First Biennial Transparency Report of the Republic of Serbia to the United Nations Framework Convention on Climate Change and Paris Agreement

Table of content

List of Figures

List of Tables

Executive summary

The Paris Agreement represents a landmark global accord to combat climate change, aiming to limit global temperature rise to well below 2°C while pursuing efforts to cap it at 1.5°C above pre-industrial levels. Under this framework, countries are required to submit Biennial Transparency Reports (BTRs), which serve as key instruments to monitor and report progress on nationally determined contributions (NDCs). These reports provide detailed information on greenhouse gas (GHG) inventories, mitigation actions, and progress in achieving NDC targets, thereby fostering transparency and accountability among Parties.

Serbia, as a non-Annex I Party to the UNFCCC and a signatory to the Paris Agreement, has undertaken its first BTR submission in alignment with Decision 18/CMA.1 of the UNFCCC. This report showcases the country's commitment to fulfilling its international obligations while addressing climate change challenges at the national level. It reflects Serbia's efforts to enhance climate resilience, reduce GHG emissions, and transition towards a low-carbon economy.

Serbia's Nationally Determined Contribution (NDC) under the Paris Agreement reflects its commitment to combating climate change and transitioning toward a low-carbon economy. The country's first NDC, submitted in 2017 and updated in 2022, commits to a 33.3% reduction in greenhouse gas (GHG) emissions by 2030 compared to 1990 levels, excluding emissions and removals from the LULUCF sector. This target represents a significant increase in ambition from the original NDC, which aimed for a 9.8% reduction. The updated NDC also aligns with Serbia's Low-Carbon Development Strategy and National Energy and Climate Plan, which outline a roadmap to integrate renewable energy and enhance energy efficiency.

Serbia's unique national circumstances, including its geographic position, aging population, and dependence on lignite for energy production, pose significant challenges to climate action. However, the country has made strides in renewable energy development, particularly in wind and solar power, and aims to increase the share of renewables in its gross final energy consumption to 40% by 2030.

The report outlines progress toward this target through the implementation of mitigation policies and measures across key sectors such as Energy through efficiency improvements, modernization of the energy sector, and penetration of renewable energy sources are central to achieving the NDC. For the first time, Serbia has also prepared the National Inventory Document (NID) in compliance with the requirements of Decision 18/CMA.1, showcasing the effectiveness of its recently adopted legal framework.

As of 2022, Serbia's greenhouse gas (GHG) emissions stood at 62.6 Mt CO2e (excluding LULUCF), marking a 24.3% reduction compared to 1990 levels. This achievement highlights the country's significant progress in decoupling economic growth from emissions. Contributing factors include structural economic transformations, enhanced energy efficiency, and the growing integration of renewable energy sources. These efforts position Serbia on a steady path toward meeting its climate goals.

Within the Serbia's GHG inventory, the Energy sector is the primary source of emissions, accounting for 78.8% of the national total in 2022. Other sectors, including industry, agriculture, and waste management, contribute 8.2%, 7.8%, and 5.2%, respectively. The LULUCF sector plays a critical role in balancing Serbia's greenhouse gas emissions by acting as a significant carbon sink, removing an equivalent of 7% of the total emissions in 2022.

In accordance with the decision 18/CMA.1 The this document also includes three scenarios for GHG emissions which are aligned with the scenarios used for the preparation of the Low-Carbon Development Strategy:

Without Measures (WOM): A baseline scenario reflecting no additional mitigation actions. With Existing Measures (WEM): A scenario incorporating current policies as contained in the adopted Low-carbon Development strategy. With Additional Measures (WAM): An ambitious scenario assuming enhanced mitigation measures. The WAM scenario demonstrates the highest potential for overachieving existing NDC target with significant international financing NDC support, emphasizing the importance of investments in renewable energy and energy efficiency.

ADAPTATION

The Republic of Serbia pays an annual contribution to international conventions on climate change, including the Framework Convention, which supports activities aimed at combating climate change. In accordance with the Paris Agreement, the fight against climate change is defined by measures and activities within public policy documents, such as the Low Carbon Development Strategy, the Adaptation Program and INEKP.

The Republic of Serbia will need international support for the implementation of the measures established by the public policy documents.

Sector	Energy	Industry	Transport	Forestry	Agriculture	Cross sectoral
Billions USD	5.19	3.88	1.62	0.41	0.06	2.60

Table 1: Amount of required financial support by sector

In the previous period, with the support of international institutions, the Republic of Serbia implemented numerous projects in the field of climate change, which were mainly aimed at strengthening capacities, including support for fulfilling reporting obligations under the UNFCCC. Certain projects implemented in the previous period included the development and transfer of technology, primarily in the energy sector in order to improve the capacities of renewable energy sources and energy efficiency.

Significant progress in the implementation of projects that contribute to the fight against climate change confirms the commitment of the Republic of Serbia and solid capacities for resource management in the implementation of planned initiatives.

1 National circumstances

1.1 Geographic characteristics and climate profile

The Republic of Serbia is a continental European country with 75% of its territory belonging to the Balkan Peninsula and 25% to Central Europe, occupying a total area of 88,499 km2. In a physical geographical sense, it is made up of three dominant geographical units: the Pannonian plain, which includes Vojvodina, the northern, lowland part of Serbia and a narrow strip south of the Danube and Sava rivers, hilly areas with lower mountains and plains, and mountainous areas. The highest mountain peak is Đeravica on Prokletije (2,656 m).

The rivers of the Republic of Serbia belong to the basins of the Black, Adriatic and Aegean Seas. Most of the territory of the Republic of Serbia belongs to the Danube basin, which flows through Serbia with a length of 588 km.

The climate of Serbia is moderate-continental with more or less pronounced local characteristics. All four seasons are expressed. The warmest month is July, and the coldest is January. Most of Serbia has a continental precipitation regime with higher amounts of precipitation in the warmer part of the year and the highest monthly amount of precipitation during June, while the lowest is during February and October. Snow coverage is characteristic for the period from November to March. The highest number of days with snow coverage is in January. Winds from the northwest and west prevail in the warmer part of the year, while the east and southeast winds (Košava) are characteristic for the colder part of the year.

1.2 Social and political arrangement

The Republic of Serbia is a parliamentary democratic republic based on the rule of law. Since March 2012, it has the status of a candidate for EU membership.

The political system is based on the principle of division of power into executive, legislative and judicial. The holder of the highest judicial authority in the Republic of Serbia is the Constitutional Court, the Supreme Court.

Administratively and territorially, the Republic of Serbia is divided into provinces, regions and administrative areas. It consists of two autonomous provinces: AP Vojvodina (21,614 km2) in the north and AP Kosovo and Metohija (10,910 km2) in the south. The total number of local self-government units is 197 (municipalities/city municipalities and cities). According to the average size of the territory and the number of inhabitants, local self-government units of Serbia are among the largest basic units in Europe.

According to the last population census from 2022, the estimated number of inhabitants is 6,664,449, of which 51.4% are women (3,423,627) and 48.6% are men (3,240,822) [1]. The average age of the population of the Republic of Serbia increased from 42.1 (in 2011) to 43.8 years (in 2022), which ranks the Republic of Serbia among countries with a deep demographic age. In addition to

[1] Statistical Yearbook of the Republic of Serbia, 2023 - https://www.stat.gov.rs/sr-cyrl/publikacije/publication/?p=15431

Serbs (80.6%), the most numerous are Hungarians (2.8%), followed by Bosniaks (2.3%) and Roma (2%).

The largest cities are Belgrade (with 1,685,563 inhabitants), Novi Sad (with 367,121 inhabitants), Niš (with 249,816 inhabitants) and Kragujevac (with 171,628 inhabitants).

1.3 Economy

In 2022, the Republic of Serbia recorded a GDP growth of 2.5% compared to the previous year. In 2022, agricultural production experienced a decline in physical volume of 8.1%. In the same period, industrial production recorded a growth of 1.5%, and the manufacturing industry a growth of 1.7%.

According to the 2022 Greenhouse Gas Inventory, GHG emissions were equal to 62,572.6 kt CO2eq in the Republic of Serbia, excluding the contribution of the LULUCF sector, which corresponds to a 24.3% reduction compared to 1990 emissions levels.

The energy sector is the dominant source of GHG emissions in 2022 in the Republic of Serbia, contributing 78.8% of national GHG emissions. With the adoption of the Law on the Use of Renewable Energy Sources[2] in 2021 and its amendments from 2023, the way has been opened to a more successful transposition of European legislation on renewable energy sources and an increase in the capacity of energy production from renewable sources.

The industrial sector generates about a quarter of GDP, employing slightly more than 27% of the employed population. The processing industry dominates - automotive, electrical and electronic, production of machines, equipment, textile industry and metallurgy - with a share of 13% in GDP in 2021.

Serbia has a high share from agriculture in the gross domestic product, which ranks it among agricultural countries. Plant production participates with 68.4%, and livestock production with 31.6%. Production of agricultural goods and services increased by 39.3% since 2011. The largest part of agricultural land is used as arable land and gardens (74.5%), of which 67.7% is sown with grain. In the total used agricultural area in 2022, arable land and gardens account for 74.5%, orchards for 5.3%, vineyards for 0.6%, meadows for 9.5% and pastures for 9.5%. There is a noticeable trend of changing the purpose of land use, primarily as a result of the uncontrolled urban growth of the construction area and the intensive expansion of certain urban settlements at the expense of agricultural land.

According to the data of the Second National Inventory, forests cover 39.01% of the country's territory[3]. In relation to ownership, state forests cover 41.73% compared to 58.27% of private forests. During 2021, the intensity of damage from natural disasters in state forests increased by about 60% compared to the previous year.

In 2022, according to the data of the Environmental Protection Agency, 17.7% of municipal waste was recycled, and local self-government units participate in this with only 3%. Of the total produced 3.18 million tons of municipal waste, about 45.6% is biodegradable waste.

[2] https://www.paragraf.rs/propisi/zakon-o-koriscenju-obnovljivih-izvora-energije.html
[3] Results of the National Inventory of forest of the Republic of Serbia - upravazasume.gov.rs

Industry and product use, agriculture and waste sectors contribute 8.2%, 7.8% and 5.2% of national GHG emissions, excluding LULUCF, in 2022.

The share of transport in GDP is 3.4% in 2021. Transport includes road, rail, water and air transport. Road transport traditionally represents the dominant type of transport, with a share of around 80% in the total volume of transported cargo, ie with around 74% in the total number of transported passengers. Indices of the physical volume of land transport services increased in the period 2016 - 2021 by 43.8%, mainly due to the increase in the volume of road (72.9%) and river (103.3%) traffic, while the volume of rail and air traffic services reduced.

Water supply is provided from over 150 public waterworks. The key source of water pollution is untreated industrial and communal waste water, drainage water from agriculture, leachate from landfills, as well as pollution related to river navigation and the operation of thermal power plants.

1.4 Legislative framework / Fulfillment of obligations under the UN Framework Convention on Climate Change and the Paris Agreement

The Republic of Serbia is a member of the Framework Convention since 2001 (status of non-Annex I countries), and since 2017 of the Paris Agreement with the adoption of the Law on Ratification of the Paris Agreement[4]. The Ministry of Environmental Protection (hereinafter: MEP) is the competent institution and policy coordinator in the field of climate change and the focal point for the implementation of the Framework Convention in the Republic of Serbia.

In accordance with the obligations under the Paris Agreement, the Government of the Republic of Serbia submitted its Intended National Determined Contributions (INDC) in June 2015, defining a 9.8% reduction in GHG emissions by 2030 compared to emissions from 1990, and in August 2022 it adopted the revised Nationally Determined Contribution Contribution-NDC) by submitting which the Republic of Serbia increases its ambitions in terms of reducing GHG emissions by 33.3% by 2030 compared to 1990, i.e. 40.3% including the LULUCF sector.

The low-carbon development strategy of the Republic of Serbia for the period from 2023 to 2030 with projections up to 2050[5] was adopted in 2023 and foresees a reduction of GHG emissions without LULUCF by 33.3% by 2030, which will be achieved primarily by reducing emissions in the production of electricity and heat, by increasing energy efficiency and using renewable energy sources, but also by measures in other sectors. The goal of reducing GHG emissions, which includes the LULUCF sector, is 40.3% by 2030 compared to 1990.

The program of adaptation to changed climate conditions for the period from 2023 to 2030, which contains the Action Plan as an integral part[6], was adopted in December 2023. The adaptation program that was developed as part of the project and financed from the Green Climate Fund "Improvement of medium- and long-term planning of adaptation measures to changed climate conditions in the Republic of Serbia" aims to identify the impacts of climate change on sectors and systems, and 25 adaptation measures have been identified, which are defined as priority and feasible by 2030 for those

[4] https://pravno-informacioni-sistem.rs/eli/rep/mu/skupstina/zakon/2017/4/19/reg
[5] https://pravno-informacioni-sistem.rs/eli/rep/sgrs/vlada/strategija/2023/46/1/reg
[6] https://www.ekologija.gov.rs/sites/default/files/2024-01/program-prilagodjavanja-na-izmenjene-klimatske-uslove-za-period-od-2023-do-2030-godine.pdf

sectors in which it is necessary to reduce adverse impacts. At the same time, the web portal *Digital Climate Atlas of Serbia*[7] was developed. The portal provides the possibility of viewing and downloading relevant climate data for the analysis of climate changes and impact, for the needs of adaptation planning from the national to the local level. data.

This year, the Government of the Republic of Serbia adopted the Integrated National Energy and Climate Plan of the Republic of Serbia for the period up to 2030 with projections up to 2050[8] as proposed by the Ministry of Mining and Energy. It represents a key strategic document that, in terms of renewable energy sources, energy efficiency and reduction of GHG emissions, defines the goals for the year 2030 and foresees concrete measures and policies to achieve them.

The Law on Climate Change[9] was adopted in 2021 and aims to establish a system for reducing GHG emissions and adapting to changed climate conditions.

The law was made operational by the adoption of six by-laws: Regulation on types of activities and greenhouse gases[10] from 2022, Regulation on types of data, bodies and organizations and other natural and legal entities that submit data for the preparation of the National Inventory of Greenhouse Gases[11] from 2023, Rulebook on Verification and Accreditation of Verifiers of Reports on Greenhouse Gas Emissions[12] from 2021, Rulebook on Data on the economy of fuel consumption and CO2 emissions from new passenger vehicles[13] from 2022 with amendments to the Rulebook from 2023, the Rulebook on the contents of the National Inventory of Greenhouse Gases and the National Report on the Inventory of Greenhouse Gases[14] from 2023 and the Rulebook on monitoring and reporting on greenhouse gas emissions[15] from 2023.

To facilitate the issuance of permits for emissions of greenhouse gases, an IT/digital system - e GHG platform was developed. The permit issuance process started in 2024, establishing a system for monitoring, reporting and verification of gases with a greenhouse effect at the installation level.

The National Council for Climate Change, as an advisory body of the Government, was established in accordance with the Law on Climate Change. It plays a significant role in achieving social and political consensus on climate change issues. The National Council is led, acting as president, by the minister responsible for environmental protection, and it consists of representatives of the aforementioned Ministry and of other bodies and organizations, representatives of the scientific and professional community, as well as representatives of civil society, whose area of competence is important for determining and implementing activities in this area.

In accordance with the obligations arising from the Framework Convention, in the previous period the MEP submitted the First Report of the Republic of Serbia according to the United Nations Framework Convention on Climate Change in 2010, the Second Report of the Republic of Serbia according to the

[7] https://atlas-klime.eko.gov.rs/lat/map?dataType=mod&visualization=pro&area=townships
[8] https://www.paragraf.rs/glasila/rs/sluzbeni-glasnik-republike-srbije-70-2024.html
[9] https://www.paragraf.rs/propisi/zakon-o-klimatskim-promenama.html
[10] https://pravno-informacioni-sistem.rs/eli/rep/sgrs/vlada/uredba/2022/13/1
[11] https://pravno-informacioni-sistem.rs/eli/rep/sgrs/vlada/uredba/2023/43/7/reg
[12] https://pravno-informacioni-sistem.rs/eli/rep/sgrs/ministarstva/pravilnik/2021/107/6
[13] https://pravno-informacioni-sistem.rs/eli/rep/sgrs/ministarstva/pravilnik/2022/107/1/reg
[14] https://pravno-informacioni-sistem.rs/eli/rep/sgrs/ministarstva/pravilnik/2023/55/3
[15] https://pravno-informacioni-sistem.rs/eli/rep/sgrs/ministarstva/pravilnik/2023/118/6/reg

UN Framework Convention on Climate Change in 2017 and the Third Report of the Republic of Serbia according to the United Nations Framework Convention on Climate Change in 2024.

The first Biennial Update report of the Republic of Serbia according to the UN Framework Convention on Climate Change was submitted in 2016, and the Second Biennial report of the Republic of Serbia according to the UN Framework Convention on Climate Change in 2023.

Serbia is actively working on the path towards EU membership, which includes harmonizing its institutions and policies with European standards. Serbia has candidate status and is engaged in current negotiations with the EU on various political and economic reforms.

2 Inventory of greenhouse gases

2.1 National circumstances, institutional framework and information about the inventory of greenhouse gases and climate changes

In accordance with the Law on Climate Change, the Environmental Protection Agency is in charge of establishing and managing the GHG Inventory and preparing the GHG Inventory Report. The Agency prepares a GHG Inventory by January, 15th of each year, a GHG Inventory Report by March, 15th of each year, and a GHG Inventory with provisional data for the previous year by July, 31st of each year.

Also, the Agency develops and implements the Quality Assurance and Data Quality Control Plan for the purposes of creating and improving the quality of the GHG Inventory.

Serbia's NID with detail description of the GHG inventory is submitted electronically as a stand-alone report..

2.2 Summary of trends related to national emissions and removals

The emissions of GHG, which contribute directly to the greenhouse effect, expressed in CO_2 equivalent, amount a total of 62.6 Mt CO_2e in the Republic of Serbia in 2022, excluding LULUCF (land use, land-use change and forestry) contribution, which corresponds to a decrease of 24.3% compared with the emission levels of 1990. Since 2009 and the global economic downturn, the national emissions of the Republic of Serbia, excluding LULUCF, have been rather stable, except for 2014 where significant floods occurred, disrupting the mining activity over the territory of Serbia.

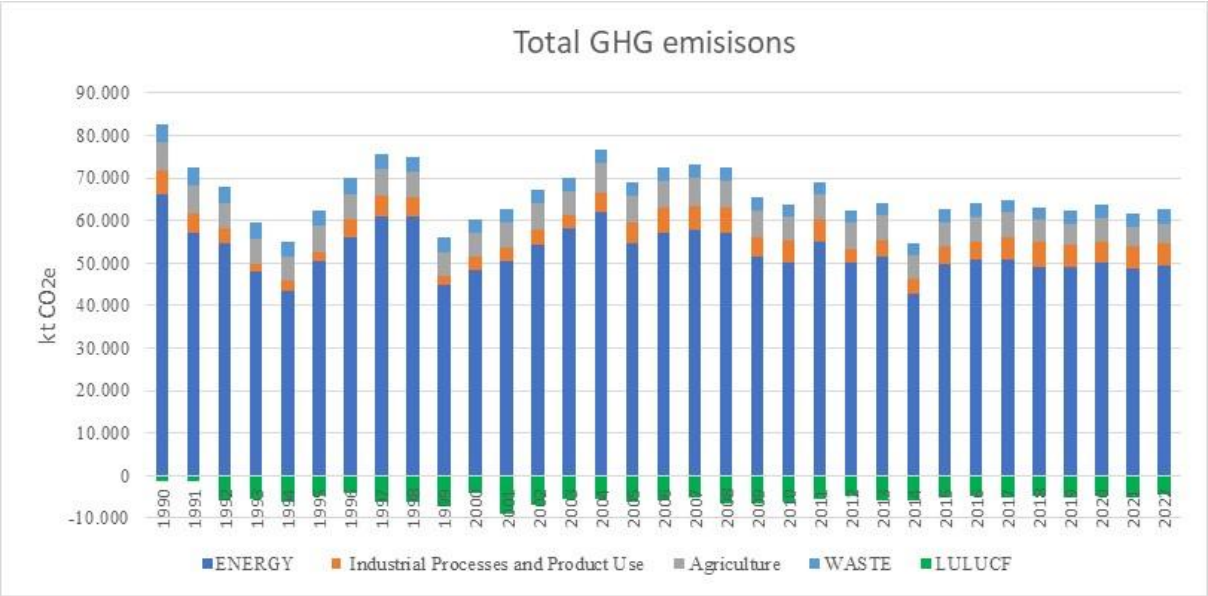


Figure 1: Evolution of GHG emission in Serbia in the period 1990-2022

The national GHG emissions of the Republic of Serbia including the LULUCF contribution amount 58.0 Mt CO_2e in 2022, and decreased of 28.6% compared with 1990, and follow a similar trend to the emissions including the LULUCF contribution. This overall trend does not enable to observe the different trends depending on the GHG considered. Without considering LULUCF, the national CO_2 emissions decreased by 24.1% in 2022, compared with 1990, whereas CH_4 and N_2O decreased by 29,2% and 11,6%, respectively, over that same period.

