGOs.</li> <li>✓ Formal and informal youth-led environmental groups</li> </ul> </li> <li>• Local governance stakeholders: <ul style="list-style-type: none"> <li>✓ City of Skopje</li> <li>✓ Association of the Units of Local Self-Government (ZELS)</li> </ul> </li> <li>• Academic institutions</li> <li>• International organizations and donors and international and national financing institutions and trust funds.</li> </ul> <p>The country counts with extensive national expertise for reporting towards the UNFCCC (GHG inventory preparation, mitigation modelling and emissions projections) sited at the Research Center for Energy and Sustainable Development of the Macedonian Academy of Sciences Arts and other academic institutions (for non-energy sectors).</p> <p>The enhanced NDC is based on a robust analytical work and consultations with the relevant stakeholders aimed at:</p> <ul style="list-style-type: none"> <li>• Identification and validation of possible mitigation PAMs in the target sectors in agreement with the sector policies and planning documents, as well as with the European Policy on Climate and Energy.</li> <li>• Identification and validation of the assumptions used for the modelling of the identified PAMs in line with the sector policies and planning documents, as well as with the European Policy on Climate and Energy.</li> <li>• Prioritization of identified PAMs and providing directions for development of mitigation scenarios with existing and with additional measures.</li> </ul>
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		<p>In particular, the enhanced NDC is built on the understanding that for the realization of the mitigation goals, bottom-up support is needed through active participation of local governance levels. Therefore, it was informed by a number of studies conducted at local level, like <a href="#">Heating Study of the City of Skopje</a> and <a href="#">Transport Study of the City of Skopje</a>, as well as <a href="#">Climate Change Strategy of the City of Skopje: Resilient Skopje</a>.</p> <p>Finally, the process of the enhanced NDC determination involved:</p> <ul style="list-style-type: none"> <li>• 36 national experts and 13 international experts (25 women), to conduct analytical and technical work</li> <li>• 31 stakeholders (17 Governmental Institutions, 5 International Organizations, 3 NGOs, 5 Academia institutions and 1 private company), or at individual level, 667 persons participating in 20 webinars (403 women), to provide data and to discuss and validate the assumptions and results.</li> </ul>
(ii)	Contextual matters, including, inter alia, as appropriate:	
a.	National circumstances, such as geography, climate, economy, sustainable development and poverty eradication;	<p>The Republic of North Macedonia is a small (25,713 km<sup>2</sup>) landlocked country, located in the middle of the Balkan Peninsula. It has a diverse topography with high mountains and deep valleys, large and small natural lakes and picturesque rivers. The agricultural land covers 50% of the surface area while forests cover about one third from the country. The country has a diverse climate, with eight climatic regions.</p> <p>The enhanced NDC was prepared against a backdrop of the country being a candidate for EU membership and becoming 30<sup>th</sup> member of the NATO Alliance. The results from the past reforms including the solid macroeconomic fundamentals, job creation, and an open economy that has attracted foreign investment will help the country to capitalize on this renewed outlook. However, the weak state institutions, low and declining productivity of local firms, and deficiencies in competition and investment policy and business regulation continue to pose serious structural challenges to economic growth. A competitive business legal framework is missing, so the private sector is weak and incapable to fully exploit the country's location. Furthermore, there are risks to fiscal sustainability and the Government has limited fiscal space to stimulate the economy properly. Educational achievement is relatively poor and unequitable which limits labor market in terms of skills to meet the evolving demands of a modern economy, as well as creates inequality in access to economic opportunities. Finally, climate and environmental threats, including air pollution, require urgent attention or they may slow economic growth and reverse poverty reduction.</p> <p>The Voluntary National Review (VNR, 2020) related to 2030 Agenda for Sustainable Development reveals that there is high probability that 27 percent of the SDG indicators will be met by 2030. About 29 percent can be achieved by 2030 with significant policy efforts, whereas the remaining 44 percent seem to be unattainable with the current development mode.</p> <p>Finally, socio-economic impact assessment indicate that COVID-19 has had a serious negative impact on the economy of the Republic of North Macedonia of a magnitude that exceeds that of the 2007-2009 global financial crisis.</p>