In 2022, the contributions of the different GHG to the national emissions excluding LULUCF are rather similar to the ones observed in 1990, with CO_2 the most predominant substance with 82,2%, followed by CH_4 (13,9%) and N_2O (3.5%), whereas the other substances contribute more negligibly with 0.1% for SF_6 and 0.3% for HFCs. Nevertheless, it is important to notice the increasingly HFC emissions, related to the use of refrigerants, which were not occurring in 1990.

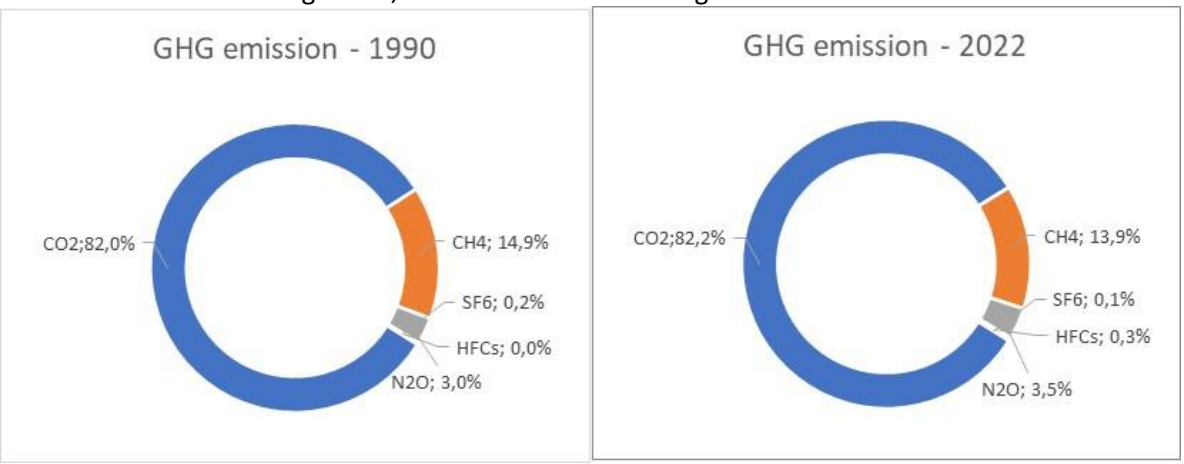


Figure 2: Share of GHG emission per GHG in 1990 and 2022

Table 2: Sources of emissions and sinks of GHG (kt CO2eq)

Table 3: Distribution of GHG (kt CO2eq)

2.3 Overview of source and sink category emission estimates and trends

The energy sector is the predominant source of GHG emissions in 2022 (as well as over the whole period), in the Republic of Serbia, contributing to 78.8% of the national GHG emissions without considering LULUCF contribution. The industrial process and product use, agriculture and waste sectors respectively contribute to 8.2%, 7.8% and 5.2% of the national GHG emissions excluding LULUCF, for the year 2022. Since 1990, all contributions have been varying but are rather stable in 2022, compared with 1990. Meanwhile the relative contribution of the energy sector (CRT 1) has slightly decreased, which was of 80.2% in 1990, while the industrial processes and product use (CRT 2) increased from 6.7%, to 8.2%, over the same period.

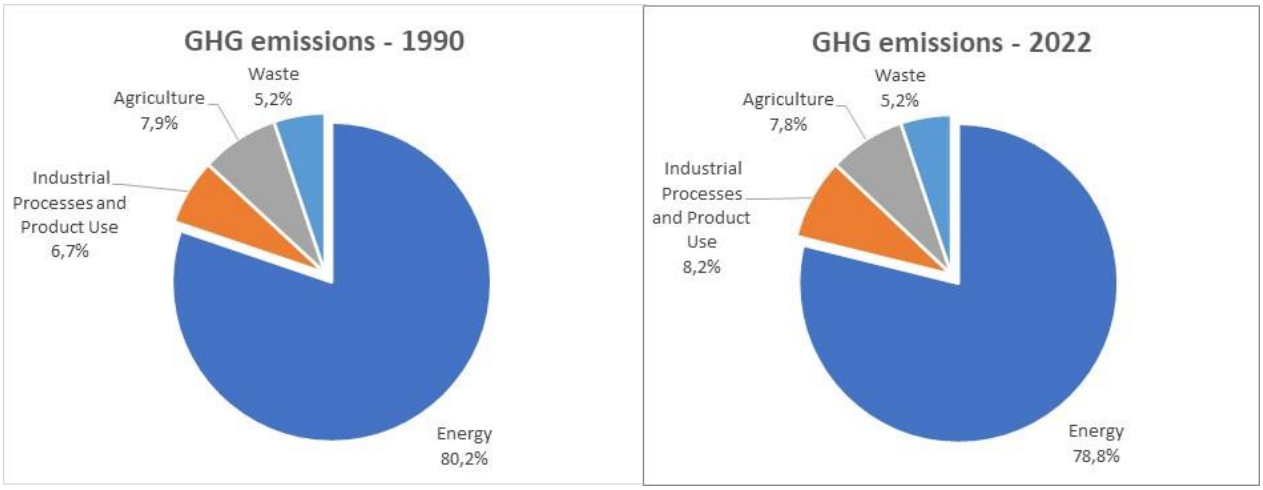


Figure 3: Share of GHG emission per sector in 1990 and 2022

Key trends between 1990 and 2022 include:

- a significant decrease in the fugitive GHG emissions of oil and natural gas systems (CRT 1B2, -62%), in particular due to the downfall of flaring in refineries,
- a considerable decrease of CO_2 and N_2O emissions of the chemical industry (CRT 2B, -78% in CO_2e), in particular following the shutdown of ammonia and nitric acid plants, compensated by the increase in CO_2 emissions from iron and steel production (CRT 2C1, +81%),
- the important increase in CO_2 emissions from the use of urea in agriculture (CRT 3H, +574%), accompanied with the significant increase in direct N_2O emissions related to application of inorganic fertilizers (CRT 3.D.1.1, +598%), but which do not compensate in CO_2e the decrease in CH_4 emissions of the enteric fermentation (CRT 3A, -44%) for the global agriculture sector (-25% in CO_2e),
- the large increase of the negative emissions of CO_2 of the LULUCF sector, which more-than-tripled between 1990 and 2022 (+222%), mostly due to the growing forest (CRT 4A, +133%).

In 2022, the CO_2 balance for LULUCF is a net removal which represents more than 7% of the total GHG emissions without LULUCF contribution, expressed as CO_2 equivalent (i.e., 4.5 Mt CO_2e).

2.4 Other information - indirect GHGs

For the indirect emissions the SEPA is using inventory system for Air Pollutants established and maintained under the Convention on Long Range transboundary pollution. This system is sharing activity data with GHG Inventory system where applicable and building on EMEP methodology and emission factors.

Between 1990 and 2022, there was a downward trend in mass emissions of the four gases which indirectly contribute to the greenhouse effect: 70.2% for sulphur dioxide, 43.9% for carbon monoxide, 45.1% for nitrogen oxide and 29,8% for NMVOC.

Table 4: Summary GHG emission table in accordance with paragraph 91 of the Decision 18/CMA.1

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions/ removals	CH_4	N_2O	HFCs [1]	PFCs [1]	Unspecified mix of HFCs and PFCs [1]	SF_6	NF_3	Total GHG emissions/removals [2]
	(kt)			CO_2 equivalents (kt) [3]			(kt)		CO_2 equivalents (kt) [3]
Total national emissions and removals	**46.875,51**	**311,36**	**8,36**	**83,21**	**NA**		**1,82**		**58.022,66**
1. Energy	**46.313,09**	**96,19**	**1,21**						**49.327,58**
1.A. Fuel combustion	46.288,13	20,53	1,21						**47.184,31**
1.A.1. Energy industries	31.971,63	0,36	0,40						**32.086,91**
1.A.2. Manufacturing industries and construction	3.566,62	0,34	0,05						**3.590,09**
1.A.3. Transport	8.020,39	1,35	0,41						**8.167,13**
1.A.4. Other sectors	2.729,49	18,49	0,35						**3.340,18**
1.A.5. Other	-	-	-						-
1.B. Fugitive emissions from fuels	24,96	75,65	0,00						**2.143,27**
1.B.1. Solid fuels	-	35,14	-						**983,81**
1.B.2. Oil and natural gas and other emissions from energy production	24,96	40,52	0,00						**1.159,46**
1.C. CO_2 Transport and storage	-								-
2. Industrial processes and product use	**4.915,83**	**0,45**	**-**	**83,21**	**NA**	**NA**	**1,82**		**5.141,14**
2.A. Mineral industry	1.538,30								**1.538,30**
2.B. Chemical industry	290,40	0,45	-	-	NA	NA	-		**302,96**
2.C. Metal industry	2.995,44	0,00	-	-	NA	NA	1,82		**3.038,19**
2.D. Non-energy products from fuels and solvent use	91,70	-	-						**91,70**
2.E. Electronic industry				-	NA	BA	-		-
2.F. Product uses as substitutes for ODS				83,21	NO	NA	-		**161,47**
2.G. Other product manufacture and use	-	-	-	-	NE	NA	0,36		**8,53**
2.H. Other [4]	-	-	-	-	NA	NA	-		-
3. Agriculture	**216,84**	**102,34**	**6,78**						**4.878,68**
3.A. Enteric fermentation		81,16							**2.272,44**
3.B. Manure management		18,33	1,30						**857,03**
3.C. Rice cultivation		-							-
3.D. Agricultural soils		-	5,41						**1.432,83**
3.E. Prescribed burning of savannahs		-	-						-
3.F. Field burning of agricultural residues		2,85	0,07						**99,54**
3.G. Liming	-								-
3.H. Urea application	216,84								**216,84**
3.I. Other carbon-containing fertilizers	-								-
3.J. Other	-	-	-						-
4. Land use, land-use change and forestry [5]	**- 4.570,26**	**0,20**	**0,06**						**- 4.548,89**
4.A. Forest land [5]	- 4.686,65	0,16	0,01						**- 4.679,77**
4.B. Cropland [5]	46,42	-	0,01						**49,43**
4.C. Grassland [5]	1,48	0,04	0,00						**3,71**
4.D. Wetlands [5]	66,93	-	0,01						**70,81**
4.E. Settlements [5]	147,39	-	0,01						**150,18**
4.F. Other land [5]	100,66	-	0,01						**103,24**
4.G. Harvested wood products [5]	- 246,49								**- 246,49**
4.H. Other [5]	-	-	-						-
5. Waste	**-**	**112,18**	**0,31**						**3.224,17**
5.A. Solid waste disposal [6]		**86,88**							**2.432,68**
5.B. Biological treatment of solid waste		-	-						-
5.C. Incineration and open burning of waste [6]	-	-	-						-
5.D. Wastewater treatment and discharge		25,30	0,31						791,49
5.E. Other [6]	-	-	-						-
6. Other ***(please specify)*** [7]	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**0**
Memo items: [8]									
1.D.1. International bunkers	**452**	**0**	**0**						**451,69**
1.D.1.a. Aviation	452	0	0						**451,69**
1.D.1.b. Navigation	NA	NA	NA						**NA**
1.D.2. Multilateral operations	**NA**	**NA**	**NA**						**NA**
1.D.3. CO_2 emissions from biomass	**7.711,35**								**7.711,35**
1.D.4. CO_2 captured	**0**								-
5.F.1. Long-term storage of C in waste disposal sites	**586,20**								**586,20**
Indirect N_2O									-
Indirect CO_2	NA								**NA**

2.5 Improvements introduced

2.5.1 Improvements and recalculations in BTR1 compared with GHG inventory used for preparation of the NDC

In the period between 2015 and 2022 Serbia's GHG inventory team addressed multiple improvements identified through the multiple internal review process and preparation of other strategic documents. Furthermore, it has to be noted that the NDC target was determined using global warming potentials (GWPs) from 4th IPCC Assessment Report while in the BTR report is prepared using GWPs from 5th IPCC Assessment Report. Most affected sectors due to GWPs are Fugitive emissions, Agriculture and Waste, and to some extent also the IPPU since they have the large share of non-CO2 GHG emissions.

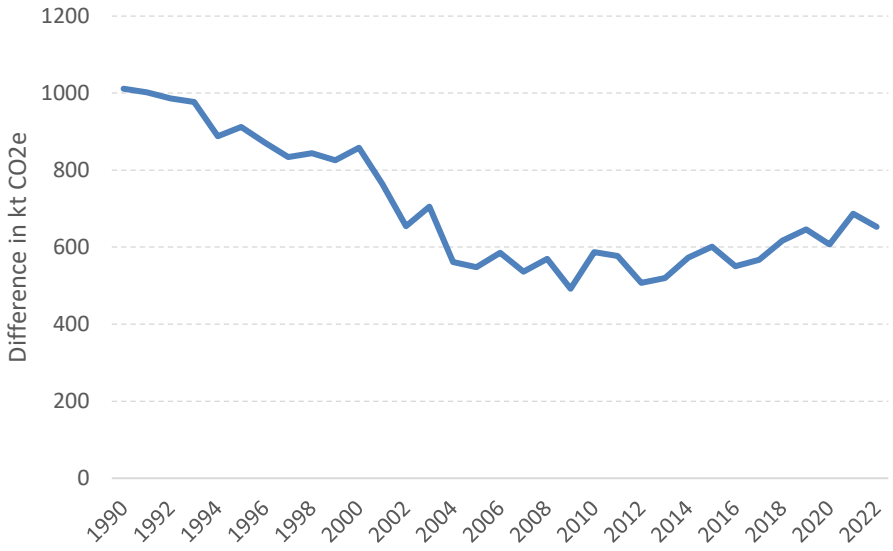


Figure 4: Difference in kt CO2e due to the use AR5 GWP (compared to AR4)

In addition to the effects of the updated GWP values the GHG inventory was since 2015 improved mainly in Waste, Agriculture sector and Fugitive emissions. The improvements were applied to the whole time series 1990-2022.The overall effect on the NDC base year and the period up to 2015 is presented in the diagram below. Since the GHG inventory without improvements is not available after the improvements have been implemented the differences due to improvements are presented oly for the period 1990-2015.

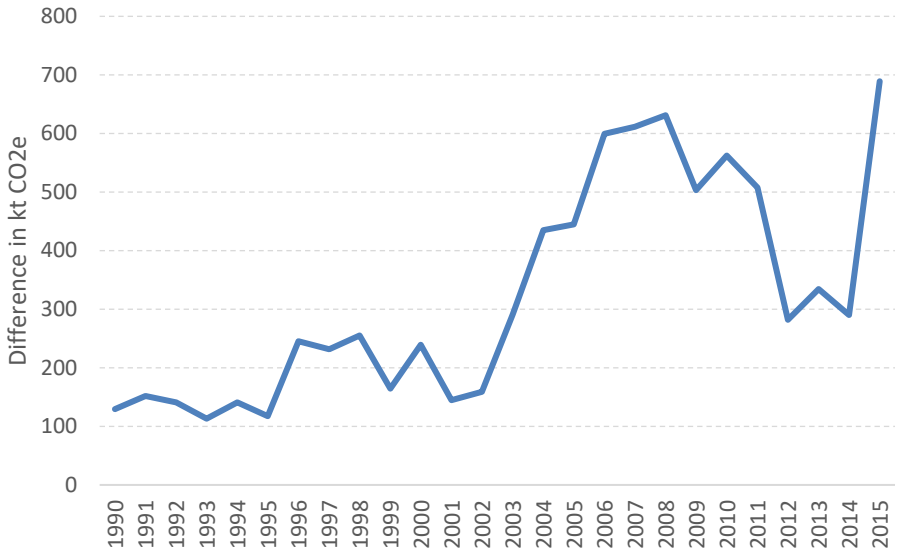


Figure 5: Change in the NDC base year and the period up to 2015 due to GHG Inventory improvement

It can be noted that improvements in the GHG inventory estimates have rather minimal effect in the 1990 while in more recent years the effects of the improvements are increasing. It is estimated that by 2030 those improvements introduced after the determination of the NDC reduction target could result in additional 1,2Miot CO2e of emissions which should be taken into account when assessing compliance with the NDC target.

Overall effects of all improvements and recalculations are presented in the table below. Please note that the differences between Energy industry and Manufacturing industry and Construction is mainly due to proper allocation of emissions from self-producers.

Table 5: Comparison of the GHG Inventory Used in the BTR1 Report and for NDC Preparation in kt CO2e

	1990	2010	2015
Energy Industry	-1.433	-1.200	-585
Manufacturing Industry and construction	1.415	1.226	786
Transport	-4	-14	4
Other sectors	38	29	27
Fugitive emissions	280	245	268
IPPU	61	312	196
Agriculture	352	247	292
Waste	432	304	303
Total	**1.141**	**1.149**	**1.292**

It can be observed that the overall effect of the improvements and recalculations is at the level of 1,1-1,3MiotCO2e which represents around 1,3% of overall emissions in 1990 and 2% of overall GHG emissions in 2015. Due to expected further decline in combustion emissions which mainly contribute to the CO2 emissions, the effects of non-CO2 improvements and recalculations is expected to further grow by 2030.

3 Information necessary to track progress made in implementing and achieving NDC

3.1 National circumstances and institutional arrangements

Government structure
Serbia operates as a parliamentary republic with a government structure that divides powers among the executive, legislative, and judicial branches, as outlined in its Constitution. Here's an extensive breakdown of each component:

1. Executive Branch

The candidate for the Prime Minister is proposed to the National Assembly by the President of the Republic, and the election of the Prime Minister is decided by the National Assembly. The President of the Government leads and directs the work of the Government. Out of 25 ministries, only 9 are headed by women.

2. Legislative Branch
Serbia's National Assembly is a unicameral legislature with 250 members elected for four-year terms through a proportional representation system. . The gender structure of the parliament consists of 94 (37.6%) female and 156 (62.4%) male MPs. As the main legislative body, it enacts laws, approves the budget, and elects the government. It also has the power to ratify international treaties and amend the Constitution.

3. Judicial Branch
The judicial system is independent, and the highest court in the Republic of Serbia is the Supreme Court. In addition, there are various regular courts and the state prosecutor's office that deal with civil and criminal cases.

3.1.1 Population profile

Population trend

Serbia's population is currently estimated at around 6.7 million people in 2022 down from around 7.5 million in 1990, continuing a trend of decline due to factors such as a low birth rate, high mortality rate, and emigration.

According to the 2022 population census, women outnumber men in total population for almost 3% (51.4% women and 48.6% men). According to the estimate, at the end of 2023 there were 1,150,050 children, which is about 17% of the total population. Also, life expectancy for women is 5 years longer than for men (78.1 years for women and 73.0 years for men) 16.

[16] Women and Men in Serbia, 2020- https://www.stat.gov.rs/media/5806/zim-u-rs-2020_webopt.pdf

Serbia's population density stands at about 92 people per square kilometre, with most residents living in urban areas, particularly in Belgrade, the capital, which houses over 1.6 million inhabitants. Other major cities include Novi Sad, Niš, and Kragujevac. Depopulation is present in 95% of settlements (4,429 settlements have fewer populations than in 2011). Depopulation is connected with accelerated ageing.[17]

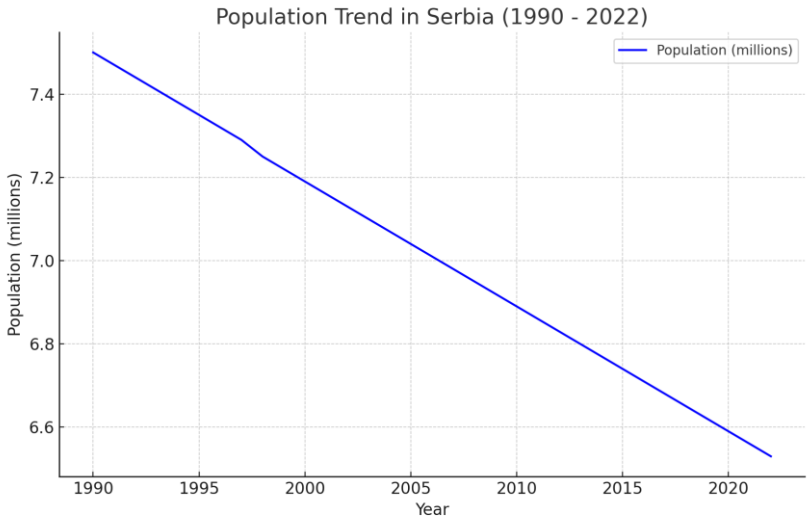


Figure 6: Population trend in Serbia in the period 1990 2022

Fertility Rate Trend

The total fertility rate (TFR) in Serbia dropped sharply from around 2.1 in 1990 to approximately 1.5 by 2022, well below the replacement level of 2.1. This decline in fertility reflects both economic conditions and changing societal values. Fertility rates differ across regions, with lower rates observed in urban areas compared to less urbanized regions[18].

[17] Marinkovic, I. (2024). Age-sex structure and depopulation in Serbia: 2002-2022. *Zbornik Matice srpske za drustvene nauke*, *189*, 69–80. https://doi.org/10.2298/ZMSDN2489069M

[18] Demographic Yearbook, 2022

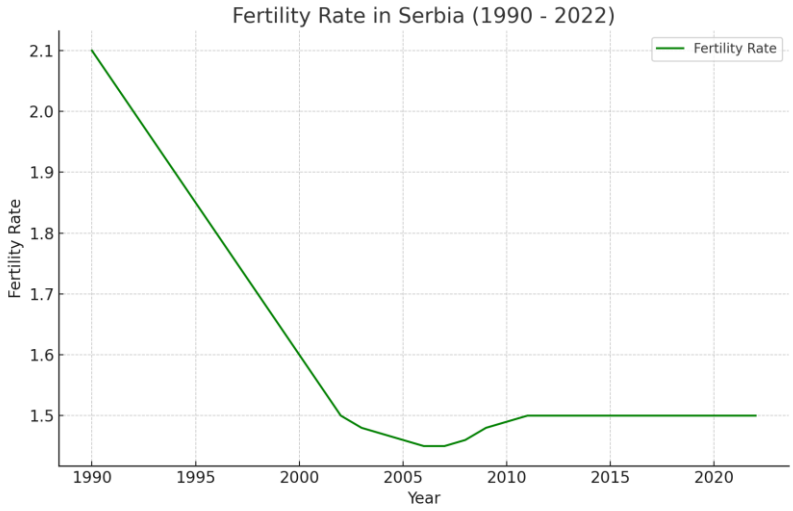


Figure 7: Average number of children per women in Serbia in the period 1990 2022

Live Births vs Deaths

The live births in Serbia have been steadily decreasing, from approximately 97,000 in 1990 to about 35,000 in 2022. On the other hand, the number of deaths has increased over the same period, surpassing the number of live births in the early 2000s. This natural decrease in population highlights Serbia's demographic challenges.

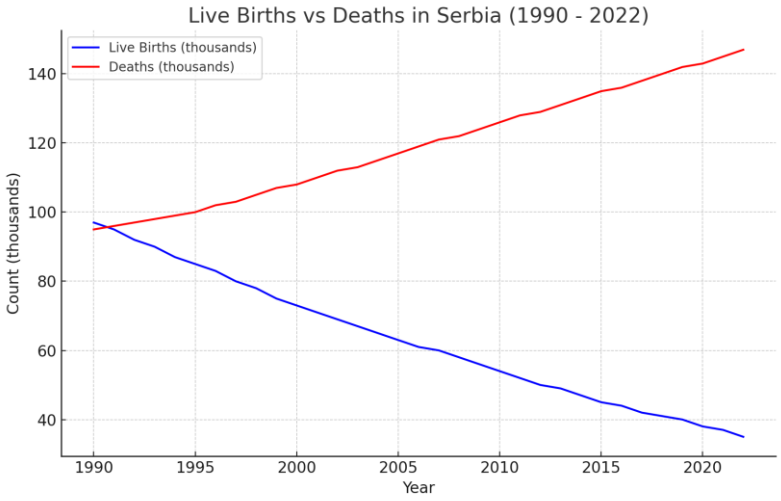


Figure 8: disparity between deaths and live births in Serbia in the period 1990 2022

Age Distribution (65+)

Serbia's population is aging significantly. In 2022, about 20% of the population was over 65, compared to about 10% in 1990. The youth population (0-14 years) has been steadily decreasing, representing only around 15% by 2022. The mean age of the population has been increasing, reflecting this shift towards an older age structure.

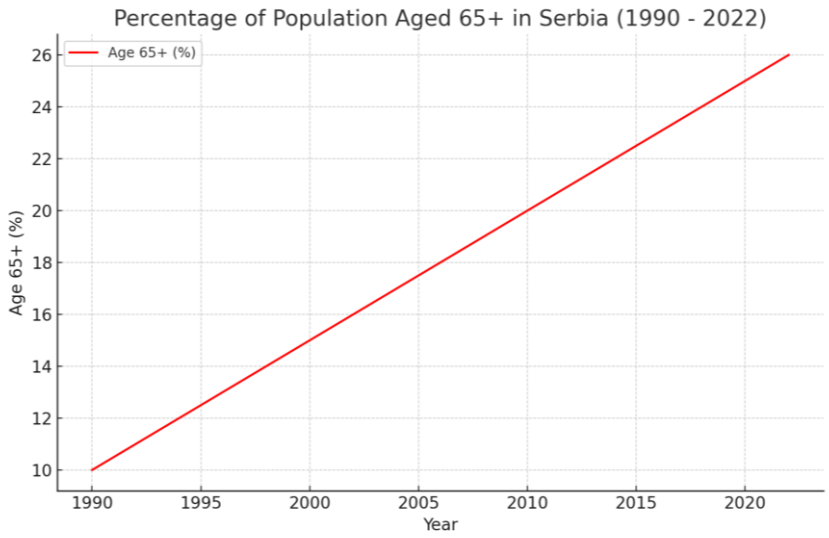


Figure 9: Evolution of the share of population older than 65 in Serbia in period 1990-2022

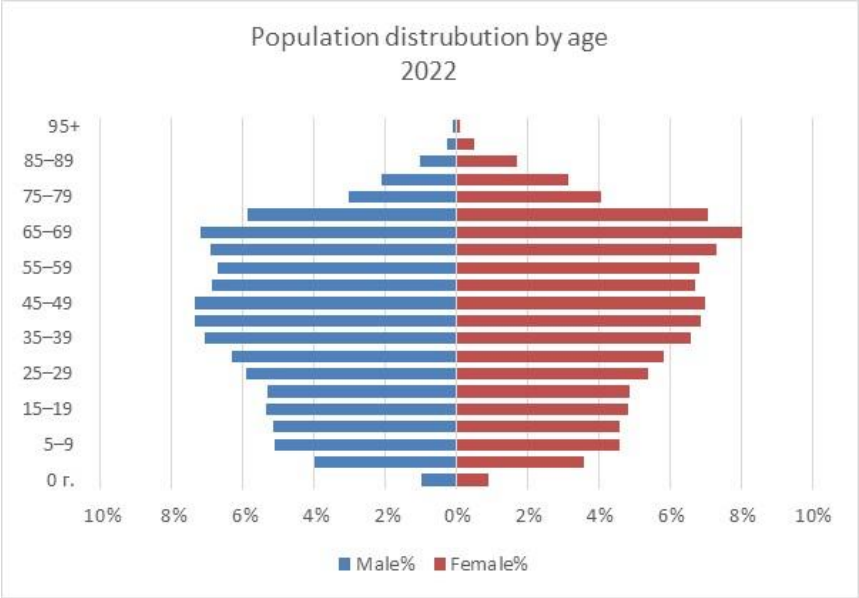


Figure 10: Population distribution by age in Serbia in 2022

The most residents in Serbia finished high school – 53.1 percent with nearly equal percentage of girls (49.8%) and boys (50.2%). Only 17.8 percent completed primary school, 22.4 percent completed higher education, and 6.3 percent did not complete primary school. However, gender segregation by area of education is rising, as measured by the participation of women in social sciences and humanities compared to men's participation in science, technology, engineering, and mathematics (STEM)[19].

In the period between the two censuses significantly increased the number of people with higher education – from 16.24 in 2011, to 22.44 per cent in 2022. According to statistical data, girls and young women are more successful than boys and young men in education at all levels. Women comprise the majority of PhD holders and those who have finished tertiary education. Percentages of people older than 15 years without primary education completion decreased in more than half from 13.68% in 2011, to 6.3% in 2022. The results of the

[19] Gender Equality Index for Serbia, 2021

2022 Census indicate that there are much more illiterate women than illiterate men (71% to 29%). More than half of the illiterates women are aged 65 and over.

Computer literacy

Out of 5,691,551 residents older than 15 years, 45.73% are computer literate, 29.62% are partially computer literate, while 24.19% are not computer illiterate.

These insights demonstrate that Serbia faces critical demographic challenges, including an aging population, low fertility rates, and high emigration, all contributing to the nation's overall population decline.

3.1.2 Geographical profile

Serbia is a landlocked country located in Southeast Europe. 75% of the territory belongs to the Balkan Peninsula, and 25% to Central Europe, occupying a total area of 88,499 km^2. In terms of area, it ranks 113th in the world.

Serbia is bordered by seven countries: Hungary to the north, Romania to the northeast, Bulgaria to the southeast, North Macedonia to the south, Croatia and Bosnia and Herzegovina to the west, Montenegro to the southwest.

Serbia's geographical diversity shapes its economy, climate, and way of life, making it a vital part of the Balkan Peninsula.

Serbia is relative rich in water resources, with the Danube, Sava, and Great Morava rivers being the most significant.

The Danube, which is the longest river in Serbia, flowing for 588 kilometres through the country is one of the most important rivers in Europe, stretching across 10 countries. In Serbia, it serves as a crucial waterway for transportation, trade, agriculture, and tourism. The river links Serbia to the Black Sea, enhancing its strategic importance for commerce. The river passes through key cities such as Belgrade, Novi Sad, and Smederevo, making it a focal point for economic activities.

Forest Cover

Forests cover approximately 39.01% of Serbia's total land area, equating to about 2.85 million hectares. These forests include both state-owned and privately-owned areas, with around 41.73% under state ownership and 58.27% privately owned.

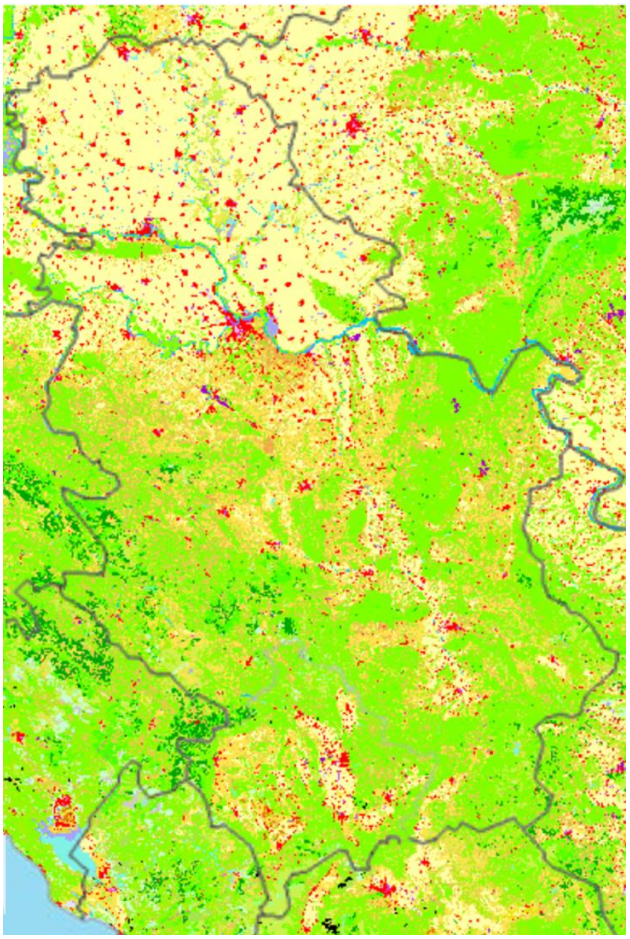


Figure 11: Corine Land Cover, Serbia 2022

Economic profile

In 2022, Serbia's economy showed resilient growth despite global economic challenges. The macroeconomic indicators reflect steady progress in several sectors, with significant improvements in key areas such as GDP growth, inflation control, and labour market stability.
The economy consists of: banking and insurance; wood industry; energy; construction industry; creative industry; chemistry, pharmacy, rubber and non-metals; IT; utilities; metal and electrical industry; agriculture; mining, metal processing and metallurgy; transportation; textile and leather; trade; tourism and hospitality, and private security.

GDP levels

The Gross domestic product (GDP) was in 2022 nominally higher by 11.6% compared to the previous year, and in real terms it increased by 2.5%. When observed by economic activity, the most relevant stakeholders in GDP formation in 2023 were the process manufacturing industry sector with 14.0%, wholesale and retail trade and servicing of motor vehicles with 10.5% followed by the IT and communication with 7.5%, the real estate sector with 6.9%, professional, scientific and technical activities with 5.2%, agriculture with 6.0%, and Public Administration and Defence with 4.6%.

Real GDP Growth

Serbia's real GDP growth in 2022 was reported at **2.5%**, maintaining the growth rate from the previous year, despite facing external challenges such as rising energy costs and global supply chain disruptions. This steady growth rate indicates a stable economy, supported by strong performances in agriculture, construction, and energy.

Unemployment and Labor Market

The unemployment rate continued its downward trajectory in 2022, stabilizing at **9.0%**. Both male and female incumbents in female-dominated occupations earn significantly less than their counterparts in male-dominated fields. The employment rate of women is 43.2%, which is 14.7 % less than the employment rate of men (57.9%).

External Trade

Exports of goods and services grew by **31.9%** in 2023, totalling **€38.0 billion**, while imports increased by **34.7%**, reaching **€45.1 billion**. Serbia's trade balance remained negative, and slightly widening of the trade deficit reflected a stronger import sector, particularly in energy sector.
The most significant macroeconomic indicators for the period 2010 - 2023 are shown in Table 6:

Table 6: Key macroeconomic indicators

	2010	2015	2020	2021	2022
Real GDP growth (in %)[1)]	0.7	1.8	-0.9	7.7	2.5
Consumer prices (in %, relative to the same month a year earlier)[2)]	10.3	1.5	1.3	7.9	15.1
NBS foreign exchange reserves (in EUR million)	10.002	10.378	13.492	16.455	19.416
Exports (in EUR million)[3)]	9.515	15.728	22.271	28.818	38.004
- growth rate in % compared to a year earlier	18.3	8.8	-4.6	29.4	31.9
Imports (in EUR million)[3)]	14.244	18.643	26.370	33.439	45.054
- growth rate in % compared to a year earlier	8.7	3.0	-5.7	26.8	34.7
Current account balance[3)]					
(in EUR million)	-2.037	-1.234	-1.929	-2.266	-4.162
as % of GDP	-6.5	-3.5	-4.1	-4.2	-6.9
Unemployment according to the Survey (in %)[6)]	20.9	18.9	9.7	11.1	9.5
Wages (average for the period, in EUR)[7)]	331.8	367.9	510.9	560.2	637.9
RS budget deficit / surplus (in % of GDP)[4)]	-3.2	-2.7	-8.3	-4.6	-3.3
Consolidated fiscal result (in % of GDP)[4)]	-4.3	-3.5	-8.0	-4.1	-3.2
RS public debt, (central government, in % of GDP)[8)]	39.5	70.0	57.0	56.5	55.1
RSD/USD exchange rate (period average)	77.91	108.85	103.03	99.49	111.86
RSD/USD exchange rate (end of period)	79.28	111.25	95.66	103.93	110.15
RSD/EUR exchange rate (period average)	103.04	120.73	117.58	117.57	117.46
RSD/EUR exchange rate (end of period)	105,50	121,63	117,58	117,58	117,32
GDP (in EUR million)[5)]	31.546	35.740	46.815	53.345	60.427

[1)] At constant prices of previous year.
[2)] Retail prices until 2006.
[3)] Starting from 2007 data on balance of payments (current account, exports and imports of goods and services) are shown in accordance with BPM6. Data for 2005 and 2006 are shown according to the previous methodology. Due to the break in the series for 2007, exports and imports growth rates are not shown. Starting 2007 the general trade system of registration of exports and imports is applied. This is a broader concept and includes all goods entering/exiting country's economic territory, apart from goods in transit. Data for 2005 and 2006 are disseminated using the special trade system.
[4)] Includes below-the-line items (payment of called guarantees, bank recapitalisations and debt takeover) in line with IMF methodology, as of 2008 on RS budget level and as of 2005 on consolidated level.

[5)] According to ESA 2010.
[6)] In 2024, Statistical Office Republic of Serbia (SORS) conducted a post-census revision of data for the period 2021 - 2022. Data series is given according to the methodology of the 2021 Labor Force Survey (LFS).
[7)] Until 2018, wages are shown according to the old methodology. Since 2018, wages are shown according to the new methodology and data are based on Tax Administration evidence. For conversion of wages from RSD to EUR, we used the average of the period RSD/EUR exchange rate.
[8)] Data on the share of public debt in GDP were downloaded from the website of the Ministry of Finance.

Risk of poverty

In 2022 **at-risk-of-poverty rate** was **20.0%**, which is less by 1.2% compared to 2021. The at-risk-of-poverty or social exclusion rate was 28.1%, which is 0.3% lower compared to 2021.

Table 7: Key gender equality indicators

Population	
Population total (population census 2022)[20]	Total 6,647,003 Women: 51.4% Men: 48.6%
Population change rate 2022[21]	-6.6
Life expectancy at birth, 2021[22]	Women: 75.64 Men: 69.96
Economy	
Activity rate, population 15+, 2022	Total: 55.5% Women: 47.9% Men: 63.6%
Employment rate, population 15+, 2022[23]	Total: 50.3% Women: 43.2% Men: 57.9%
Gender Equality Indexes	
Gender Development Index, 2021/2022[24]	0.982
Gender Inequality Index, 2021/2022[25]	0.131
Gender Equality Index 2021[26]	58.0/100
Global Gender Gap Index 2024[27]	0.779/26

3.1.3 Climate profile

Serbia's climate is predominantly moderate-continental, but local variations occur due to influences from its geographical position, including proximity to the Alps, the Mediterranean Sea and the Pannonian Plain.