b.	Best practices and experience related to the preparation of the nationally determined contribution;	<p>The enhanced NDC capitalized on the <b>analytical capacities, participatory practice, experience, tools and knowledge base</b> that have been created even before the initial NDC, and maintained and enhanced over the SBUR, Energy Strategy, TBUR, NECP and Long-term Strategy on Climate Action timelines. The target setting was well-informed by the <b>existing robust and comprehensive GHG inventory</b>.</p> <p>Furthermore, the <b>enhanced NDC wove the sustainable development into its PAMs</b>, quantifying the nexus of sustainable development and climate change mitigation. Specifically, related to economic and environmental dimensions, MAC Curve was developed to perform economic and environmental evaluation of PAMs. The social aspects of the PAMs are addressed by (i) calculation of <b>the newly created jobs</b>, (ii) introduction of the <b>gender indicators</b> in some of the PAMs with an aim to make them gender-responsive and (iii) organization of a virtual <b>youth consultation</b> on the enhanced NDC, designed to ensure that the voices of young people are expressed in the NDC and that there will be broad ownership for the enhanced NDC goals.</p> <p>The benefits of <b>Circular Economy</b> on GHG emission reduction are analyzed with an aim to identify opportunities and challenges for the mitigation through advancing circular practices in the waste management sector, in line with the European Green Deal and the EU Action Plan on Circular Economy.</p> <p>Regarding <b>the role of the private sector</b> in the mitigation action, it participates with 85% in total investments needed for realization of the PAMs in the Industry sector. So far, supported by feed-in tariff mechanism, 110 private companies have invested in 140 MW RES capacities (dominantly solar and small hydro).</p> <p>Finally, <b>the enhanced NDC includes also a regional dimension</b>. Its contributions to regional development are credibly demonstrated as the five priority measures from the draft Strategy for Regional Development 2019-2029 - (1) Ensuring just transition (Pelagonija and Southwest region), (2) Increasing renewable electricity production (Southeast, East and Northeast region), (3) Increasing energy efficiency in industry (Skopje, Polog and Vardar region), (4) Improving energy efficiency in households (East, Pelagonija, Vardar and Skopje region) and (5) Mitigation of climate change through landfill gas burning (in all regions where regional landfills with waste mechanical and biological treatment will be constructed) are adequately linked to the relevant PAMs from the enhanced NDC.</p>
c.	Other contextual aspirations and priorities acknowledged when joining the Paris Agreement;	<p>The Republic of North Macedonia is a candidate country for EU membership, and as a Western Balkan Contracting Parity of Energy Community committed to work towards the 2050 climate neutrality target – the heart of the European Green Deal, like the rest of the EU in the frame of the Energy Community.</p> <p>In December 2019, the country adopted a National Strategy for Energy Development up to 2040, which is the first strategy of an Energy Community Country which is based on the five pillars of the EU Energy Union - Security, solidarity and trust; A fully integrated internal energy market; Energy efficiency; Decarbonizing the economy; Research, innovation and competitiveness. Hence, the Energy Strategy depicts three scenarios - Reference, Moderate Transition and Green which reflect different dynamics of energy transition and enable flexibility into Macedonian response to relevant EU policies and governance for modern, competitive and climate-neutral economy by 2050</p> <p>The Energy Community is rapidly advancing the implementation of EU regulations for energy governance and integrated climate and energy planning, and the country is leading an exemplary process of developing a draft National Energy and Climate Plan (NECP), the first of its kind in the Energy Community.</p>

		The enhanced NDC echoes the Green scenario from the Energy strategy and is fully aligned with the draft NECP.
b)	Specific information applicable to Parties, including regional economic integration organizations and their member States, that have reached an agreement to act jointly under Article 4, paragraph 2, of the Paris Agreement.	
Not applicable		
c)	How the Party's preparation of its NDC has been informed by the outcomes of the global stocktake, in accordance with Article 4, paragraph 9, of the Paris Agreement;	The Republic of North Macedonia participated in the Talanoa Dialogue in 2018, which generated political momentum for enhanced climate action, including calling for Parties to update their NDCs. Also, the country joined High Ambition Coalition of countries determined to step their climate ambition by 2020. The preparation of the enhanced NDC was in line with the recommendations of the Talanoa Call for Action and High Ambition Coalition, taking into account national circumstances.
d)	Each Party with a nationally determined contribution under Article 4 of the Paris Agreement that consists of adaptation action and/or economic diversification plans resulting in mitigation co-benefits consistent with Article 4, paragraph 7, of the Paris Agreement to submit information on:	
Not applicable		
(i)	How the economic and social consequences of response measures have been considered in developing the nationally determined contribution;	
Not applicable		
(ii)	Specific projects, measures and activities to be implemented to contribute to mitigation co-benefits, including information on adaptation plans that also yield mitigation co-benefits, which may cover, but are not limited to, key sectors, such as energy, resources, water resources, coastal resources, human settlements and urban planning, agriculture and forestry; and economic diversification actions, which may cover, but are not limited to, sectors such as manufacturing and industry, energy and mining, transport and communication, construction, tourism, real estate, agriculture and fisheries.	
Not applicable		