[20] Statistical Office of the Republic of Serbia. 2021. Census Data https://popis2022.stat.gov.rs/sr-Latn
[21] Statistical Office of the Republic of Serbia. 2023. Crude rate of total population change https://data.stat.gov.rs/Home/Result/180701?languageCode=sr-Cyrl
[22] Statistical Office of the Republic of Serbia, Demographic Yearbook, 2022, p. 33, https://publikacije.stat.gov.rs/G2022/Pdf/G202214019.pdf
[23] Statistical Office of the Republic of Serbia, 2022. *Labour Force Survey.* https://publikacije.stat.gov.rs/G2023/Pdf/G20235695.pdf
[24] Ibid, p. 287
[25] Ibid, p. 292
[26] Gender Equality Index. 2021. Belgrade: Social Inclusion and Poverty Reduction Unit of the Government of the Republic of Serbia https://socijalnoukljucivanje.gov.rs/wp-content/uploads/2021/10/Gender_Equality_Index_for_the_Republic_of_Serbia_2021.pdf
[27] World Economic Forum. 2024. Global Gender Gap Report. Serbia. p. 313-314

In the mountainous regions, the mean annual temperature is as low as about 4°C for Kopaonik Mountain, while urban areas like Belgrade report averages above 13°C. January is typically the coldest month, while July marks the peak of summer with averages up to 23.8°C in Belgrade and 13.2°C for Kopaonik. The hottest day on record was in Smederevska Palanka, 44.9°C in 2007, and the coldest was observed in Karajukića Bunari, -39.5°C in 1987. Summers are hot and temperatures often exceeds 30°C, particularly in southern regions like Niš, which recorded an average of above 50 such days annually.

Serbia follows a continental precipitation regime, meaning that most of the rainfall occurs during the warmer months. Precipitation also varies significantly by location and altitude. Annual precipitation ranges from about 570 mm in area around Kikinda to over 1,000 mm in Zlatibor Mountain. The highest monthly precipitation often occurs in May or June. However, some regions, such as Vranje and Negotin have a second precipitation maximum in November or December. The number of precipitation days also varies, for example Zlatibor has up to 167 days annually, compared to 117 days in Negotin. In the mountains region winter can be with frequent snowfall. Kopaonik mountain have about 90 days of snow cover per year.

Climate trends in Serbia indicate a gradual increase in average temperatures and more frequent extreme weather events. Over recent decades, Serbia has experienced hotter summers and milder winters. Droughts and heatwaves are becoming more common, particularly impacting agriculture, and water resources. Conversely, the frequency of intense rainfall events has led to destructive floods, such as those in 2014. Future climate projections suggest further temperature increases by the end of the century, accompanied by a shift in precipitation patterns, with wetter winters and drier summers expected. More details about current climate trends and future climate projections with expected impacts are given in the National Adaptation Programme. In addition, detailed information on climate, climate trends and future projections can be found on Digital climate atlas platform www.atlas-klime.eko.gov.rs.

Hydrology and Water Resources

Serbia is a very water-stressed country, facing several challenges such as: very unfavourable spatial availability (the areas that have the greatest need for water are also experiencing the most scarcity), unfavourable time distribution of water (among the most unfavourable in Europe) which practically prevents the use of water without accumulation and a small share of surface and groundwater resources with water resource characteristics. This situation is further exacerbated by observed and expected climate change.

From the territory of the Republic of Serbia, the waters gravitate towards the Black Sea (over 92.5%), the Adriatic Sea and the Aegean Sea. The Danube is the longest river and its course through Serbia is 588 km long (of its 2,783 km).

Groundwater is the primary source of water supply for approximately 70% of the population of Serbia. In 2023 about 83% of the population connected to public water supply systems. In the same year, 24% of the public water supply in urban settlements was physically and/or chemically contaminated, while 23% of public water supply lines indicated microbiological water contamination.

As of 2023 almost 75% of the population lives in settlements with more than 2,000 inhabitants, where the average level of connection to public sewerage system is about 73%, while approximately 27% have individual sewerage systems (septic tanks). In settlements with less than 2,000 inhabitants, the connection to public sewerage systems is less than 5%. Less than 11% of the population has access to some form of wastewater treatment. Wastewater is primarily generated by households (67%), of which only 14.1% undergoes treatment, and 19% from industry. Approximately 55% of industrial plants lack wastewater treatment, and around 48% of industrial wastewater samples do not meet the required wastewater quality standards.

A large part of the territory is endangered by floods, the risk of potential flooding also exists where protective systems have been built. The most severe situations occur in the basins of smaller watercourses. Erosion processes threaten approximately 90% of the state territory. The most common is very weak erosion (category B) affecting about 48% of the surface. The basins of Pčinja and Dragovištica are the most endangered by erosion, as along with the basin of South Morava, while the area of Vojvodina is the least threatened. The increased effects of climate change have implications that contribute to women's increased vulnerability. Women's productive and reproductive roles in the household and community are impacted by floods, droughts, cold and heat waves, cyclones and hurricanes, higher average temperatures, forest fires and rising sea levels. Several studies have shown that women are more vulnerable during different periods of climate change-induced disaster. A survey of the gender dimension of natural disasters, based on data from 141 countries, found that women are the dominant victims of natural disasters, especially younger women in poorer communities.

The 2014 floods were among the worst natural disasters in Serbia's recent history. Heavy rains caused the rivers Sava, Kolubara, Drina, and others to overflow, leading to widespread devastation across Serbia and neighbouring countries (Bosnia and Croatia). More than 50 people lost their lives, and tens of thousands were evacuated. Research on the role of gender in preparedness and response during floods showed that women were particularly affected because they were underrepresented in flood response planning and overall process decision-making, including the perception of men's better individual and household preparedness to respond to floods. At the same time, women volunteered more and provided economic support to flood victims. [28]
Large areas of land were submerged, and infrastructure, including homes, roads, and bridges, was severely damaged. The floods caused an estimated €1.5 billion in damages, affecting agriculture, energy, and housing sectors. Critical power plants, such as the Nikola Tesla power plants (TENT-A and TENT-B), were heavily impacted since the surface lignite mine Kolubara was completely submerged.
The Republic of Serbia's Water Management Strategy for the period up to 2034 identifies climate change as a significant factor in the field of water management, particularly in terms of maintaining the water regime, especially in the future as an increase in the frequency of flood events and arid periods is expected as a consequences of changing temperature and precipitation regimes.

[28] Baćanović, V. (2014). Rodna analiza uticaja poplava u Srbiji u 2014. godini. [Gender Analysis of Floods in Serbia] Organization for Security and Cooperation in Europe.

3.2 Sector details

3.2.1 Energy Sector

The energy sector comprises of the oil and gas industry, coal mines, the electric power system, the decentralized district heating system and industrial energy. “Elektroprivreda Srbije” Joint Stock Company (Electric Power Industry of Serbia - EPS) owns most of Serbia’s energy production infrastructure, while the electricity transmission system is operated by the company "Elektromreža Srbije" Public Enterprise (EMS). In 2022, 35.5 billion kWh of electricity was produced, while 28.98 TWh were consumed.

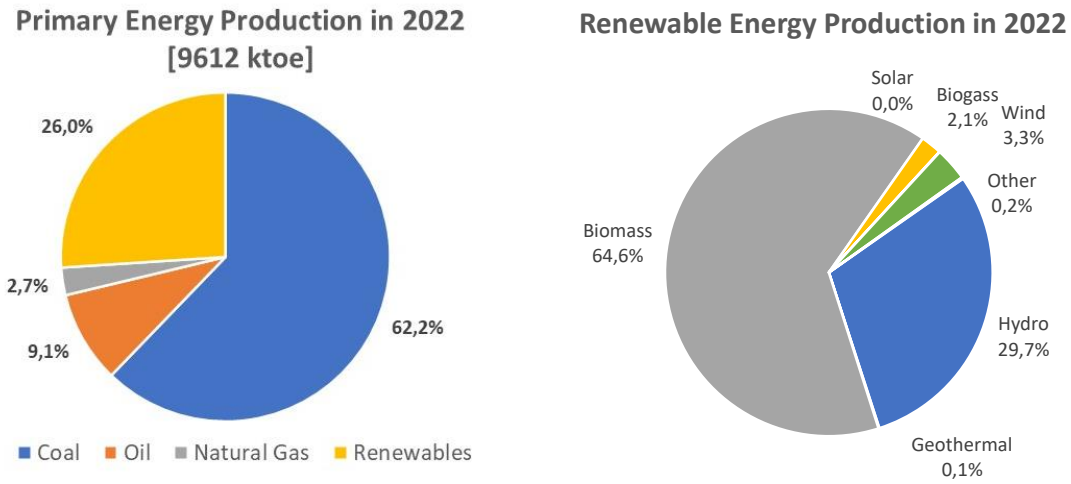


Figure 12: Primary energy generation structure and renewable energy production in the Republic of Serbia in 2022

Most of the electricity was produced by thermal power plants (66% of all electricity), 26% by hydro power plants, 2.7% by wind power plants, with the rest generated by thermal power plants, thermal power stations and other electricity generation capacities. In 2022, natural gas power plants generated 142 GWh of electricity from highly efficient cogeneration, and industrial power plants generated 480 GWh. Transmission and distribution losses amounted to 4,182 GWh in 2022. Primary energy production was 9,612 Mtoe. The primary energy generation structure is presented in Figure 12: Primary energy generation structure and renewable energy production in the Republic of Serbia in 2022.

In 2021, the total installed RES capacity was 3,621 MW (including large and pumped-storage hydropower plants), of which was approximately 398 MW installed net capacity from wind power generation. A total of 580.4 MW of RES capacities utilized incentives for electricity generation from RES.

Energy available for consumption in 2022 amounted to 10,086 Mtoe (households and other consumers accounting for 43.7%, transportation for 26.6%, industry for 22.2%, non-energy purposes consumption for 6.2% and agriculture for 1.5%). The structure of final energy consumption by energy sources is as follows: petroleum products contribute 32.2%, electricity 24.7%, renewable sources (predominantly biomass) 16.2%, natural gas 11.2%, thermal energy 7.0% and coal 2.4%. Although the annual electricity generation capacity is on average mostly sufficient, a small quantity of electricity

was exported in 2021 (net export was 2,751 GWh, or 7.7% of total electricity generated). Household electricity consumption in the Republic of Serbia is very high compared to the EU average (+24.4%), mostly due to the use of electricity for heating purposes and a very low level of energy efficiency. Gender norms influence women's and men's participation in energy sector professionals. They also affect women's knowledge and involvement in decision-making at the household and community levels. Energy poverty and money for innovations in business, agriculture, and residence objects are not equally available to men and women since women have fewer resources, knowledge, and time. The energy sector is traditionally male-dominant. In 2019, men comprised 87.1% of the mining employees and 77.3% of the electricity and gas supply employees. They are also prevalent in agriculture and forestry (62.4%). The same gender division in these areas is present in tertiary education.

3.2.2 Industry Sector

The share of industrial production in 2023 contributes to gross domestic product (GDP) approximately 13.3% of GDP. Food production is one of the most important production sectors, contributing to about 19.5% of GDP within the industry.

In the period 2010-2023, industrial activity increased by 26.4%. In the trend two significant downward corrections are observed. One in 2014 when Serbia was affected by major floods which resulted in 15% reduction in industrial activity in electricity and gas sector and as much as 35% reduction in mining and quarrying. It has to be noted that the EU in June 2018 introduced tariffs and quotas for imports of steel as part of its safeguard measures and 2020 was globally affected by the global outbreak of COVID-19. The industry production bounced back in 2021 and stabilised in modest growing trend in the period 2022-2023.

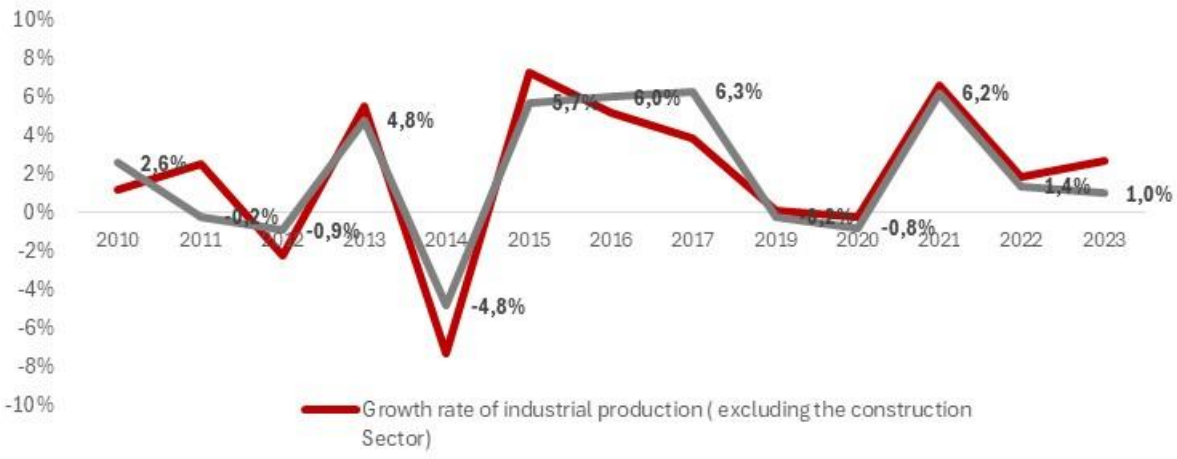


Figure 13: Industrial production and manufacturing industry process growth rates between 2010-2018 (excluding the construction sector)

Industrial production in the Republic of Serbia was higher in 2023 by 2.7% when compared to 2022. When compared to 2020, the volume of industrial production in 2023 increased in 22 areas which make up 89% of industrial production and decreased in 7 areas participating in the industrial production structure with 11%. Observed by sectors and compared to the previous year, the following trends were perceived in 2023: mining sector - 26% growth, manufacturing industry - 2.4% growth, electricity, gas, steam and air conditioning supply - 4.6% growth. The data on industrial

production by product groups in 2023, compared to 2022, indicate that there was a decrease in production of: intermediate goods, except energy (by 0.2%) while an increase was observed in capital goods (by 7.6%), impermanent consumer goods (by 2.4%) and energy (by 4.3%).

3.2.3 Transport

The share of transportation in the gross domestic product was 4.0% in 2023. Transport includes transport by road, rail, water and air. When observed by types of transport, growth in GDP contribution was identified in land transport 7.6%, air transport 13.6% and water transport for 10.3%. In term of physical volume of transport, rail transport in 2022 increased for 3.3%, road transport for 3.5%, transport via pipelines increased for 1.8%, while air transport increased as much as 37.3%, while public transport also increased for 10.8%.
The number of road vehicles in Serbia continued to show a steady increasing trend across all categories (with the exception of mopeds) in 2022 when compared to 2021. Notably, between 2016 and 2022, there has been an increase of 418,038 passenger cars**,** 51,802 light-duty vehicles, and 42,450 heavy-duty vehicles on the roads. This significant growth reflects the expansion of the vehicle fleet across most categories, contributing to a noticeable rise in road traffic volume which is also reflected in increase in congestions in agglomerations across Serbia.

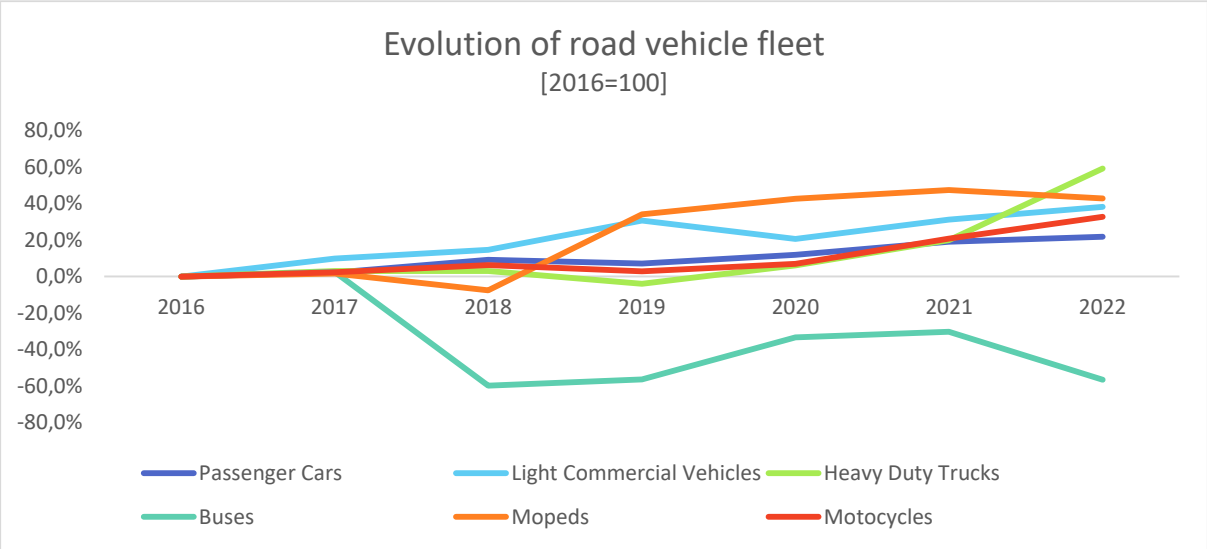


Figure 14: Evolution of number of road vehicles in Serbia I the period 2016-2022

A total of 2,337,498 passenger vehicles, 11,136 buses, and 284,563 freight vehicles were registered in 2022. The country now has approximately 952.7 km of toll highways, expanding beyond the previously mentioned 782 km. Major projects are underway to construct additional expressways and motorways to enhance road connectivity across the nation.
The World Bank study on gender and transport in Serbia found **significant gender inequalities in transport.** Men were found to drive cars and motorcycles more frequently than women (40% of all trips for men, compared to 16% for women); women, on the other hand, were more frequently found as passengers in cars (16% for women compared to 6% of men). Finally, the study found that the transport sector employs predominantly men, who make up 80% of all employees, and women are mainly employed in administrative and professional occupations, men predominantly as drivers and workers. Women are also overrepresented in the public transport sector and men in the private.
The total length of Serbia's railway network is around 3,357.34 km, of which 1,313.26 km are electrified. This electrified portion accounts for approximately 39.12% of the entire network. The

government has been investing heavily in railway modernization, with plans to further upgrade key railway lines, particularly those on international corridors.
The most important inland waterway is the Danube (part of Pan-European Corridor VII). Serbia has three airports with certificates and one with an airport license qualified to perform international air transport, as well as 18 airports with an airport license intended for public air traffic or pilot training, and 7 heliports.

3.2.4 **Agriculture**

The share of agriculture, forestry, and fishery sector in the GDP dropped from 5.3% in 2022 to 3.8% in 2023. The share of crop production in the total value of agricultural plant production equalled 72%, and that of livestock production equalled 28%.
In 2022, Serbia's agricultural land use structure remained largely consistent with previous years. Arable land and gardens continued to account for approximately 75% of the total agricultural land. Orchards covered 5.2%, vineyards made up 0.6%, while permanent grassland and pastures both represented 9.5% each.

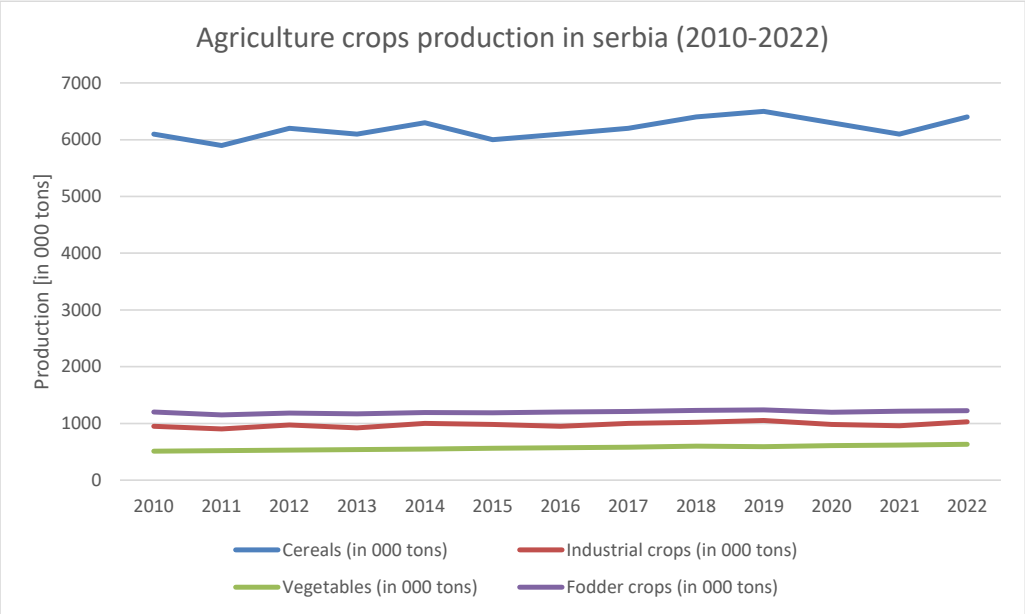


Figure 15: Agriculture crops production in Serbia in the period 2010-2022

Agriculture crops production in last decades is dominated by cereals where production is around 9.4 million tons (varying between 6.3Mt and 11.4Mt), followed by fodder crops with around 1.5 million tons of production, industrial crops with 1.2 million tons, and followed by vegetables with 970 thousand tons.
Regarding vineyards, they are still primarily located at altitudes below 800 meters, organized across 3 regions, 22 zones and 77 winegrowing areas. In the structure of sown arable land, cereals held the majority share with 66.3%, followed by industrial crops at 19.5%, vegetables at 3.1%, and fodder crops at 8.6%, reflecting slight shifts in the share of industrial crops compared to previous years.

According to data from 2018, only 4.6% of the total area of used agricultural land is irrigated. Mineral fertilizers were used at 66.7% of used agricultural land, and 59.8% of it was treated with plant protection products. The majority of farms were small, with 72% being under 5 hectares. Farm ownership was still dominated by older individuals, with 70% of farm owners being over the age of 55, and 43% over the age of 65. The share of organic production is still insufficient. The new agricultural

census 2023 shows that women's position in agriculture is unfavourable—that they own less property and are often invisible as workers. The 2023 census showed that women are only 24% of permanently employed farmers[29].

Land Use Change and Forestry

Land use change in last 20 years, between 2002 and 2022,[30] is presented in Table 8.

Table 8: CORINE Level I changes between 2002 - 2022 (in hectares)

↱	Forest	Cropland	Grassland	Wetland	Settlement	Other land	Initial Area
Forest	2,737,718	601	131	688	4,082	2,240	2,745,460
Cropland	3,142	3,228,240	3,967	1,171	7,980	0	3,244,500
Grassland	2,445	8,270	1,349,320	1,760	2,092	0	1,363,886
Wetland	1,801	489	534	123,906	139	0	126,870
Settlement	3,142	131	536	150	251,217	0	255,177
Other land	1,066	0	0	77	0	20,079	21,222
Final Area	2,749,314	3,237,732	1,354,488	127,752	265,510	22,319	7,757,115

The Spatial Plan of the Republic of Serbia (2010-2020) has identified the optimal forest cover of 41.4%. A total of 2,254,000 ha of land in Serbia are under forests according to the First National Forest Inventory, while, according to the preliminary data of the Second National Forest Inventory, a total of 3,049,502.10 ha of land are under forests which is approximately 39.3% of land. Data of the Second National Forest Inventory show changes in the structure of ownership; while according to the First National Forest Inventory state owned forests dominated over private forests with 53% against 47%, the situation has now reversed and 57.5% of the forests are now privately owned, while 42.5% of them are state owned. Volume of felled timber in forests (by organisations which main activity is forestry) was higher in 2022 than it was in 2021 (+11.4%) and amounted to 3.7 million m^3. On the other hand, afforestation set up new 11,320 ha of forests between 2011-2016, while a total of 1,481 ha was afforested in 2020. The total afforested area in 2021 amounted to 1,203 ha.

Total damage in state-owned forests of the Republic of Serbia in 2022, expressed in wood volume, was 151,178 m^3, of which 23,844 m^3 was man-made damages. The effect of natural disasters (wind, rain, hail and snow) damaged approximately 186,047 m^3 of the wood volume, accounting for approximately 70.3% of all damages in state-owned forests. Moreover, 13 forest fires registered in state-owned forests in 2022, caused damage to 680 m^3 of wood volume. Pest diseases damaged around 11,404 m^3 of wood volume in 2022.

According to the Institute for Nature Conservation of Serbia, there were 669,444 ha of protected areas in 2022, which represented 7.58% of the territory.

Waste Management

The total amount of generated municipal waste in 2022 was 3,101,439 tonnes. Of the total, 444,274 tonnes of materials were recycled, and 11,183 tonnes of waste were subjected to composting and digestion. Additionally, 2,819,629 t (of total generated) waste were disposed of or reused.

Economic activity sectors generated 174.7 million tonnes of waste during 2022 in the Republic of Serbia. A total of 174.3 million tonnes of waste were treated, whereby 6.8% more waste was recycled compared to the previous year.

[29] Agricultural census, 2023

[30] CORINE method used

According to the Waste Management Programme in the Republic of Serbia for the period 2022-2031, the first stage within municipal waste management infrastructure plans involves planning for household composting (30%), primary separation of green waste and its composting at the local level.

It is important to note that in July 2024, the waste-to-energy combined heat and power (CHP) plant located at Belgrade's main solid waste disposal site near Vinča began operations. The plant has a capacity to process 340,000 tons of municipal waste annually. The electricity generated by the facility is expected to cover 5% of Belgrade's electricity demand and 10% of the city's heat demand**.**

Wastewater is one of the main polluters of surface and groundwater, which are natural sources of drinking water. This especially holds true for industrial waste and landfill leachate much of which remain untreated. Wastewater mainly comes from households (67%), much less from the industry (19%), while 14% is generated by other users.

Serbia processes only 5-10% of its wastewater and needs to build 320 wastewater treatment facilities. Wastewater treatment plants exist in 21 municipalities, but even the largest cities discharge their wastewater into rivers.

In 2022, the total amount of wastewater from settlements increased by 2.5% compared to 2021. The quantity of wastewater discharged into public sewage systems grew by 3.5%, while the amount released into septic tanks saw a slight increase compared to the previous year.

When comparing 2022 with 2021, households recorded a 0.4% increase in wastewater discharge into public sewers, while the industrial sector experienced a 4.4% decrease. On the other hand, other users showed a significant increase of 21.3% in wastewater discharge.

In 2022, 2.9% more wastewater was treated than in 2021, with secondary treatment being the most common method. The public sewer network expanded by 2.2%, and the number of new connections to the sewage system increased by 0.7% compared to the previous year.

Serbia's updated *National Plan for the Implementation of the Stockholm Convention on Persistent Organic Pollutants* includes a number of measures and activities aimed at improving gender-disaggregated data, disseminating information among women and especially mothers on the impacts of chemicals and hazardous waste on reproductive health, and strengthening staff capacities through training on gender equality in the area of chemicals management. On the other hand, the data revealed that women are key drivers of current waste separation for recycling (68%) and changing present practices (61%).[31]

3.3 Effect of national circumstances on greenhouse gas emissions/removals

Lignite is Serbia's primary fuel for electricity generation, accounting for around 60-70% of the country's total energy production. These reserves are mainly concentrated in two key coal basins: the Kolubara and Kostolac basins, which together contribute most of Serbia's lignite output. Therefore, Serbia was historically building its energy system around domestic lignite which alone represents around 50% of GHG emissions in Serbia. In term of dependency on coal Serbia is in similar situation as some EU countries, however due to its national circumstances Serbia does not have such investment capacity. Therefore, the decarbonisation in Serbia might be slower than desired and needed. Total system costs for decarbonisation are according to the estimates prepared for the Low carbon development Strategy by 2050 expected to reach over 108 billion€. Despite heavy dependence on domestic coal Serbia is making significant steps in improve energy efficiency and phasing in renewable energy such as solar

[31] Djekic, I., Miloradovic, Z., Djekic, S., & Tomasevic, I. 2019. Household food waste in Serbia – Attitudes, quantities and global warming potential. *Journal of Cleaner Production*, *229*, 44–52. https://doi.org/10.1016/j.jclepro.2019.04.400

and wind since water resources are to a large extend already utilized. In accordance with National Energy and Climate Plan the share of renewable energy in the gross final energy consumption is to by 2030 increase from current 27% to 33.6%, while biomass is already strongly present in rural areas.
Forested land in Serbia serves as a crucial carbon sink, helping to mitigate the effects of climate change. However, the increasing demand for biomass, both for the wood industry and as a fuel source for households, is placing growing pressure on these forests. Climate change is exacerbating this situation by threatening these vital ecosystems through rising temperatures, increased forest diseases, and more frequent wildfires. Over recent decades, Serbia has experienced a significant rise in average temperatures, as evidenced by climate models and historical data. This warming is disrupting the natural growth patterns of forest species, with many struggling to adapt to the changing conditions. In addition, irregular rainfall patterns and prolonged droughts are stressing forest ecosystems, making them more susceptible to diseases, pest infestations, and the risk of fire.
As a result, the annual variations in forest carbon removals are so pronounced that despite efforts, Serbia has been unable to reliably include the Land Use, Land-Use Change, and Forestry (LULUCF) sector in its Nationally Determined Contribution (NDC) targets. These challenges highlight the importance of ongoing reforestation efforts and sustainable forest management to safeguard Serbia's forests against the dual threats of climate change and increased biomass demand.

3.4 Institutional arrangements to track progress in implementing and achieving NDC

Legal and institutional arrangements (for MRV and implementation of NDC)

Legal framework

The Law on climate change regulates the system for the limitation of greenhouse gas emissions (hereinafter: GHG) and for adaptation to changed climatic conditions, monitoring and reporting on the low-carbon development strategy and its improvement, the program of adaptation to changed climatic conditions, the adoption of the low-carbon development strategy and the program of adaptation to changed climatic conditions, the issuance of permits for GHG emissions to the operator of the installations, Issuance of approvals for the aircraft operator's monitoring plan, monitoring, reporting, verification and accreditation of verifiers, administrative fees, oversight and other issues relevant to the limitation of GHG emissions and adaptation to changed climatic conditions.

National GHG inventory system establishes a comprehensive framework for managing and reporting greenhouse gas emissions.

National Entity

Law on Climate Change mandate Environmental Protection Agency as national entity for to establishes and maintains a GHG Inventory system and prepares a relevant GHG Inventory Reports.

In addition to the Law on climate change Serbia developed relevant sub- laws for implementation of the provisions of the Law such as:
Regulation on types of data, bodies and organizations and other natural and legal persons submitting data for the creation of the national GHG inventory identifies the government bodies, organizations, and other entities responsible for providing essential data for the inventory. These data are crucial for compiling GHG emissions from sectors such as energy, transportation, industrial processes, agriculture, land use, forestry, and waste management.

The Environmental Protection Agency (the Agency) is tasked with using data from various sources, including national energy statistics, motor vehicle registers, industrial process reports, and agricultural activities. For example, energy-related data is obtained from international and national statistics, while transportation data comes from the Ministry of Internal Affairs and civil aviation authorities. Industrial and chemical production data is provided by relevant industries and the Statistical Office of Serbia.
The regulation mandates the submission of data on industrial emissions, use of certain products, and agricultural emissions to ensure a comprehensive assessment of GHG contributions from various sectors. Entities engaged in the production of materials like cement, ammonia, and steel are also required to provide emission data.
Additionally, it emphasizes the role of agricultural and forestry data, including information on land use changes. Waste management and water emission data are also necessary, collected from the environmental information systems. The regulation ensures coordination between the Agency and other bodies, formalizing the process through agreements.
This regulation replaces the previous decree on data collection methodology and came into effect in May 2023.
Rulebook on the contents of the national GHG inventory and national report on GHG inventory outlines the content and reporting of the National Greenhouse Gas (GHG) Inventory in Serbia, based on international climate agreements, including the Paris Agreement and guidelines from the Intergovernmental Panel on Climate Change (IPCC). It specifies detailed procedures for collecting data on greenhouse gas emissions, methodologies for calculating emissions and removals, and the necessary transparency and recalculation protocols.
Furthermore, the rulebook requires the GHG Inventory to include emissions from various sectors such as energy production, industrial processes, agriculture, waste management, and land use (including forestry). The inventory follows the IPCC's 2006 and 2019 guidelines and incorporates emission factors and activity data. Special attention is given to ensuring compliance with international standards and Serbia's own laws, particularly regarding air pollution and climate change.
Additionally, the rulebook defines terms such as "key category" and "global warming potential" and others and sets forth procedures for reporting provisional data, as well as for recalculating past inventories when new data or methodologies become available. It mandates the use of national and international indicators to monitor progress and ensure consistency in reporting.

In addition to the legal framework listed above Serbia has in force and implementation legal framework relevant to installations which are according to the Law on Climate change required to obtain GHG Permit, conduct monitoring of its emissions in line with approved monitoring plan and every year verify its emission reports and submit the reports to the Environmental Protection Agency, including:

- Regulation on type of activities and gases with the greenhouse effect;
- Rulebook on monitoring and reporting of GHG emissions;
- Rulebook on the verification and accreditation of verifiers of GHG emissions reports.

Those sub-laws are complemented by additional legal framework established in the context of the Law on Air Protection such as:

- Rulebook on the methodology for the development of national and local register of pollution sources and on the methodology and deadlines for data collection[32];

[32] https://www.paragraf.rs/propisi/pravilnik-metodologiji-izradu-registra-izvora-zagadjivanja.html

- Regulation on fluorinated greenhouse gases management, as well as on conditions for license issuance to import and export of such gases[33].

Administrative and procedural arrangements for MRV and implementation of NDC)

In terms of administrative and procedural arrangements, from an institutional point of view, the Ministry of Environmental Protection (MEP) is the National Focal Point for the UNFCCC Convention. In accordance of Article 58 of the Law on Climate Change, Environmental Protection Agency is in charge to establish and maintain a GHG Inventory system and to prepare a relevant GHG Inventory Reports.
The inventory preparation is under the responsibility of Serbian Environment Protection Agency (SEPA). SEPA undertakes all activities as data collection and preparation of emission reporting, according to CRT nomenclature, and the national GHG inventory report.
The Law on climate change requires from SEPA to develop and implement the Quality Assurance and Data Quality Control (QA/QC) Plan for the purpose of developing and improving the quality of the GHG Inventory. Furthermore, the law requires that the Agency coordinate activities with the authorities and organizations in order to ensure the quality and ensure data quality control in accordance with the plan.
In addition, the law also requires that the bodies and organizations act in accordance with the procedures referred to in the plan and shall inform the Agency of all implemented and planned changes, accompanied by an explanation.

Stakeholders engagement (related to the implementation and achievement of NDC)

In Serbia, the legal framework for stakeholder engagement is horizontally enabled by the constitution and further defined by several key laws and regulations aimed at ensuring transparency, public participation, and consultation. These laws emphasize the need for including a wide range of stakeholders—such as citizens, businesses, non-governmental organizations (NGOs), and public institutions—in the decision-making process.
For the purposes of preparing this report, the MEP established an inter-sectoral working group consisting of 37 members who are representatives of all relevant government institutions from the areas of energy, mining, agriculture, forestry, water management, economy, human and minority rights, internal affairs, foreign affairs, health, science , education, environment, hydrometeorology, statistics, etc., as well as representatives of the economy and local governments.

[33] https://pravno-informacioni-sistem.rs/eli/rep/sgrs/vlada/uredba/2013/120/1

3.5 Description of a Party's nationally determined contribution under Article 4 of the Paris Agreement, including updates

Target(s) and description, including target type(s);

Economy-wide target - reduction of GHG emissions by 2030:
- 13.2 % compared to 2010
- 33.3% compared to 1990

Description: GHG Emissions" refers to Total GHG emissions, excluding LULUCF, as reported in each BTR's National GHG Inventory Reports and CRT tables.

Target year(s) or period(s), and whether they are single-year or multi-year target(s);

Target year for NDC implementation is year 2030 (e.g. single year target)

Reference point(s), level(s), baseline(s), base year(s) or starting point(s), and their respective value(s);

Reference points and its levels:
- year 1990 (82,666,826 tCO2e)
- year 2010 (63,799,990 tCO2e)

Time frame(s) and/or periods for implementation;

Timeframe for NDC implementation is 2021-2023

Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools and gases;

Scope of coverage: All estimated emissions from IPCC sectors and all gases with GWP listed in 5th IPCC Assessment report (CO_2, CH_4, N_2O, HFCs PFCs, SF_6 and NF_3) excluding emissions from LULUCF.

Intention to use cooperative approaches that involve the use of internationally transferred mitigation outcomes under Article 6 towards NDCs under Article 4 of the Paris Agreement;

Serbia has not taken a decision whether it will participate or use cooperative approaches that involve the use of internationally transferred mitigation outcomes under Article 6 towards NDCs under Article 4 of the Paris Agreement.

Any updates or clarifications of previously reported information (e.g. recalculation of previously reported inventory data, or greater detail on methodologies or use of cooperative approaches).

No recalculation of previously reported inventory data or greater detail on methodologies or use of cooperative approaches.

Definitions needed to understand NDC

No specific additional definitions needed to understand the NDC. Definition relevant for the indicator and NDC target is elaborated under following chapters.

Also, there are no additional definitions needed to understand mitigation co-benefits of adaptation actions.

Methodologies used to estimate mitigation co-benefits of adaptation actions and/or economic diversification plans

The Climate Change Adaptation Programme, Serbia's key national policy for guiding adaptation efforts, does not include quantitative estimates for the mitigation co-benefits of adaptation actions or economic diversification strategies. The mitigation co-benefits highlighted in Serbia's latest Nationally Determined Contribution (NDC), submitted in 2022 (Annex B, Table 3: Scope and Coverage), were derived from the draft version of the Third National Communication to the UNFCCC. However, these co-benefits were incorporated into mitigation planning but were not explicitly integrated within the adaptation measures in the same document. Moving forward, the anticipated adaptation reporting, set to begin in 2025 following the implementation of the Climate Change Adaptation Programme, is expected to enhance understanding and provide a more detailed quantification of these mitigation co-benefits within the adaptation framework.

3.6 Information necessary to track progress made in implementing and achieving NDC

Indicator to track progress towards the implementation and achievement of NDC

Taking into account that Serbia's decided to choose absolute emission reduction target by 2030 it will use the following indicator to track NDC implementation.

- **Total GHG emissions [in CO_{2e}]**

Description of the indicator and relation to the NDC

Serbia's primary indicator for tracking its progress toward its Nationally Determined Contribution (NDC) targets is **"total GHG emissions"**, **excluding the Land Use, Land-Use Change, and Forestry (LULUCF) sector**. This indicator measures the aggregate volume of greenhouse gases emitted by all sectors, including Energy, IPPU, Agriculture, and Waste. These emissions are expressed in terms of CO_2-equivalent (CO_2e), enabling the aggregation of different greenhouse gases based on their global warming potential (GWP).

The data for "total GHG emissions" will be drawn from Serbia's **National GHG Inventory Reports**, which are updated annually in line with the IPCC's guidelines. This inventory provides a transparent and comprehensive assessment of the country's emissions profile and is crucial for evaluating progress toward Serbia's 2030 emissions reduction target. Serbia's choice to focus on total GHG emissions ensures that the country can accurately measure and report its overall climate impact, excluding the LULUCF sector, thereby allowing for straightforward tracking of its mitigation efforts across multiple sectors.

Definition needed to understand indicators

"**Total**" = direct GHG emissions from all IPCC sectors excluding GHG emissions from LULUCF

"**GHG emissions**" = all gasses that have listed GWP in IPCC 5th Assessment report

"**[in CO2e]**" = aggregates all gasses expressed as CO_{2e} using the GWP from the IPCC Fifth Assessment Report, using 100-year time horizon metric

Total GHG emissions in CO_2 equivalent refer to the **Total direct GHG emissions (without LULUCF) reported under the ETF.**

Demonstration of relevance

Serbia's decision to use "total GHG emissions" as the primary indicator for tracking its progress toward Nationally Determined Contribution (NDC) targets is both appropriate and consistent with IPCC reporting guidelines. This indicator directly measures the overall volume of greenhouse gases (GHGs) emitted into the atmosphere, providing a clear and quantifiable metric to assess Serbia's efforts in reducing its climate impact.