## 5. Assumptions and methodological approaches, including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals:

a)	Assumptions and methodological approaches used for accounting for anthropogenic greenhouse gas emissions and removals corresponding to the Party's nationally determined contribution, consistent with decision 1/CP.21, paragraph 31, and accounting guidance adopted by the CMA;	<p>The Republic of North Macedonia accounts for anthropogenic emissions and removals in accordance with methodologies and common metrics assessed by the Intergovernmental Panel on Climate Change and adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement. It includes all categories of anthropogenic emissions or removals in the enhanced NDC.</p> <p>Coverage of all categories and methodological consistency will be ensured during the enhanced NDC implementation.</p>
b)	Assumptions and methodological approaches used for accounting for the implementation of policies and measures or strategies in the nationally determined contribution;	<p>The policies and measures (PAMs) of the enhanced NDC (total 63) are represented in a tabular format, which among others, includes information relevant for tracking and implementation of the PAMs:</p> <ul style="list-style-type: none"> <li>• progress indicators to monitor implementation with reference values (in the reporting year and in the target year);</li> <li>• finances needed and the potential sources of finances;</li> <li>• implementing and the monitoring entities/institutions are identified;</li> <li>• information of the direct and indirect contributions on the Sustainable Development Goals (SDGs);</li> </ul> <p>The progress indicators will be elaborated within Biennial Update Report or Biennial Transparency Report. Consistency with the required reporting under Energy Community (Energy Efficiency Action Plan and Renewable Energy Action Plan) will be ensured.</p>
c)	If applicable, information on how the Party will take into account existing methods and guidance under the Convention to account for anthropogenic emissions and removals, in accordance with Article 4, paragraph 14, of the Paris Agreement, as appropriate;	<p>The current GHG inventory is prepared using IPCC 2006 Guidelines and 2019 refinement of 2006 IPCC Guidelines (only for fugitive emissions from the Energy sector). As per the IPCC Good Practice Guidance and the 2006 IPCC Guidelines, the national GHG inventory includes robust Quality Assurance and Quality Control (QA/QC) procedures which ensure</p> <ul style="list-style-type: none"> <li>• continuous improvement,</li> <li>• transparency,</li> <li>• consistency,</li> <li>• comparability,</li> <li>• completeness,</li> <li>• accuracy and</li> <li>• timeliness,</li> </ul> <p>enabling to account for anthropogenic emissions and removals, in accordance with Article 4, paragraph 14, of the Paris Agreement.</p>

d)	IPCC methodologies and metrics used for estimating anthropogenic greenhouse gas emissions and removals;	<p>IPCC methodologies: IPCC 2006 Guidelines and 2019 refinement of 2006 IPCC Guidelines (only for fugitive emissions from the Energy sector).</p> <p>Metrics: Global Warming Potentials (GWPs) from the IPCC Fourth Assessment Report (temporal horizon 100 years) were used to facilitate aggregate reporting of GHG emissions, expressed as carbon dioxide equivalents (CO<sub>2</sub>-eq).</p>
e)	Sector-, category- or activity-specific assumptions, methodologies and approaches consistent with IPCC guidance, as appropriate, including, as applicable:	<p>According to the 2006 Guidelines, the GHG emissions and removals estimates are divided into following main sectors:</p> <ul style="list-style-type: none"> <li>• Energy</li> <li>• Industrial Processes and Product Use (IPPU)</li> <li>• Agriculture, Forestry and Other Land Use (AFOLU)</li> <li>• Waste</li> <li>• Other (e.g., indirect emissions from nitrogen deposition from non-agriculture sources)</li> </ul> <p>Each sector comprises individual categories and subcategories, so the national inventory was developed at subcategory level. The inventory covers the GHGs - CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, PFCs and HFCs and precursors and indirect emissions of: CO, NO<sub>x</sub>, NMVOC, SO<sub>2</sub> and NH<sub>3</sub>. The SF<sub>6</sub> emissions are not estimated due to lack of activity data.</p> <p>Methods applied:</p> <ul style="list-style-type: none"> <li>• Tier 2 method using CO<sub>2</sub> emission factors for lignite, residual fuel oil and natural gas for Fuel combustion activities in Energy sector.</li> <li>• Tier 2 method in IPPU sector, for emission factors in Mineral industry, for Cement production and in Metal industry, for Iron and steel production and Ferroalloys production.</li> </ul>
		<ul style="list-style-type: none"> <li>• Tier 2 method in Waste sector, through IPCC FOD method and taking into account the country-specific activity data on waste disposal at solid waste disposal sites and the historical data for GDP and population.</li> <li>• Tier 1, the default method, was used for the other sectors.</li> </ul> <p>The estimates of precursors and indirect emissions (including indirect NH<sub>3</sub> emissions) are based on the EMEP/EEA Emission Inventory Guidebook, 2019. The calculation is performed using the same activity data as for GHG estimations. The estimations for all sectors is done using the Tier 1 approach, except for the category Biological treatment of waste – composting in the Waste sector for which Tier 2 emission factors are applied.</p>
(i)	Approach to addressing emissions and removals from natural disturbances on managed lands;	The following emissions are covered from managed lands: direct and indirect N <sub>2</sub> O emissions from mineral fertilizers and manure and CO <sub>2</sub> emissions from urea and lime use.
(ii)	Approach used to account for emissions and removals from harvested wood products;	Not applicable
(iii)	Approach used to address the effects of age-class structure in forests.	Not applicable
(f)	Other assumptions and methodological approaches used for understanding the nationally determined contribution and, if applicable, estimating corresponding emissions and removals, including:	