By selecting a percentage reduction target for 2030 compared to a baseline year (1990 or 2010), the "total GHG emissions" metric allows for straightforward monitoring of national emissions trends. This ensures transparency in tracking progress and compliance with Serbia's NDC commitments under the Paris Agreement. Furthermore, this indicator aligns with IPCC methodologies, where total GHG emissions, excluding LULUCF, serve as a benchmark for determining how well a country is meeting its climate mitigation goals under the UNFCCC.

Given that Serbia's reduction target is expressed as a percentage of emissions relative to a baseline year, using total GHG emissions as the tracking metric allows for easy comparison over time. It enables Serbia to assess whether its climate policies and measures are successfully reducing the emissions from key sectors, including energy, industry, agriculture, and waste, and if they are on the right trajectory

to achieve the NDC target by 2030.

Accounting approach

Serbia's accounting approach for tracking "total GHG emissions" is grounded in internationally recognized principles, specifically those outlined by the Intergovernmental Panel on Climate Change (IPCC) guidelines. These guidelines provide a consistent framework for estimating and reporting emissions, ensuring the integrity and accuracy of Serbia's GHG data.
This accounting system includes:

1. **Comprehensive GHG Coverage:** Serbia accounts for all greenhouse gases (e.g., CO_2, CH_4, N_2O, HFCs, PFCs,SF_6, NF_3) across relevant sectors, providing a holistic view of national emissions.
2. **Consistency with International reporting requirements:** The accounting approach follows IPCC reporting guidelines, ensuring that Serbia's GHG emissions are comparable with those of other countries and meet the transparency requirements of the UNFCCC.
3. **Fixed Baseline Year:** Serbia's NDC target is based on a percentage reduction of total GHG emissions relative to a chosen reference years (1990 or 2010). The accounting approach ensures that this baseline remains consistent and transparent, facilitating accurate progress tracking over time.
4. **Treatment of LULUCF:** Serbia excludes emissions and removals from the Land Use, Land-Use Change, and Forestry (LULUCF) sector.
5. **Accuracy, Transparency, and Verification:** Serbia submits regular GHG inventory reports under the enhanced transparency framework of the UNFCCC. These reports undergo internal QA/QC procedures and subject to the review process under the ETF to verify their accuracy, ensuring the credibility of Serbia's progress toward its NDC.

Through this structured accounting approach, Serbia ensures that its total GHG emissions are accurately reported and tracked in line with global climate commitments. This approach provides a transparent and verifiable basis for assessing the effectiveness of Serbia's climate policies and their contribution to global efforts to limit temperature rise.

Consistency with Article 4 paragraph 13 and 14 of the Paris Agreement

- **Article 4, paragraph 13** requires each Party to "account for its NDCs in a manner that promotes environmental integrity, transparency, accuracy, completeness, comparability, and consistency."

Serbia's accounting approach is consistent with these principles by following established IPCC Guidelines for National Greenhouse Gas Inventories. The approach promotes environmental integrity by ensuring that all significant emissions and removals are accounted for, and promotes transparency and accuracy through detailed GHG inventories that are submitted for international review under the UNFCCC's transparency framework. Moreover, by adhering to IPCC methods, Serbia ensures that its data is comparable with other Parties and consistent over time, allowing for reliable tracking of its emissions reductions.

- **Article 4, paragraph 14** emphasizes the importance of ensuring that accounting approaches do not double-count emissions reductions.

Serbia's accounting approach explicitly avoids double counting by clearly separating emissions from sectors and ensuring that reductions or removals in one sector are not counted twice when assessing overall GHG reductions. The comprehensive GHG inventory system in place, along with the detailed tracking of sectoral emissions, supports this principle by ensuring emissions are reported once and attributed correctly.
As emphasized in the MPGs, the accounting approach must uphold environmental integrity and prevent double counting. Serbia achieves this by adhering to the IPCC's sectoral guidelines and following IPCC rules on how emissions and removals should be allocated. The system ensures that any

emissions reductions are counted once, and any removals (especially from LULUCF) are appropriately tracked and distinguished, preventing over or under estimation of progress toward the NDC.

Consistency with 4/CMA.1

Decision **4/CMA.1** provides further guidance on how Parties should account for their NDCs and outlines key reporting requirements to ensure transparency and accuracy. Serbia's approach aligns with this decision by:

- **Clearly defining the scope** of its NDC accounting, particularly in relation to the inclusion or exclusion of LULUCF and the gases covered. This ensures that Serbia's reporting is transparent and meets the expectations set out in Decision 4/CMA.1.
- **Consistently using the selected baseline year** (1990 or 2010) to assess progress towards its NDC. This ensures the accounting is anchored in a clear reference point, allowing for progress to be tracked consistently over time.
- **Using the IPCC methodologies**, as required by Decision 4/CMA.1, to ensure accuracy in emissions measurement and consistency with international reporting standards.
- **Regular updates and transparency reporting**: Serbia submits regular GHG inventories under the enhanced transparency framework of the UNFCCC, as stipulated by Decision 4/CMA.**1**, ensuring that the international community can assess the country's progress and verify its adherence to its NDC.

3.6.1 Description of each methodology and consistency with NDC

The methodology for preparation of the indicator is the same as the one for the preparation of the NDC target and methodology preparation of GHG inventory for the Republic of Serbia, which is prepared according to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (or where appropriate aligned with 2019 Refinement of the IPCC Guidelines) for emission estimations of greenhouse gases which result from anthropogenic activities: CO_2, CH_4, N_2O, HFCs, PFCs, SF_6 and NF_3. For some subsectors, the IPCC 2019 refinements have been implemented but this is not the case for all subsectors concerned. The emission calculations are developed for each emission source according to the CRT nomenclature.
To calculate the percentage reduction in GHG emissions, Serbia follows a formula that compares current emissions with the emissions in a base year (1990 or 2010), depending on which base year the comparison should refer to. The process involves three key steps:

1. Establish the Base Year Emissions
First, the total GHG emissions in the base year are determined. The baseline year could be either:

- 1990 emissions (used as a policy reference point),
- or 2010 emissions (base year for the NDC).

The total GHG emissions for the baseline year are expressed in CO_2-equivalent (CO_2e), accounting for the global warming potential of different gases.

2. Determine Current or Target Year Emissions
Next, Serbia determines its current GHG emissions for the reporting year (which can be the current year or a future target year like 2030). This value is also expressed in CO_2e and is based on emissions data inventory from all relevant sectors (energy, industry, agriculture, and waste, excluding LULUCF).

3. Use the Formula for assessment of the Percentage of GHG Reduction
To calculate the percentage reduction, Serbia compares the GHG emissions in the current/target year (2030) or the current reporting year with those in **the base year**. The formula used is:

$$GHG\ Reduction[\%] = \frac{Base\ year\ emissions\ [tCO2e] - Current\ year\ emissions\ [tCO2e]}{Base\ year\ emissions\ [tCO2e]}\ X\ 100$$

Where:

- **Baseyear Emissions** are the total GHG emissions in the chosen base year (e.g., 1990 or 2010),
- **Current Year Emissions** are total GHG emissions reported in the BTR for most recent year

During the implementation phase, Serbia will measure its current GHG emissions each year and calculate how much progress has been made compared to the baseline. This is done by using the same formula to compare actual emissions with the base year and to check if the target percentage reduction is on track.
For the first biennial transparency report that will contains information on the end year (e.g. 2030) of its NDC, the assessment of whether Serbia achieved its target will be conducted.
Please note the description and methodology for the NDC target (e.g. GHG emissions in 2030) and each reporting year are identical as for the indicator "Total emissions of GHG" since the same definitions, guidelines and metrics are used and cover the same IPCC sectors and categories.
Since NDC target is excluding the LULUCF no additional elaboration on the approaches used as referred in Decision 18/CMA.1 Paragraph 75(d) is applicable. Same applies to Decision 18/CMA.1 Paragraph 75(e) to 75(h).

IPCC Guidelines used, as applicable and available

2006 IPCC guidelines used, in some isolated cases emission factors from 2019 Refinement has been used. The use is consistent for NDC target and the selected indicator

Report the metrics used, as applicable and available

The indicator is expressed in "CO_{2e}" which aggregates all gasses expressed as CO_{2e} using the GWP from the IPCC Fifth Assessment Report, using 100-year time horizon metric

Indicator's reference levels, previous reporting years and most recent years

- Total GHG emissions in CO2e (1990) = 82.666.826 tCO_{2e}
- Total GHG emissions in CO2e (2010) = 63.799.990 tCO_{2e}
- Total GHG emissions in CO2e (2022) = 62.571.555 tCO_{2e}

Conditions and assumptions relevant to the achievement of its NDC under Article 4

Not applicable

Methodologies used to track progress arising from the implementation of PaMs

Serbia does not include the implementation of policies and measures to track progress arising from implementation of Policies and measures.

Methodologies used to estimate mitigation co-benefits of adaptation actions and/or economic diversification plans;

Serbia does not include estimates of mitigation co-benefits of adaptation actions and/or economic diversification plans in its NDC Target or indicator used to track NDC

3.7 Mitigation policies and measures, actions and plans,

Over recent years, the country has made notable progress, especially with the establishment of its Monitoring, Reporting, and Verification (MRV) system, which can contribute to a more precise sectoral differentiation of data from the Greenhouse Gas (GHG) inventory, which represents a significant step toward creating a transparent and accountable climate policy framework. This system enables Serbia to systematically track its emissions and align its reporting with international standards, a critical foundation for long-term climate action.

In addition in recent years, Serbia has made significant strides in improving its legal framework related to climate change. The country has adopted key pieces of legislation aimed at aligning its policies with European Union Climate Acquis and international climate commitments.

One of the most important steps after the adoption of the Climate Change Law, which provides a legal basis for regulating GHG emissions, establishing national climate strategies, and ensuring compliance with Serbia's obligations under the Paris Agreement was adoption of the legal framework for setting up GHG Inventory system and addressing the MRV of emissions from installations. Additionally, Serbia has introduced laws to promote renewable energy and energy efficiency, laying the foundation for a transition to a low-carbon economy. These legislative improvements mark a critical shift toward integrating climate action into national policy and creating a supportive environment for implementing effective mitigation and adaptation measures. The continued development of this legal framework is essential for ensuring the long-term success of Serbia’s climate goals.

However, while these structural advancements are important, much of Serbia’s climate action infrastructure is still developing. GHG projections are largely carried out with the support of EU accession funds, reflecting both the need for external technical assistance and the early stage of Serbia’s domestic capacity to manage complex climate projections independently. This reliance underscores the necessity for continued collaboration with international partners as Serbia builds the expertise and tools required for accurate and autonomous climate planning.

The formulation of policies and measures (PaMs) designed to reduce emissions and enhance resilience is underway, but the process is still evolving. The challenge lies not just in planning these policies but in implementing them effectively. Implementation remains a significant hurdle, as it requires a transformational change across all sectors of the economy—ranging from energy and transport to agriculture and industry. Achieving meaningful emissions reductions will demand comprehensive reforms, large-scale investments in green technology, and the strengthening of institutional capacities to enforce and manage climate action.

Serbia’s path toward full climate integration is complex, and while the foundational elements are being established, the country is at a critical juncture where early efforts must be scaled up to bring about a systemic shift. The transition will require not only external support but also strong political will, public engagement, and a commitment to sustainable development principles.
As Serbia continues to develop its climate policies, the challenge of translating these plans into actionable and impactful measures will be key to ensuring long-term success in mitigating climate change and adapting to its effects.

3.7.1 Overarching policy documents

Climate Change Adaptation Program for the period 2023-2030 (CCAP)

CCAP, which includes the Action Plan for the period 2024-2026. was adopted in December 2023 with the main goal of increasing the capacity to achieve greater resilience to climate change in order to improve the well-being of people, the economy and the environment through four specific goals. The adaptation program includes an analysis of climate change, its impact, assessment of vulnerability and risk in the sectors identified as the most vulnerable and proposes 25 adaptation measures that have been identified as priorities. The process of reporting on implemented measures is regulated by the Regulation on the list of bodies and organizations responsible for implementing adaptation measures and the content and form of reports on implemented adaptation measures to climate change. This act defines the form and content of the report, as well as the authorities and organizations that are responsible for reporting on disasters caused by climate change and their consequences, implementing measures to adapt to changed climate conditions, and drafting and implementing planning and public policy documents in the sectors most affected by climate change. changes. Reports are submitted to be the Ministry once a year, starting from 2025.

Low carbon development strategy

The **Serbian Climate Strategy** serves as an overarching policy document designed to guide the country toward a low-carbon and climate-resilient future. Its primary aim is to support Serbia's obligations under the Paris Agreement by significantly reducing greenhouse gas (GHG) emissions and transforming the economy into a sustainable, resource-efficient one. The strategy outlines a vision for 2030 and beyond, with longer-term goals aimed at achieving a balance between GHG emissions and carbon sinks by 2050. Serbia's Climate Strategy is grounded in principles of sustainable development, emphasizing a just and equitable transition to a low-carbon economy. This transition is envisioned to be socially inclusive, ensuring economic growth while creating green jobs and enhancing quality of life.

While taking into account its national circumstances, Serbia's climate policy framework is closely aligned with the European Union's climate goals, as the country pursues EU membership. The strategy is consistent with the EU 2030 Climate and Energy Framework, which sets ambitious targets for reducing GHG emissions, increasing the share of renewable energy sources (RES), and improving energy efficiency. By 2030, Serbia aims to achieve a 33.3% reduction in GHG emissions compared to 1990 levels, with a 36% share of RES in its energy mix and a 32.5% improvement in energy efficiency. This alignment is crucial for Serbia's integration into the EU energy market and compliance with its commitments under the Energy Community Treaty.

The strategy explores several GHG emission scenarios to determine the impact of various policy measures and technologies. The baseline scenarios, which assume no new climate actions, project significant increases in GHG emissions over time. In contrast, the mitigation scenarios model more ambitious pathways, with projections of deep cuts in emissions through the implementation of policies such as the EU Emission Trading Scheme (EU-ETS) or equivalent carbon pricing, increased use of RES, and improved energy efficiency. The most ambitious scenario outlines a potential 80% reduction in GHG emissions by 2050, while a more moderate approach aligned with current EU climate policies aims for a 55% reduction by mid-century.

A key focus of the Climate Strategy is the identification of effective mitigation measures across critical sectors, including energy, industry, transport, agriculture, forestry, and waste management. The energy sector, historically responsible for around 80% of Serbia's GHG emissions, is central to the strategy. Increasing the share of renewable energy in electricity production, improving energy efficiency in households and industries, and phasing out coal are essential actions for decarbonizing this sector. In the transport sector, renewing the freight and passenger vehicle fleets with more fuel-efficient and alternative fuel-powered vehicles is critical for reducing emissions. The strategy also

emphasizes the importance of promoting sustainable transport options, such as electrification and biofuels, to lower the carbon footprint of this sector.
In the agricultural and forestry sectors, the strategy outlines actions that will enhance carbon sequestration and reduce emissions. Afforestation, sustainable forest management, and increasing the use of short rotation plantations are key forestry measures that will increase the carbon sink potential. In agriculture, practices like increasing the share of legumes in fodder production and using winter cover crops help to enhance soil carbon storage while reducing reliance on synthetic fertilizers, thus lowering emissions. These measures are designed to contribute not only to the reduction of emissions but also to the enhancement of Serbia's natural carbon sinks.
The strategy acknowledges the longer-term trends in GHG emissions and removals that are likely to emerge as these policies are implemented. The energy and transport sectors are expected to see a steady decline in emissions due to the combined effects of increasing renewable energy use and improving energy efficiency. The adoption of innovative technologies and improved practices in agriculture and forestry will lead to greater carbon sequestration, helping to offset emissions in other sectors. Over time, these efforts are projected to result in a significant net reduction in GHG emissions.
In addition to outlining specific mitigation measures, the strategy also addresses the economic and social dimensions of Serbia's climate transition. It highlights the need for substantial investments in renewable energy infrastructure, energy efficiency technologies, and sustainable transport systems. Public financing will play a key role, but private sector investments and international funding, particularly from the EU and development banks, will be essential for achieving the strategy's goals. Revenues from carbon pricing mechanisms, such as the EU-ETS, are expected to contribute significantly to the funding of mitigation projects, ensuring that the "polluter pays" principle is adhered to.
To ensure the successful implementation of the strategy, a robust monitoring and reporting framework has been established. This framework will track progress in reducing GHG emissions, improving energy efficiency, and increasing the use of renewable energy across sectors. Regular reporting and review mechanisms will ensure that the strategy remains responsive to changes in the national and international climate policy landscape, allowing Serbia to adjust its actions to meet evolving targets and obligations.

Integrated National Energy and Climate Plan (INECP)

The **Integrated National Energy and Climate Plan** of Serbia is a comprehensive operational document that outlines the country's plans for addressing energy and climate challenges up to 2040. It aligns Serbia's national priorities with the broader goals of the European Union's energy and climate framework, focusing on reducing greenhouse gas emissions, improving energy efficiency, and expanding the use of renewable energy sources. This plan focusing on the Energy sector is crucial for guiding Serbia's transition to a low-carbon economy while ensuring energy security, sustainable development, and economic growth.
At the heart of the INECP is Serbia's commitment to decarbonization, which seeks to reduce greenhouse gas emissions by a significant margin by 2030. This is closely aligned with the Climate Strategy, Paris Agreement and Serbia's obligations under international climate frameworks. By setting targets for emission reductions, Serbia aims to contribute to global efforts to combat climate change. These reductions will be achieved through a range of measures that emphasize a shift from fossil fuels to cleaner, renewable energy sources. The plan envisions a substantial increase in the share of renewables, particularly wind, solar, and hydropower, within Serbia's energy mix. The expansion of these energy sources is expected to diversify the country's energy portfolio, reduce reliance on coal and other fossil fuels, and enhance the security of its energy supply.
Energy efficiency is another cornerstone of the INECP. Serbia is committed to reducing its energy consumption through a series of measures aimed at improving efficiency across all sectors of the economy, from industrial operations to residential heating. Improvements in energy efficiency will help reduce overall energy demand, which in turn will lower greenhouse gas emissions and reduce the costs associated with energy production and consumption. The focus is particularly strong on buildings,

where modernization of heating and cooling systems, better insulation, and infrastructure upgrades are expected to contribute significantly to energy savings. These measures will help Serbia meet its climate goals while also improving the quality of life for its citizens by reducing energy costs and enhancing comfort.

Energy security is a critical aspect of Serbia's energy transition. The INECP outlines measures to diversify energy sources and enhance the resilience of the energy system. Historically, Serbia has relied heavily on coal for electricity production, which not only contributes to high levels of emissions but also leaves the country vulnerable to supply disruptions. By transitioning to renewable energy sources and diversifying its natural gas supply, Serbia aims to build a more resilient energy system. This diversification, combined with efforts to increase energy storage capacity, will help ensure that the country can meet its energy needs sustainably and reliably.

Serbia's integration into the broader European energy market is another key objective of the INECP. Modernizing the country's energy infrastructure and regulatory framework to align with European Union standards is essential for Serbia's long-term energy security and economic competitiveness. Integration with the EU's internal energy market will allow Serbia to participate in cross-border electricity trading and market coupling, improving the efficiency of its energy sector and reducing costs for consumers. This market alignment will also help attract foreign investment in renewable energy projects and other green technologies, further accelerating Serbia's energy transition.

Innovation and competitiveness are also central themes within the INECP. The plan emphasizes the importance of research and development in energy technologies, particularly those related to renewable energy and energy efficiency. By fostering innovation, Serbia aims to stay at the forefront of emerging technologies, which will not only help the country meet its climate targets but also create new opportunities for economic growth. The promotion of pilot projects and demonstration initiatives in renewable energy will serve as a testing ground for innovative solutions that can later be scaled up to achieve broader environmental and economic benefits.

The long-term projections outlined in the INECP suggest that Serbia is on a path toward significant reductions in greenhouse gas emissions, with milestones extending to 2035 and beyond. By expanding the use of renewable energy and improving energy efficiency, Serbia expects to see a steady decline in emissions over time. Projections indicate that the share of renewable energy in gross final energy consumption will continue to rise, supported by sustained investments in wind, solar, and hydropower infrastructure. At the same time, improvements in the energy performance of buildings, industry, and transport systems will lead to substantial reductions in energy consumption, helping Serbia meet its efficiency targets while reducing its carbon footprint.