(i)	How the reference indicators, baseline(s) and/or reference level(s), including, where applicable, sector-, category- or activity-specific reference levels, are constructed, including, for example, key parameters, assumptions, definitions, methodologies, data sources and models used;	<p><b>Energy</b> Method for scenario development: <u>MARKAL (MARKet ALlocation) model (least cost optimization)</u> <u>Imported electricity emissions: Zero</u> <u>Assumptions for baseline scenario:</u></p> <ul style="list-style-type: none"><li>• <u>Demand drivers</u><ul style="list-style-type: none"><li>✓ <u>Macedonian GDP growth to reach neighboring EU countries' GDP per capita levels of today by 2040</u></li><li>✓ <u>Current Energy Efficiencies policies</u></li><li>✓ <u>Penetration of electric vehicles</u></li></ul></li><li>• <u>Generation investment focus</u><ul style="list-style-type: none"><li>✓ <u>Lignite power plants revitalization choice based on least cost principles</u></li><li>✓ <u>High focus on RES</u></li></ul></li><li>• <u>Carbon price at ETS level in 2027</u></li><li>• <u>Commodity prices based on WEO Current policies scenario (WEO, 2017)</u></li><li>• <u>Fuel supply/availability</u><ul style="list-style-type: none"><li>✓ <u>Lignite production capped at a max level of annual supply expected</u></li><li>✓ <u>Hydro production and wind/solar in line with historical trends and adjusted for new entering power plants</u></li><li>✓ <u>Cross Border Capacities (electricity and gas) evolution in line with ENTSO-E, ENTSO-G and EnC</u></li><li>✓ <u>Sustainable consumption of biomass</u></li><li>✓ <u>Storage (Electric vehicles and pump storage)</u></li></ul></li></ul> <p><b>IPPU</b> <u>Assumptions:</u></p> <ul style="list-style-type: none"><li>• <u>The GHG emissions depends mainly on the increase of the added value in the specific industry.</u></li></ul>
		<p><b>Agriculture and LULUCF</b> <u>Assumptions:</u></p> <ul style="list-style-type: none"><li>• <u>The rate of conversion of the land for the period 2000-2016 will keep the same trend by 2040. The assessment of the values for the period 2013-2040 was prepared employing a simple extrapolation method.</u></li><li>• <u>In livestock, the current state of productivity and management method of the farms is maintained over the whole planning period.</u></li></ul> <p><b>Waste</b> <u>Assumptions:</u></p> <ul style="list-style-type: none"><li>• <u>In 2035, the amount of waste per capita in the country will be as today's level of EU28. After 2035, the amount of waste per capita will start to decline.</u></li><li>• <u>The composition of waste going to solid waste disposal will remain the same during the whole period as of 2016.</u></li></ul>
(ii)	For Parties with nationally determined contributions that contain non greenhouse-gas components, information on assumptions and methodological approaches used in relation to those components, as applicable;	
Not applicable		
(iii)	For climate forcers included in nationally determined contributions not covered by IPCC guidelines, information on how the climate forcers are estimated;	

Not applicable		
(iv)	Further technical information, as necessary;	
Not applicable		
g)	The intention to use voluntary cooperation under Article 6 of the Paris Agreement, if applicable.	The Republic of North Macedonia will study continuously how it can leverage international cooperation under Article 6 of the Paris Agreement.
6. How the Party considers that its nationally determined contribution is fair and ambitious in the light of its national circumstances:		
a)	How the Party considers that its nationally determined contribution is fair and ambitious in the light of its national circumstances;	<p>Following the Talanoa Call for Action, launched by the Presidents of COP 23 and COP 24, the Republic of North Macedonia <u>made its NDC (2020) more ambitious than NDC (2015) (i) articulating the target of 51% reduction in GHG emissions of 2030 compared to 1990 level, instead of 30% deviation from BAU in 2030, and (ii) maintaining the pace of the “ratchet-up mechanism”.</u></p> <p>National commitments are well in line with the emissions pathways towards 2050 that correspond to long term goal of the Paris Agreement. It is further important to note that the evolving nature of a country's circumstances is to be reflected in the consideration of fairness through the following indicators:</p> <ul style="list-style-type: none"><li>• Responsibility reflected in a country's past and current GHG emissions.<ul style="list-style-type: none"><li>✓ <u>County's emissions (2016) as percentage of World emissions (2016): 0.022%</u></li><li>✓ <u>Country's per capita emissions (2016) as percentage of World per capita emissions (2016): 79%</u></li><li>✓ <u>Country's historical emissions (cumulative 1990-2016) as percentage of World emissions (cumulative 1990-2016): 0.032%</u></li></ul></li><li>• Ability to invest in appropriate mitigation measures (capacity to contribute to solving the climate change problem)<ul style="list-style-type: none"><li>✓ <u>GDP growth level:</u> North Macedonia lags behind the Southeast Europe (SEE) average, as well as the Central and Eastern Europe (CEE). As projected by the International Monetary Fund and Ministry of Finance, until 2040 the Macedonian real <u>GDP growth rate</u> will grow at an average rate of 3.3%.</li><li>✓ <u>GDP per capita:</u> Such GDP growth rate could be expected for a developing country, and should lead to convergence towards levels of GDP per capita that are common for developed CEE countries today.</li></ul></li><li>• The mitigation potential and costs<ul style="list-style-type: none"><li>✓ <u>The economic and environmental analyses (MAC curve) has estimated the total reduction in 2030 at 5.6 Tg CO<sub>2</sub>-eq (achievable if all the proposed PAMs are implemented as planned).</u> 70% of the reduction can be achieved with negative costs (with PAMs of “win-win” type which are two thirds of all PAMs).</li></ul></li></ul>