The INECP also highlights the importance of continuous monitoring and evaluation. To ensure the successful implementation of the plan, Serbia has developed a robust system for tracking progress in reducing emissions, improving energy efficiency, and expanding the use of renewable energy. This monitoring framework will allow Serbia to adjust its policies and strategies as necessary to remain on track toward its climate and energy goals. Regular reporting and review mechanisms will ensure transparency and accountability, while also providing the flexibility to adapt to changes in both domestic and international energy markets.

It has to be noted that the INECP is therefore not only a roadmap for achieving Serbia's climate and energy goals but also a tool for ensuring that the country's energy transition is socially inclusive and economically viable. The plan emphasizes the need for stakeholder engagement, ensuring that citizens, businesses, and civil society are involved in the decision-making process. This approach is essential for creating public support for the energy transition and for ensuring that the benefits of this transformation are shared across all sectors of society. By focusing on green technologies, renewable energy, and energy efficiency, the INECP seeks to create new economic opportunities, reduce energy poverty, and improve the overall quality of life for Serbia's population.

3.7.2 Policies and measures in Energy sector

Note: In accordance with decision 18/CMA.1 paragraph 80 only policies and measures that have the most significant impact on GHG emissions or removals and those impacting key categories in the national GHG inventory are listed below.

M-1 Implementation of equivalent measures and transition to emission trading

The objective of the implementation of equivalent measures is to achieve the equivalent emission reduction as EU-ETS but with different policy instruments. The equivalent measures are only applicable to the installations holding GHG permit in accordance with Article 29 of the Law on climate change (OGRS 26/2021).

This is a transitional measure which is to be implemented no earlier than 2026 until the full implementation of the EU-ETS will ensure smooth transition toward the full internalisation of the climate cost into the price of electricity and other products. The boundaries of the measure (e.g. the maximal permissible emissions) for 2030 are set by WEM scenario. Therefore, for example the emission boundaries for the public electricity and heat production at 29,745 $ktCO_2$ in 2026 are expected to be gradually decreasing to 26,807 $ktCO_2$ in 2030 which is 21,0% emission reductions compare to 2015. The electricity producers will be allowed to integrate the costs of decarbonisation in the price of their products, if pledged[34] to invest in decarbonisation and contributing to the increasing use or RES in electricity production. If electricity producer would exceed the annual emission allocation, the exceeded amount will be subject to payment of carbon tax expressed in dinars per ton of CO_2. In order to allow for flexibility and to reflect the yearly variations in electricity production, the banking and borrowing of annual emission allocation is to be allowed at a certain level of sectoral emissions in 2015.

The same equivalent measures could be applied also for the manufacturing industry which will be in accordance with WEM scenario able to increase its GHG emissions by 5,8% while the emissions from industrial processes are expected to be able to increase emissions in average by 28,6% by 2030 compared to 2015 levels. The equivalent measures compliances mechanism for manufacturing industry is to take into account that those activities are in the EU subject to limited free allocation of allowances subject to activity specific benchmark values.

Upon accession to the EU it is expected that Serbia will join the EU-ETS. EU ETS works on the 'cap and trade' principle. A cap is set on the total amount of certain greenhouse gases that can be emitted by installations covered by the system. The cap is reduced over time so that total emissions fall. The annual compliance under the EU-ETS is enforced through the surrendering of the EUA allowances equivalent to the amount of emissions as determined in the verified emission report. Implementation of the monitoring, reporting and verification (MRV)[35] aspects of EU-ETS as determined by the relevant provisions of the Law on climate change is already in place since 2023.

M2 Support scheme based on tendering procedures (auction scheme) for commercially cost-effective RES technologies

The measure which is implemented and aiming in ***Increasing the use of RES in electricity production*** will continue the implementation of a support scheme for the production of electricity from renewable

[34] Pledge will be opreationalised through contractual emission reduction mechanism between the Ministry of Environmental Protection and operator of installation

[35] Implementation of the monitoring, reporting and verification a prerequisite for monitoring the compliance with equivalent measures

energy sources according to the provisions of the Law on the use of renewable energy sources. Operational aid will be provided through the developed support scheme in the form of a market premium, so as to foster the electricity production from the most cost competitive renewable technologies. The conduction of auctions will ensure that the operational aid will be provided with an open, transparent, competitive, non-discriminatory and cost-effective manner avoiding unnecessary distortions of electricity markets as well as taking into account possible system integration costs and the required grid stability. Moreover, the sustainability of the financial support will be ensured, while the publication of a long-term schedule of auctions and quotas will provide the required stability for the investors, who are willing to participate into the planned auctions. Implementation costs are estimated at 2.1B€. The measure is aiming to increase the installed capacity of wind parks and photovoltaic plants to 2.6 GW by 2030.

M3 Support RES technologies that will not participate into the tendering procedures

Measure will foresees the potential provision of economic support to the renewable energy sources, which will not participate into the planned auctions within the framework of measure M2 primarily for small scale-decentralized RES systems. The economic support will be differentiated for each renewable energy source separately according to their operational characteristics in order to ensure that a fair and transparent profitability will be given to the investors. A monitoring mechanism will be applied for determining the provided support for each renewable energy technology separately according to the evolution of their cost and the technological improvements and for assessing the effectiveness of the provided incentives. The support to small decentralized renewable energy systems will be designed taking into consideration the potential benefits to the electricity grids, due to the avoided investments for the adaptation, enhancement and expansion of the grid networks, and supporting households as micro-investors.

Finally, the legislative framework for the conclusion of bilateral contracts for renewable power purchase agreements among RES suppliers and final energy consumers in order to sell the produced electicity for anana predefined period will facilitate the further deployment of renewable energy. Implementation costs are estimated at 0.7 B€.

M4 Economic support to innovative and demonstration pilot RES projects

Measure will provide financial and fiscal incentives, such as investment aid, tax exemptions or reductions, tax refunds, to innovative and demonstration projects under the precondition that they lead to a considerable increase of the national value added and address significant local energy needs. The installation of floating photovoltaics and vertical wind turbines, the promotion of small wind turbines, the construction of concentrated solar power plants and the development enhanced geothermal systems comprise indicative innovative and demonstration pilot RES projects, which should be examined. The support of small decentralized renewable energy systems will be also examined taking into consideration the potential benefits to the electricity grids. Implementation costs are included in measure M3.

M5 Carbon pricing and excise duties on energy

The introduction of carbon pricing and of appropriate levels of excise duties as a policy instrument, enables implementation of the polluter pays principle in the sectors and activities not covered by equivalent measures. The purpose if this measure, is to make fossil fuels less competitive for use by final consumers, compared to sustainable biomass or other less carbon intensive fuels. In the medium-term, appropriate carbon pricing is an important driver for consumer to redirect investment to low or zero carbon technologies and in energy efficiency. Recycling of funds collected from carbon pricing should be used to support implementation of measures reducing GHG emissions by final consumers such as households, commercial and institutional sector and industry.

Furthermore, the excise duties on energy products need to be fully harmonized with Directive 2003/96/EC, so that the Excise Duty Law includes excise duties for coke and coal. In addition, further harmonization of the excise policies on petroleum products with Directive 2003/96/EC is necessary, in the part concerning minimum amounts of excise taxes in various applications (such as motor fuel for industrial and commercial purposes, for agriculture, forestry, fish farming, public works, stationary engines, etc.).
Such instrument can be combined with taxation exemptions for SME, subject to contractual emission reductions arrangements where SME are investing in GHG emission reduction measures.

M6 Improving energy efficiency in industry

Improving energy efficiency in the energy intensive industrial sector is crucial to enhance competitiveness. The industrial sector will have to promote and implement energy efficiency projects and employ best available technology (BAT) to retain its competitive advantage.
Energy efficiency improvement in the industry will be achieved with a bundle of instruments. Based on 3rd National for energy efficiency action plan from 2016 the instruments are:

- Improvement of energy efficiency in particularly non-SME companies by providing financial and informational support to engage in energy audit and implementation of proposed measures from the energy audit.
- Support for installation of CHP (through amended feed in system).
- Standards for minimum energy efficiency requirements for heat boilers or CHP (valid from 2017)

Furthermore, an energy efficiency obligation scheme (or alternative measures) is envisaged to be established, as defined by the Energy Efficiency Directive (2012/27/EU). Through the scheme companies that sell energy to final consumers are obliged to achieve energy savings at the final consumers through different measures that they support. Measures are financed by the companies themselves and they have to report yearly on achieved savings.
In addition to the above, the Electric motor regulation and the Eco-design Directive, will to be transposed and implemented.

M7 Improving thermal integrity of households

Improving thermal integrity of households reduces heating and cooling needs, consequently reducing energy costs as well as investment costs in heating and cooling infrastructure. There is an estimate that 85% of current buildings do not fulfil minimum energy efficiency requirements[36].
Renovation of a building is financially very demanding, therefore financial support to households for these measures is crucial. However, to support the most appropriate investment decision for households, an independent advice network of energy experts should be established which would, free of charge, provide advice to citizens on energy efficiency measures and use of RES in households. The advice network should be financed by the Government (through energy efficiency fund) so that independence from equipment producers is assured. Furthermore, building codes for new buildings and renovations have to be updated so that they are aligned with EU New Energy performance of buildings directive 2018/844/EU entered into force in 2018. Full transposition of Energy efficiency directive is also needed. It has to be noted that Article 4 of the Directive 2018/844/EU requires the preparation of the Long-term strategy for mobilising investment and facilitating the renovation of national building stock.

[36] IPA Project "Climate Change Strategy with Action Plan"; Annex I of Result 1 Report: Assessment of Current Serbian Climate Change Policy Framework - Energy sector

M8 Energy efficiency, improvement of heating and cooling infrastructure and promotion of use of RES in households

A large share of single-family houses predominantly uses old inefficient boilers on coal and wood biomass. Coal combustion causes high specific CO_2 emissions, while coal and biomass use in inefficient boilers also cause high emissions of $PM_{2.5}$, which has adverse effects on health. More efficient boilers reduce fuel use, while also decreasing emissions since they have better efficiency. The EU has, in 2015, adopted first Eco-design Regulations for solid fuel boilers and solid fuel local space heaters that will take effect from 1. January 2020 and 1. January 2022. The regulations set minimum requirements for seasonal space heating energy efficiency and emissions of particulate matter (PM), volatile organic compounds (VOC), carbon monoxides (CO) and nitrogen oxides (NOx). With transposition and implementation of the above-mentioned regulations, customers will not be able to buy devices that do not comply with the minimum requirements set.

Serbia has to transpose these revised labelling regulations for solid fuel boilers and solid fuel local space heaters to its legal system as soon as possible, since it will take a long time to substitute all the devices used.

To support substitution of old inefficient solid fuel boilers especially on coal, subsidies should be provided to households for the purchase of new boiler on wood which meets Eco-design regulations requirements or, alternatively, heat pumps. Connection to local district heating systems should also be supported, especially in agglomerations with recorded exceedance of $PM_{2.5}$ emissions.

Another important measure for higher penetration of RES for heating in buildings is the definition of minimum requirements for use of RES in new and renovated buildings. This requirement should also be included in the legislation on energy efficiency in buildings.

M9 Improving energy efficiency and use of RES and thermal integrity in the Tertiary sector

Commercial and institutional buildings represent important opportunities for the application of energy efficiency measures, as they are professionally managed and their respective owners and/or managers are sensitive to energy costs, which are projected to increase (through the inclusion of the carbon price in electricity and of the carbon pricing on fuels).

This measure targets at reducing energy consumption in the governmental/ services/ commercial buildings. The objective of measure is to improve mainly the way heating and cooling needs in the tertiary sector are served, including the improvement of electrical appliance used in the services sector. The objective of the measure is to reduce consumption of energy (including electricity) and replacing fuels with zero or lower emitting fuels for heating purposes.

The public sector has in the public procurement process defined minimum requirements for some energy using equipment (office information technology, cooling appliances, air conditioning, lighting). The scope of products and services will have to be broadened in line with the EU green public procurement criteria. The public sector, through this instrument, also provides support to the market of energy efficient products.

Improving thermal integrity (insolation) of the tertiary sector buildings, reduces heating and cooling needs, contributing significantly to energy efficiency gains. Consequently, energy costs as well as investment costs in heating and cooling infrastructure are reduced. In Serbia an important share of buildings in the tertiary sector, in particular public buildings, are connected to district heating systems, which leaves the building managers without options to manage the energy supply side, which is covered by the measure “Improving energy efficiency and use of RES in the Tertiary sector”. This is the main reason these two measures are separate, given that, in many cases, tertiary building managers do not influence the efficiency of heat production.

For all buildings, the priority shall be in improving the thermal integrity. Buildings that have heating infrastructures (boilers), shall invest in them in parallel or only after the investments in the thermal integrity are completed. The development of energy services market is foreseen in the National Energy

Efficiency Action Plans and Serbia has already included ESCO[37] approach in the primary and secondary legislation. The situation needs to be improved by support schemes combining ESCO financing with budgetary grants for public buildings. This approach should be rolled out immediately, as financing of energy efficiency projects in the public sector can more efficiently be done through energy performance contracting (EPC).

M10 Renewal of the passenger fleet and promotion of sustainable passenger transport

Efficiency improvement of vehicle stock and usage of vehicles

New vehicles are becoming more efficient based on CO_2 standards that are in effect in EU, of which Serbia benefits indirectly. The EU Regulation 443/2009 (amended by Regulation 2109/631 EU) targets for CO_2 emissions of 130 gCO_2/km in 2015 and 95 gCO_2/km in 2021. In 2019, the EU targets for 2030 have been agreed, emissions have to decrease by 37.5 % by 2030 compared to 2021 levels for cars and by 30 % for vans. The EU, for the first time in 2019, agreed also on the reduction target for trucks and buses, for which the average emissions of new vehicles in 2030 will have to be 30 % lower than in 2019. Based on these targets, vehicles in Serbia will become more efficient even if Serbia is not part of the EU, since the same vehicles are sold in Serbia as in EU. Serbia needs to align its legislation to the EU legislation by 2023 but no later than by 2025.

For the improvement of efficiency of vehicles, it is important that Serbia controls the import of used cars and their use, especially for very old ones. There is a risk that, due to upcoming electrification, even more old vehicles from the EU will be imported to Serbia, limiting the effects of the legislation on new vehicles. That is why the legislation on yearly taxation has to change in the way that it will stimulate buying vehicles that are more efficient and emits less CO_2 per km. The Law on taxes on the use, possession and carrying goods (Official Gazette of the Republic of Serbia no. 26/01, 80/02, 43/04, 132/04, 112/05, 114/06, 118/07, 114/08 and 31/09) defines yearly tax for vehicles that is dependent on the volume of the engine and age of the vehicle. Discount for older cars needs to be gradually removed, since they have much greater negative impact on the environment than new cars. To support low CO_2 emissions vehicles, CO_2 emissions should be included in the calculation of level of the yearly registration tax, with lower taxes for lower emitting cars. For a faster penetration of electric vehicles, subsidies would need to be offered, at least in the early stage of market development. Furthermore, the Public Procurement Directive, aligned with the Directive on the Promotion of Clean and Energy Efficient Road Transport Vehicles, recognizes that public procurement can be a powerful market mover for the introduction of new technologies, including of clean and high energy efficient vehicles. This is not because it can have direct large impact on emissions reduction, but because of its large demonstration effect. Serbia will have to invest in charging infrastructure for electric vehicles and also for other alternative fuels (natural gas). This will, partially, is to be supported by the Government.

Promotion of public transport and non-motorized transport

Increase of use of public transportation (33 % until 2030 compared to 2010), is fundamental to limit the emissions growth up to 2030. In that regard, a bundle of measures is needed, including improved planning, investments enabling competitive different means of transport and changing commuting habits. Those measures should build on a revised Transport strategy which should include climate change aspects of transport and mobility development. Furthermore, regional/local low-carbon transport strategies and sustainable mobility urban plans are to be developed with the focus on

[37] ESCO is a company or other legal entity or entrepreneur registered for the provision of energy services which by providing energy services increases the energy efficiency of the facility, technological process and service and which to some extent accepts the financial risk for the energy services provided, by collecting its services, in whole or in part, on the basis of the savings achieved on the basis of the measures implemented and the fulfillment of other agreed performance criteria

improvement of non-motorised transport infrastructure. Investments in infrastructure (railway) have already started and need to continue in accordance with national plan for public railway infrastructure

Promotion of usage of alternative fuels and biofuels

Directive 2009/28/EU and 2015/1513/EC (recast by Directive 2018/2001/EU) by has been partially transposed in the Energy Law (Official Journal of RS, 145/14) [38] and with the following by-laws:

- Regulation on technical and other requirements for liquid fuels with bio origin (Official Gazette RS, 24/14)
- Regulation on guarantee of origin (Official Gazette RS,82/17) [39]
- Regulation of sustainability criteria of biofuels (Official Gazette RS, 89/19) [40]

Support schemes for production of RES II biofuels (from wastes, residues, non-food cellulosic material, and ligno-cellulosic material) does not exist, thus there is almost no production. Therefore, it is necessary to prepare Directive specific implementation plan and fully transpose and implement Fuel Quality Directive and implement updated RES directive in order to allow 2nd generation of biofuels to penetrate into Serbia's transport fuel market and set up of support schemes for production of biofuels (from wastes, residues, non-food cellulosic material, and ligno-cellulosic material).

M11 ***Renewal of the freight fleet and promotion of sustainable freight transport***

Freight transport is necessary for economic growth and normally witnessing higher growth rates than GDP. As such, in a context where Serbia's GDP will continue to grow and freight more than the GDP, it is important to find modalities to limit from this source, without necessarily limiting freight and growth. Serbia lies on X. and XI. Corridors experiencing high freight flows also from abroad. These are rapidly growing and will further heavily increase when Serbia joins the EU, due to free trade and movement of goods, as has also been experienced by other countries joining EU.

Therefore, in order to support promotion of sustainable freight transport it is important to implement modulation of yearly infrastructure charges for heavy duty vehicles (HDVs) according to CO_2 emission performance standards and implement road charging for freight vehicles based on EURO emission standard.

Furthermore, the updates of Strategy of railway, road, inland waterway, air and intermodal transport development of Republic of Serbia 2008-2015 has to be prepared to assess different aspects of transport development and Serbia's needs and possibilities to define optimal infrastructure development path for the future in order to ease the future pressure on road infrastructure.

3.7.3 Policies and measures in IPPU

M12 Implementation of the F-gas Regulation and Mobile Air Conditioning (MAC) Directive

The European Union has adopted revised F-gas regulation (517/2014), replacing the previous version (842/2006), which entered into force on 1st January 2015. The regulation is designed to reduce emissions of fluorinated greenhouse gases (F-gases) by two thirds of 2017's levels by 2030. Regulation (EU) 2024/573 which is amending Regulation 517/2014 is even more ambitious than its predecessor,

[38] https://www.paragraf.rs/propisi/zakon_o_energetici.html
[39] https://pravno-informacioni-sistem.rs/eli/rep/sgrs/vlada/uredba/2017/82/1
[40] http://demo.paragraf.rs/demo/combined/Old/t/t2019_12/t12_0274.htm

focusing on a complete phase-out of HFCs by 2050, covering new sectors, enforcing stricter recovery rules, and fostering market conditions for the adoption of cleaner technologies. The Regulation retains many important and successful features of the previous F-Gas Regulation related to leak prevention, F-gas recovery and technical training; key additional instruments that have to be transposed and implemented are:

- Product and equipment ban: restrictions on the placing on the market (bans) of certain refrigeration and air conditioning equipment, foams and propellants using F-gases, and of SF_6 in small magnesium foundries.
- Service and maintenance bans: Limits on the use of higher GWP gases, such as R404A and R507A, in existing refrigeration equipment from 2023.
- Cap and phase down: Reductions on the placing on the market of F-gases via a cap and phase down on the supply of HFCs.