		<p>Furthermore, additional 20% of the reduction can be realized by PAMs with specific costs in the range 0 - 5 €/t CO<sub>2</sub>-eq. Hence, there is relatively high mitigation potential which can be harnessed with cost-effective PAMs. This makes economic case of decarbonization pathway being cheaper than current policy pathway.</p> <p>The investments needed for realization of the decarbonization scenario are estimated at 7.7% of the total average annual GDP. As indicated in the sectoral action plans, beside domestic investments, the country would count on international support (international funds, donors, banks) which will contribute towards adjusting the development pathway of the Republic of North Macedonia towards a low-carbon economy, enhancing further the decoupling of carbon emissions from economic growth and ensuring a decent level of real GDP per capita. Along with the international financial support, the country will also need assistance in the form of technology transfer and capacity building.</p>
b)	Fairness considerations, including reflecting on equity;	It is worthwhile to note that considerations of fairness in the national perspective include a variety of issues and no separate indicator on its own can accurately reflect fairness or a globally equitable distribution of countries' efforts.
c)	How the Party has addressed Article 4, paragraph 3, of the Paris Agreement;	
See 6a.		
d)	How the Party has addressed Article 4, paragraph 4, of the Paris Agreement	Another issue that proves country's enhanced ambitions refers to the application of an economy-wide absolute emission reduction target (in compliance with Article 4, paragraph 4 of the Paris Agreement), which ensures reaching the objectives in a relevant, complete, consistent, transparent, and accurate manner.
e)	How the Party has addressed Article 4, paragraph 6, of the Paris Agreement.	
Not applicable		
7. How the nationally determined contribution contributes towards achieving the objective of the Convention as set out in its Article 2		
a)	How the nationally determined contribution contributes towards achieving the objective of the Convention as set out in its Article 2;	<u>National commitments are well in line with the emissions pathways towards 2050 that correspond to long term goal of the Paris Agreement</u> , thus contributing to stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system, and enabling economic development in a sustainable manner, as set in Article 2 of the Convention.
b)	How the nationally determined contribution contributes towards Article 2, paragraph 1(a), and Article 4, paragraph 1, of the Paris Agreement.	Given its unique national circumstances and particular set of challenges, the enhanced NDC is challenging and ambitious, and aims to support the collective effort to reach global peaking of GHG emissions as soon as possible, and to undertake rapid reductions thereafter in accordance with best available science, as set out in Article 4.1 of the Paris Agreement.

# Additional activities

06

## Economic and environmental evaluation of the Policy and Measures

Marginal Abatement Cost (MAC) Curve tool was applied in order to evaluate the economic and environmental effectiveness of PAMs. As depicted in the MAC curve (Figure 1), the total reduction in 2030 amounts 5.6 Tg CO<sub>2</sub>-eq (achievable if all the proposed PAMs are implemented as planned). 70% of the reduction can be achieved with negative costs (with PAMs of “win-win” type which are two thirds of all PAMs). Furthermore, additional 20% of the reduction is realized by PAMs with specific costs in the range 0 - 5 €/t CO<sub>2</sub>-eq

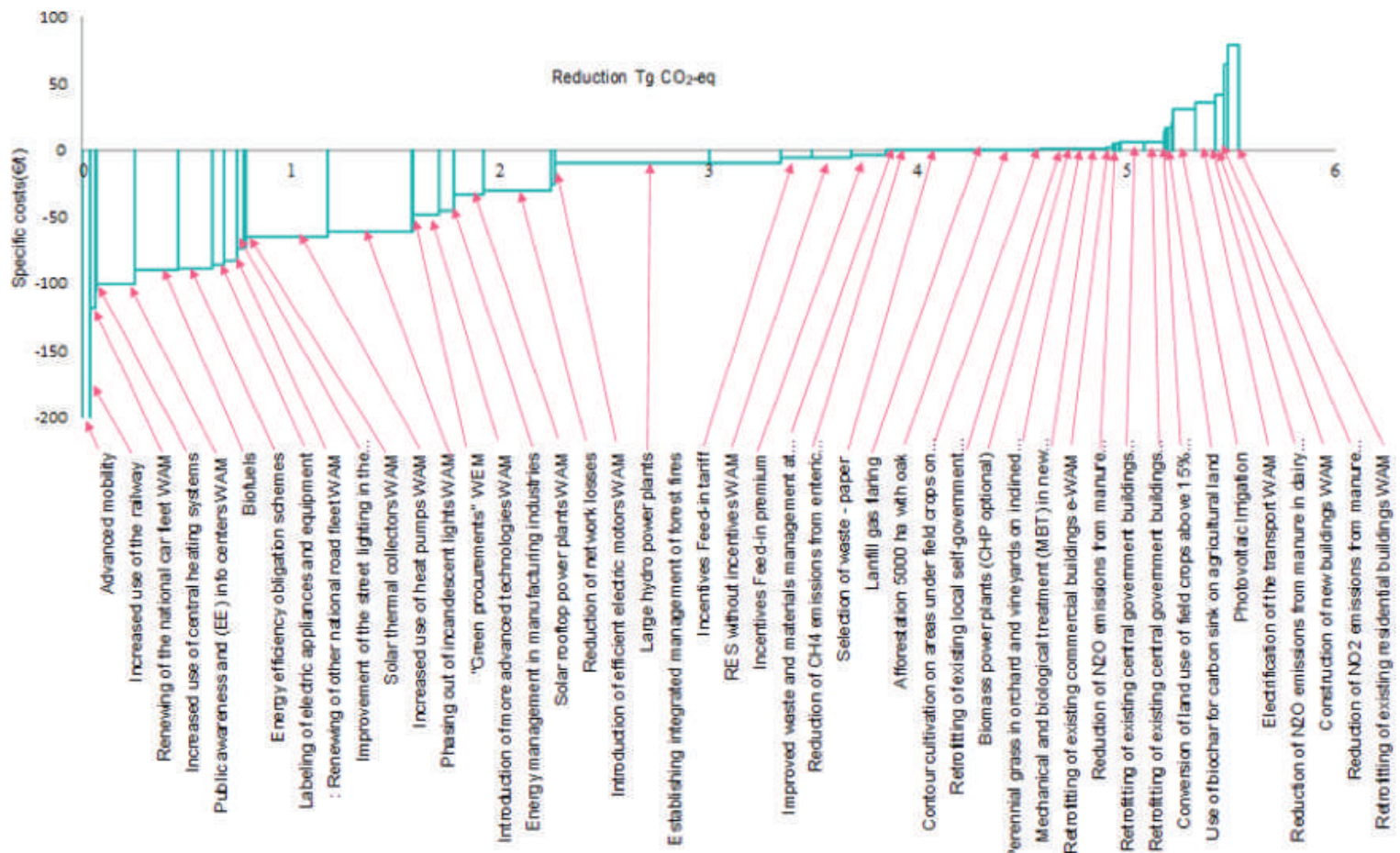


Figure 1. The marginal abatement cost curve for 2030



## Social aspects of the Policy and Measures

**Jobs:** It was shown that the enhanced NDC would bring new jobs, almost 8,000 in 2030 and 10,000 in 2035, with dominant contribution of energy efficiency PAMs of 77% (Figure 2). PAMs with the highest share in the number of new domestic green jobs are: Retrofit of existing residential buildings (42%), Construction of passive houses (21%), RES without incentives (6%) and Solar thermal collectors (8%).

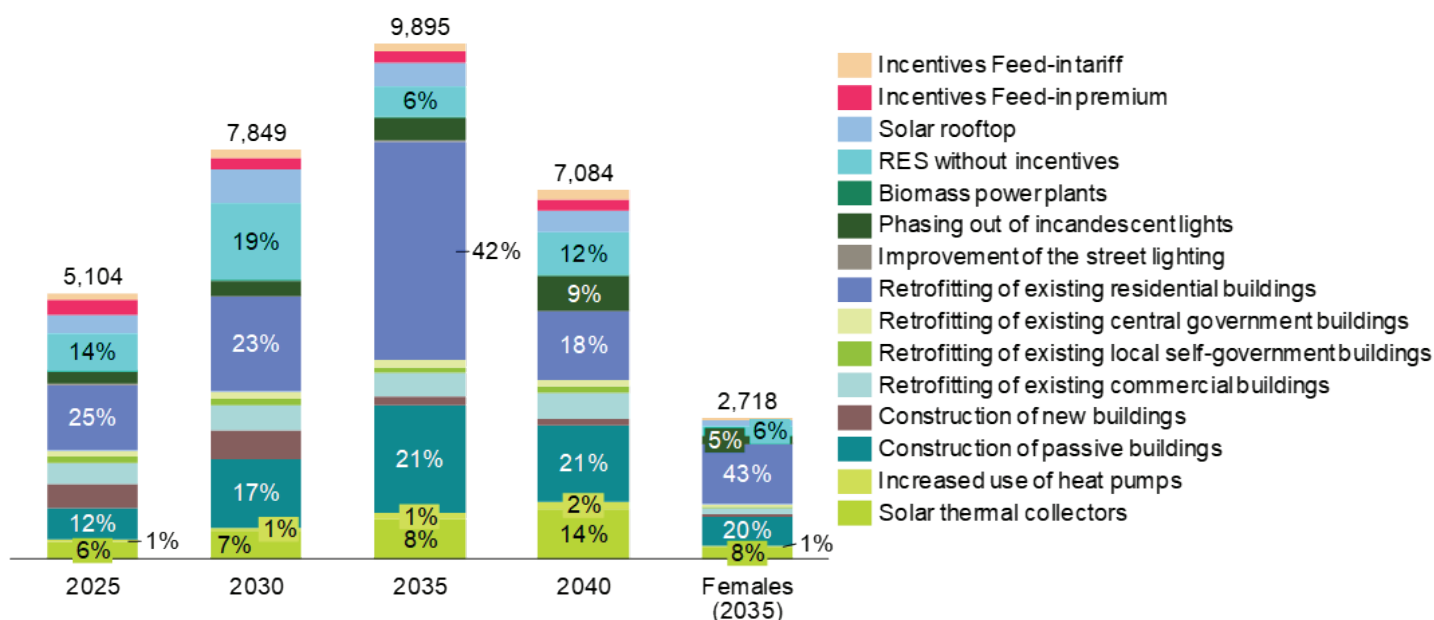


Figure 2. Number of domestic green jobs by PAMs

**Gender:** Based on the types of the newly created jobs, very basic analysis indicated that at least 27% of the jobs in 2035 can be assigned to women. Furthermore, the PAMs were analyzed in light of their gender responsiveness. It was found that there are number of PAMs where gender disaggregated approach would improve the implementation, particularly the PAMs related to subsidizing mitigation technologies and awareness rising. Subsequently, with an aim to make the enhanced NDC gender-responsive, the respective PAMs were redesigned and gender indicators included. Most prominent example is redesign of the “first come, first served” subsidy model to a gender informed model that supported 10,000 most vulnerable households in most affected cities in the country to replace their heating technology with more efficient one.

**Youth:** A virtual youth consultation on the enhanced NDC was organized to ensure that the voices of young people are expressed in the NDC and that there will be broad ownership for the enhanced NDC goals. As a result, three pressure points vital to ensuring the quality and impactfulness of youth engagement in the Climate Promise have been recognized and weaved into the design of the Youth for Climate platform. They include:

- Establishing rapport with the use of interactive tools.
- Broadening the conversation beyond the “climate niche” by introducing content related to social, economic and technological trends impacting the development of the country.
- Recognizing informality in youth-led climate action.

Based on the results of the consultations, three key action points on the strategic level have been identified and incorporated into the NDC:

Based on the results of the consultations, three key action points on the strategic level have been identified and incorporated into the NDC:

- Designing a systemic, long-term approach to youth engagement in consultations and decision-making regarding national and local climate policies and actions, including new mechanisms, new roles and new tools.
- Incorporating feedback loops into the existing system, allowing for two-way communication and monitoring of climate-related activities designed and implemented by the youth and/or public administration.
- Revising educational and mainstreaming approaches and tools used to inform young people and broader public about the causes and consequences of climate crisis, including the topic of individual impact.

08

### The role of the private sector

The role of the private sector in the mitigation action is particularly analyzed through consideration of additional PAMs in the Industry sector that contribute to (i) increasing energy efficiency, (ii) increasing renewable sources utilization for electricity production and (iii) improving waste management, and hence improving the productivity of the companies and reducing their emissions (total GHG emissions by 10.6% and local emissions (SOx) by 98%.

Regarding investments, the private sector has a dominate role as it participates with 85% in total investments needed for realization of the PAMs in the Industry sector. So far, supported by feed-in tariff mechanism, 110 private companies have invested in 140 MW RES capacities (dominantly solar and small hydro). According to the official data from the State Statistical Office, the number of companies in the sector “Electricity, gas, steam and air conditioning supply” in 2018 doubled compared to 2017 (224 vs. 107) which is mainly a result of the companies which invested in renewables. Having in mind that more than 2,000 MW (solar, wind, small hydro, biomass and biogas) are projected by 2040, it is expected that this prominent role of the private sector will be sustained and even enhanced.

09

### SDGs - enhanced NDC synergies and trade-offs

Aiming at understanding the contribution of the enhanced NDC to the national SD agenda, the SCAN tool and the newly developed Q-SCAN tool were applied to identify and quantify their synergies and trade-offs. Figure 3 depicts the aggregated synergies and trade-offs of three sectors from the enhanced NDC - Electricity & heat, Transport, Buildings.

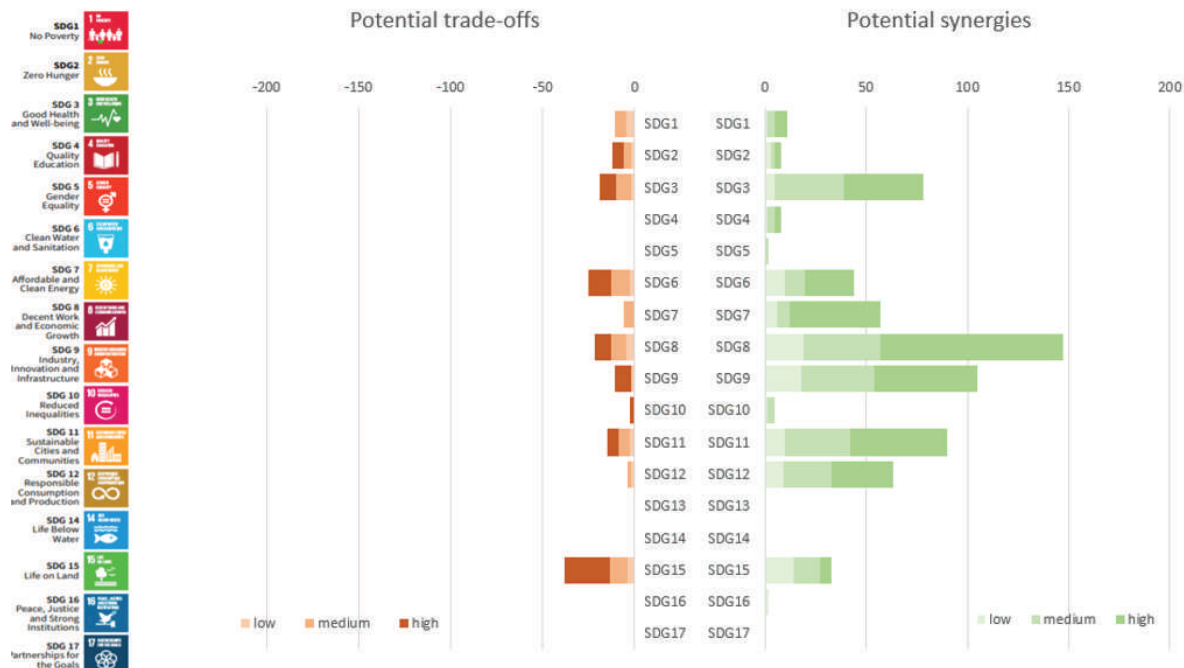


Figure 3. Electricity & heat, Transport, Buildings sectors – Synergies and Trade-offs

The pattern of the integral scores follows the pattern of the sector Electricity & Heat, which indicates that this sector is dominant in influencing the SDGs. The strongest synergies remain with SDG 8: Decent work and economic growth due to the new job opportunities in renewable energy deployment and in the construction and retrofit market; sustained economic growth, improved economic efficiency per unit of product and sustained support of entrepreneurship.

The most significant trade-off is with the SDG 15 Life on land, due to the land requirements from renewable energy projects, potential forest degradation and potential river routes changes. However, the highest synergies are almost three times stronger than the highest trade-offs.

## 10

### Circular Economy

The benefits of Circular Economy on GHG emission reduction are analyzed with an aim to identify opportunities and challenges for the mitigation through advancing circular practices in the waste management sector. Six case studies were selected, as to include:

- Construction & Demolition Waste (C&D)
- Biowaste
- Secondary Residual Fuels (SRF)
- E-Waste
- End of Life Vehicles
- Plastics

Overall, it was assessed that applying circular practices to the selected case studies and waste streams by 2030, can deliver: 951 Gg CO<sub>2</sub>-eq/year savings, 2,740 new jobs and 47.17 million EUR of economic benefits. Therefore, the shift to circular practices, even if it is restricted to those six case studies, is enough to counterbalance the emissions from solid waste disposal (almost double savings), and the emissions from the Waste and Industrial Processes and Product Use sectors. To achieve these benefits, a shift in governance practices is required and several policy recommendations are made, starting with the proposal to create a governmental cross-cutting agenda on circular economy.

# Follow up activities

11

## **Covid-19 related revisions**

The energy transition is happening with an accelerated pace - renewables are growing fastest even as fossil fuels continue to dominate and clean technologies are opening up major new opportunities for industry and investors, even if capital markets are slower to align with the climate economy. Both solar and wind power are becoming significantly more competitive. It seems that with Covid-19 the world was just handed a once in a lifetime opportunity to fundamentally alter the energy landscape. The Republic of North Macedonia is in phase of refinement of the post-pandemic economic and emissions scenarios from the Energy Strategy, integrating the changes of fuel and technologies prices, supply chain disruptions, impact on trade and share market, as well as changes at energy demand side due to the overall slowdown of economy in the assumptions of the existing models. This will affect the enhanced NDC scenarios, but notably, they are likely to be even greener.

12

## **“Climate promise” ongoing/planned activities**

The UNDP Climate promise project will not stop supporting the NDC process, as a number of activities will continue or will be undertaken after the submission of the enhanced NDC, with an aim to strengthen its implementation prospects. A note is made to the following activities that shall be completed by June 2021:

- Build political will and national ownership and engagement for the NDC through policy dialogues with the key national stakeholders (key ministries, local governments, CSOs, youth constituencies, academia, private sector);
- Engage UNFCCC and Gender Focal Points, Gender Machinery and Parliamentary Commission on Equal Opportunities to promote leadership roles for women in climate action;
- Carry out socio-economic impacts of NDC targets/measures;
- Develop de-risking roadmap (policy de-risking and financial de-risking). The policy roadmap will address legislation and regulation as well as human and institutional capacity. The financial de-risking will cover market development, support schemes, and financing mechanisms. This work will also highlight opportunities for private investment or public-private partnerships in NDC actions and propose specific measures to de-risk these investments;
- Prepare strategy for financing NDC implementation. This work will articulate proposed funding sources for all NDC actions, including those where action could be best served by realigning public finance flows and/or adopting fiscal policies and measures. It will also identify investors with portfolios that align with these opportunities;
- Explore the possibility for introduction of carbon tax in the country. This work will assess the potential for a carbon tax to finance NDC measures and will explore the associated costs and benefits. The results of the assessment will be presented to policy-makers and the media in a high-level briefing;
- Conduct institutional capacity assessment to identify critical skills gaps for NDC implementation and development of a mid-term capacity building plan.
- Strengthen and improve data for tracking progress of NDCs. This activity will be continuously supported within UNDP CBIT project.



The Republic of North Macedonia plans to develop a National Adaptation Plan (NAP) based on nexus approaches in following areas: water, food, energy, health, biodiversity, tourism, forestry, disaster risk reduction, loss and damage, built in infrastructure. The NAP will incorporate cross-sectorial and sector-specific adaptation actions and measures, along with identified adaptation investment priorities based on the review of national and sectorial development policies and plans, and the outcomes of an extensive consultation process, including stakeholders from all sectors and levels of governance, climate-related institutions and agencies, along with private sector, civil society, academia and women associations and youth NGOs representatives. In addition, the climate change adaptation component will be included within the Disaster Risk Reduction Strategy which is prepared in line with the Sendai Framework for Disaster Risk Reduction. Therefore, the Republic of North Macedonia could include Adaptation component in the subsequent NDC as the mentioned strategic documents would be able to inform it.





Republic of North Macedonia  
**Ministry of Environment  
and Physical Planning**

**The Macedonian enhanced Nationally Determined Contribution  
has been prepared with UNDP support, through the Climate  
Promise Initiative**