Based on the Law on Air Protection (Official Gazette RS, no 36/2009 and 10/2013) [41], in 2013 a national Regulation on fluorinated greenhouse gases management, as well as on conditions for license issuance to import and export of such gases (Official Gazette RS, No 120/13) was adopted. This by-law transposed some of the requirements of EU Regulations 842/2006/EC, 1493/2007/EC, 1494/2007/EC, 1497/2007/EC, 1516/2007/EC and Directive 2006/40/EC in the national legal system of Serbia. However, the EU Regulation transposition into Serbian national legislation is in initial stage. The national Regulation is not yet fully harmonized with the provisions referring to training and certification of technical persons, control of the use of fluorinated greenhouse gases, establishing and allocation of quotas for placing of fluorinated greenhouse gases on the market

Serbia is to transpose F-gas regulation with some derogations as follows

- Service and maintenance bans: Limits on the use of higher GWP gases, such as R404A and R507A, in existing refrigeration equipment with a charge size of 40 tonnes of CO_2 equivalent or more is considered from 2023. If charge size is lower than 40 tonnes of CO_2 equivalent R404A is allowed to be used.
- For equipment with a charge size of 40 tonnes of CO_2 equivalent a regenerated R404A can be used by 2030. Equipment retrofit is allowed for switching to R448A, R449A and R452A in accordance with restrictions as contained in f-gas regulation

Furthermore F-gas emissions from mobile air conditioning (MACs) in EU are regulated through Directive 2006/40/EC on mobile air conditioners. It is being enforced over three phases, starting in 2008. Second stage was that air conditioning systems in new vehicle types had to be filled with gases with a GWP lower than 150. From 2017 onwards, this applies to all new air-conditioned vehicles put on the EU market. Despite the fact that MACs Directive has not been yet transposed into Serbian legal system, it is being in practice implemented by EU automotive industry operating in Serbia in order to ensure conformity of its products with EU standards.

3.7.4 Policies and measures in Agriculture

M13 Winter Cover Crops

The planting of winter cover crops is generally assessed as having positive effects for the management of soil erosion, soil fertility, soil quality, water, and weeds, as well as for biodiversity and the mitigation of GHG emissions. The area for cover crops is limited to the area not covered by regular crops during

[41] https://www.paragraf.rs/propisi/zakon_o_zastiti_vazduha.html

the winter season. Winter cover crops do not produce a market output, but have costs for machinery, other inputs and seed. If winter cover crops are legumes, the bio-fixation will reduce fertilizer demand of the main future crops.
Having in mind the positive effects regarding fertilization and phytosanitary functions, this measure is beneficial to farmers, however knowledge about the positive effects of winter cover crops, as well as provision of financial support (e.g. direct payments) need to be increased through enhanced activities of the Agriculture Advisory Service. In parallel the promotion of sustainable land use (greening) is to be promoted through green direct payments for crop diversification, maintenance of permanent grasslands and allocation of 5% of arable land to areas beneficial for biodiversity: Ecological Focus Areas (EFA), for example trees, hedges or land left fallow that improves biodiversity and habitats.

M14 Increased legume share in fodder area

Legumes on temporary grassland increase bio-fixation and, therefore, reduce fertiliser needs. It is assumed that the legume share on temporary grassland can be increased to a maximum of 20%, which is equivalent to a nitrogen fixation rate of 15%.

This measure saves costs for fertilizer and provides nutritious fodder, so it is beneficial to farmers. The precondition is increasing knowledge of farmers and implementation of environmental standards regarding use of fertilizers, as well as provision of financial support.

3.7.5 Policies and measures in LULUCF

M15 Afforestation

This measure prescribes the afforestation of 5.000 ha every year up to 2030 (and should be continued up to 2050). This requires the additional afforestation of 2952 ha, compared to the current average level of 2048 ha.
In order to enhance the resilience of the new forest to the impacts of climate change, and as a novelty compared to what is foreseen in the draft Forestry Development Programme, site mapping is to be used in order to identify the tree species that should be planted in each site. Based on the results of the mapping, only adapted tree species should be planted.
A bucket of instruments should be used for the implementation of this measure, where the most important are financial, regulatory and informational/educational.
Dialog among different forest related policies and institutions (forestry, cadastre units, agriculture, water management, and nature protection) should be started in order to minimize conflicts between land use categories, especially in the Autonomous Province of Vojvodina. Public enterprises for forest management and others should have capacities to prepare enough seedlings or seeds to support afforestation.
The update of cadastre regarding land use category is a precondition for successful afforestation in addition to the removal of the legal barriers for afforestation of the class V to class VIII agriculture land. This measure will decrease transaction cost and create attractive opportunities for more afforestation especially by private entities.

M16 Conversion of coppice to high forest

This measure prescribes the annual conversion of 7.000 ha of coppice forest to high forests, in particular oak and beech coppice forests for conversion into high forest. At the present, the government is financing amelioration of forests, which also includes direct conversion of coppice forests. Direct conversion of coppice forests is a process consisting of clear cut of certain areas and then artificial planting. This measure is available for both State and private forests.

Improvement of coppice and devastated forests on good sites by redefining productivity parameters and extension of rotation period, followed by adequate tending intervention, will generate products with higher diameter which leads to products that will have long-term CO_2 storage (furniture, doors and other wood products with long term storage capacity). Surplus of the fuel wood that results from these activities can be used as a source of energy for boilers in local communities or in individual heating systems.
The quantity of wood which will be felled during this process will, in the short term, increase emissions (during the burning process), but due to the higher average increment in high forests (3.0 m^3/ha higher, compared to increment in coppice forests), the total balance will result in an increase in CO_2 sink.
Production of sufficient planting material where direct and indirect conversion is not successful, needs to be planned in advance, in order to be able to secure enough planting material of site adapted tree species. Increasing of harvesting and tending operations will produce demand for sufficient number of qualified forest workers and machinery.

M17 Short Rotation Plantations (SRP)

This measure proposes an area of additional 1500 hectares annually to be established using poplars and willows as the main tree species. Annual increment in SRP is 10 m^3/ha up to age 10, and 18 m^3/ha after that. The biomass from short rotation plantation will serve as a source of bioenergy for combined heat and power plants.
As for the afforestation measure, the update of the cadastre and land use harmonization among different land users and owners is a precondition for successful establishment of SRP and removal of all cross-sectoral barriers regarding the implementation of the SRP on agricultural land.

M18 Regeneration of over mature stands

The objective is to remove over mature trees from the forest stands which have low production capacity (even negative CO_2 effects) and establish naturally or artificially new forest stands with high productivity (group mixture where is possible). This is of significant importance for the forestry and climate change sectors, since the annual increment of over matured stands is only 3 m^3/ha and their absorption capacity is negligible, compared to increment of young stands of 8 m^3/ha.
Production of sufficiently planting material for afforestation of areas where natural regeneration is not successful, is needed in order to secure enough planting material of site adapted tree species. Increasing of harvesting and tending operations will produce demand qualified forest workers and machinery.

3.7.6 Horizontal actions to support transformational change

M19 Climate change education, training for new skills and awareness raising

Combating climate change requires change in behaviour of all actors in society: from top level decision making at public and private levels, to daily consumption patterns. Change is best operated through a multitude of stimulus, which can effectively be provided through education, training for new skills and awareness raising.
The implementation of the measures included in this action plan and the achievement of the general and specific objectives inscribed in the Strategy will determine the reduction of activities in some sectors and increase of activities in others. This means, that sectors with reduction in activities will have labour surplus, while sectors with increased activities could face labour shortage. This plan is to

dedicate special focus into the development of activities aimed at promoting the acquisition of skills relevant for sectors with increased activities, by workers of the sectors where labour surplus is expected. The implementation of this measure, will contribute to the social fairness of the transition to a low carbon economy.

The proposed national plan shall include three areas:

- Education: focused on kindergarten to 12th grade (kindergartens, primary and secondary schools), with a view to identifying opportunities and issuing recommendations for integration of climate change issues in school curricula; recommendations on university studies may also be integrated in the plan.
- Training to gain new skills needed for transition into carbon constrained economy: focused on adult learning, aims at identifying technical needs required to fight climate change, in particular for the implementation of the measures included in this action plan.
- Awareness raising aimed at reaching the widest audience possible, focusing on the key aspects / behaviours that can contribute to the successful implementation of the measures included in this chapter.

Note:
None of the actions, policies and measures listed under this chapter influence GHG emissions from international transport.
Methodologies and assumptions are presented in the following chapter.

Interaction Between Mitigation Options

The mitigation options outlined in the list have the potential to interact with and reinforce each other across sectors, creating synergistic effects that amplify their overall impact on reducing greenhouse gas (GHG) emissions. These interactions can be grouped into several categories based on the sectors they influence:

1. Energy Sector

- **Transition to Emission Trading (M1)** and **Carbon Pricing/Excise Duties on Energy (M5)**: These market-based mechanisms create economic incentives for industries to lower their emissions by putting a price on carbon. By driving up the cost of fossil fuels, they support the adoption of renewable energy technologies and efficiency measures.
- **Increasing the Use of RES in Electricity Production (M2, M3)** and **Support for Innovative RES Projects (M4)**: As carbon pricing increases the cost of conventional energy, renewable energy sources (RES) such as wind, solar, and other technologies become more competitive. In parallel, supporting innovative and demonstration RES projects, particularly those not subject to tendering processes (M3), ensures the diversification of RES and accelerates their integration into the grid.
- **Energy Efficiency Improvements in Industry (M6) and Households (M7)**: Reducing energy demand through efficiency measures lowers the overall consumption of fossil fuels, indirectly supporting the RES deployment and share in gross inland consumption by reducing the total demand that needs to be decarbonized. Improvements in thermal integrity in households and upgrades to heating and cooling infrastructure (M8) further reduce the energy needed, amplifying the impact of carbon pricing. In addition, this measures are also reducing pressure on the biomass supply which is having a positive effects on the forests land annual carbon gains and losses balance.
- **RES in the Tertiary Sector (M9)**: By promoting RES and energy efficiency in the service sector, there is a spillover effect that influences other sectors, such as transport, by reducing the demand for energy-intensive services.

2. Transport Sector

- **Renewal of the passenger Fleet (10)**: The renewal of the passenger fleet contributes to decreasing demand for fuel which consequently means less imports and less emissions in the whole supply and distribution chain. Phasing in EV will shit the demand from oil to electricity and foster the deployment of smaller renewable solutions with electricity storage capacity to minimise the adverse effects on the power grid. In order to achieve synergies, the decarbonisation of the transport sector shall be implemented in conjunction with the decarbonisation and decentralisation of the electricity production. Furthermore, in order to avoid congestions and additional negative effects on air quality in growing agglomerations the promotion, decarbonisation and expansion of public transportation services is needed especially in big urbanisations.
- **Renewal of the Freight Fleet (11)**: The renewal of freight transport systems to more fuel-efficient vehicles is crucial, particularly as emission trading and carbon pricing (1, 5) increase the cost of carbon-heavy fuels. More efficient freight vehicles reduce overall GHG emissions, and when coupled with **sustainable freight transport** initiatives (e.g., electrification or biofuels), they further reduce dependency on fossil fuels and align with the broader energy transition toward RES.

It has to be noted that all the interactions not only within the Energy sector but also between the Energy sectors and Other such as Agriculture and forestry are imbedded and dealt with the

PRIMES-GEM-E3 modelling suit including the assessment of social and macroeconomic effects of the implementation of Policies and measures as well as other non-GHG related mitigation benefits.

3. Agriculture and Forestry

- **Winter Cover Crops (M13) and Increased Legume Share (M14)**: These measures improve soil health and increase carbon sequestration in agricultural systems. By reducing the need for synthetic fertilizers and enhancing natural nitrogen fixation, these practices contribute to lower GHG emissions. Additionally, they support overall **afforestation (M15), Short Rotation Plantations (M17), and Conversion of Coppice to High Forest (M16)** strategies by enhancing the carbon sink potential of both agricultural and forested areas.
- **Forestry Practices (Afforestation, Coppice Conversion, SRP, Regeneration of Stands)**: Each forestry option enhances carbon sequestration and serves as a GHG sink. Regeneration of over-mature stands (M18) ensures that forests remain productive in absorbing carbon over time. As RES expands in the energy sector, the increased use of **biomass from SRP** and sustainable forestry practices creates a circular benefit between sectors.

It has to be noted that all the internal interaction of measures the agriculture and forestry sectors contained in the CAPRI mitigation measures library are death within the CAPRI model as well as the interactions with the Energy sector (biomass).

4. Education and Awareness (M19)

- **Climate Change Education and Training (M19)**: Cross-cutting all sectors, this measure supports the long-term sustainability of all mitigation actions by increasing public awareness, training workers in new technologies, and building the capacity for innovation. Education ensures that the workforce and society are equipped to engage in and sustain the transition to low-carbon technologies and practices.

3.8 Modification of Longer-Term Trends in GHG Emissions and Removals

The implementation of these policies and measures has significant long-term implications for Serbia's GHG emissions and removals, shaping the country's path towards its **NDC** targets and global climate goals.

1. Energy Sector

- **Transition to Emission Trading and Carbon Pricing (M1- M5)**: These tools will gradually shift Serbia's energy production away from fossil fuels and towards renewables by making carbon-intensive energy sources economically unviable. The long-term trend is a steady reduction in emissions from the energy sector, with a clear shift towards low-carbon electricity production. As the use of RES in electricity generation increases (M2-M4), emissions from this sector will decline substantially. The carbon pricing mechanism will also incentivise energy efficiency improvements across industries and households, leading to further reductions.
- **Energy Efficiency Improvements (M6-M9)**: These measures will ensure a steady decline in energy demand, particularly for heating, cooling, and electricity use. By reducing energy consumption, these policies help flatten the demand curve, lowering the overall need for energy production and reducing emissions both in the short and long term. Improvements in household energy efficiency, particularly through better thermal integrity, will contribute to sustained reductions in residential sector emissions.

2. Transport Sector

- **Passenger and Freight Fleet Renewal (M10-M11)**: The renewal and promotion of sustainable freight transport will lead to long-term emission reductions in the transport sector. By

modernizing fleets with low-emission vehicles or transitioning to alternative fuels, On the mid-term Serbia can reduce the growth in transport emissions as one of the more challenging-to-decarbonize sectors which will require significant resources from the private sector. This policy aligns with longer-term global trends towards electric and hydrogen-powered vehicles, gradually driving down GHG emissions over time.

3. Agriculture and Forestry

- **Afforestation and Improved Forestry Management (M15-18)**: The long-term trend in land-use and forestry management practices will increase Serbia's carbon sequestration capacity. Through afforestation, conversion of coppice to high forest, and the regeneration of over-mature stands, Serbia will expand its carbon sinks over time. These measures will help offset emissions from sectors where it is harder to achieve zero emissions (e.g. Agriculture), contributing to a net reduction in GHG levels. The combined effect of increasing the **legume share (M14)** and winter cover crops in agriculture (M13) will also improve soil carbon stocks, further enhancing carbon removals.

4. Climate Change Education and Awareness (M19)

- **Long-Term Behavioural Shifts**: Investing in climate change education and skills training ensures that Serbia's population is equipped to adopt low-carbon technologies and practices. Over the long term, awareness-raising campaigns and workforce training will lead to behavioural shifts that reduce energy consumption, promote sustainable agricultural practices, and encourage participation in carbon markets. These actions create cultural and economic shifts that support sustained GHG reductions and carbon removal practices.

Costs and non-GHG mitigation benefits

Due to extensive interaction among the measures cost and non-GHG mitigation benefits are included at scenario level. Furthermore, it has to be noted that the results of the cost assessment are expressed as costs of implementation.

3.8.1 Cost of implementation

Measures proposed listed above require additional investments across different sectors than those in a case of "no-action" (WOM scenario). These **additional** investment costs are estimated at 6,5Bln EUR for the period 2020-2030 and between 37,8 and 76,8Bln EUR for the period 2030-2050.
Such additional investment costs will be shared among consumers/households (for example in buying more efficient cars and electrical appliances or by isolating their dwellings), investors/companies (new trucks, renewable energy sources) and the state (e.g. renewal of the public transportation system and afforestation in state owned lands). Consumers and investors will bear most of the investments/costs (respectively, 63% and 33% up to 2030; and 68% and 26% in the period 2030-2050)[42]. The state bears the remaining 4% and 6% of investment costs in the periods 2020-2030 and 2030-2050 respectively.

[42] For the purpose of these estimates, costs have been allocated to the one who makes the investment, irrespective of its capacity to pass the costs of the investment down the value chain to consumers and irrespective of any public subsidies or incentives it received. Investors have been considered to represent companies, public or private and farmers; consumers represent households, and state represents state investments from state budget.

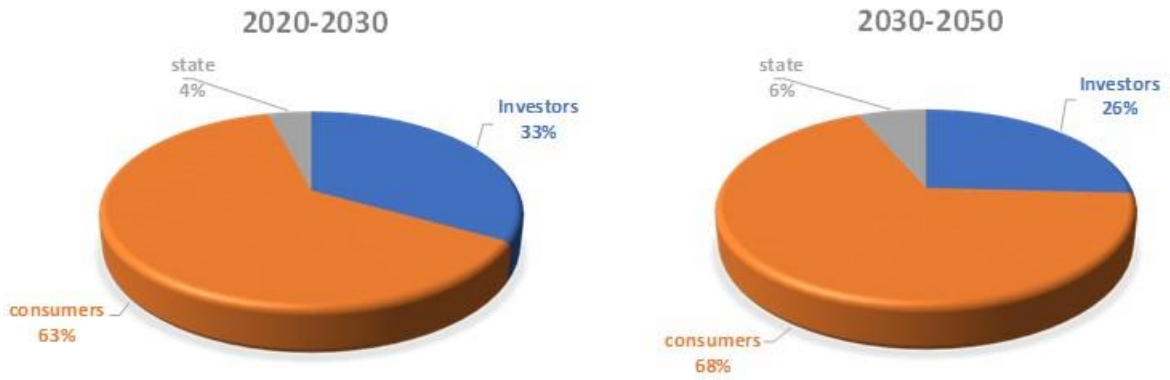


Figure 16: Share of investment cost in the period 2020-2030 and 2030-2050

The State will have an additional role to support the implementation of the measures listed in chapter 3.7, though the definition of the regulatory, fiscal and incentive schemes. In this context, the revenues from the EU-ETS auctioning or other equivalent measures shall be treated by the State as an important source of financing of state incentives, because that will allow positive impact on the state budget.
Generally, the highest additional investment costs, as usual, are associated with the energy sector. The decarbonisation process will trigger a series of additional investments, but particular focus will be on additional investments in the power grid, due to increase of the share of RES. Additional investments in the power grid are estimated at 160 million EUR up to 2030, and in a range between EUR 2.7bn and EUR 4.3bn in the period 2030-2050. The total additional investments triggered by the EU ETS or other instruments for determining carbon price in the 2030-2050 period, (at least from EUR 2.3bn to EUR 3.6bn), are actually lower than the power grid investments, due to the lower investments needs in the thermal power plants when compared to the WOM scenario.
This means that, because of the decarbonisation process, in the long-term, investments in thermal power plants will be lower than in the baseline scenario (up to EUR -1.4bn in the period 2030-2050), while investments will be realised in the GHG emission reductions. Furthermore, large additional investments are needed in RES, which are estimated within the Integrated National Energy and Climate Plan and are amounted to EUR 3,1bn.

According to the WEM scenario, additional investments in the improvement of the thermal integrity of households, that is energy efficiency of the household buildings itself including transmission and ventilation losses or gains, and renewal of passenger fleet, will together require the largest share of additional investments up to 2030 (63%) and in the period 2030-2050 (65,9% in WEM and 63,2% in WAM)[43]. Figure 17 presents the share of additional investments costs for the WEM scenario, for the period 2030-2050[44].

[43] For these shares, the sectors with investment needs lower than in the baseline are not included.
[44] The shares do not change significantly in the other scenarios, therefore the long-term WEM scenario share is presented for illustrative purposes.

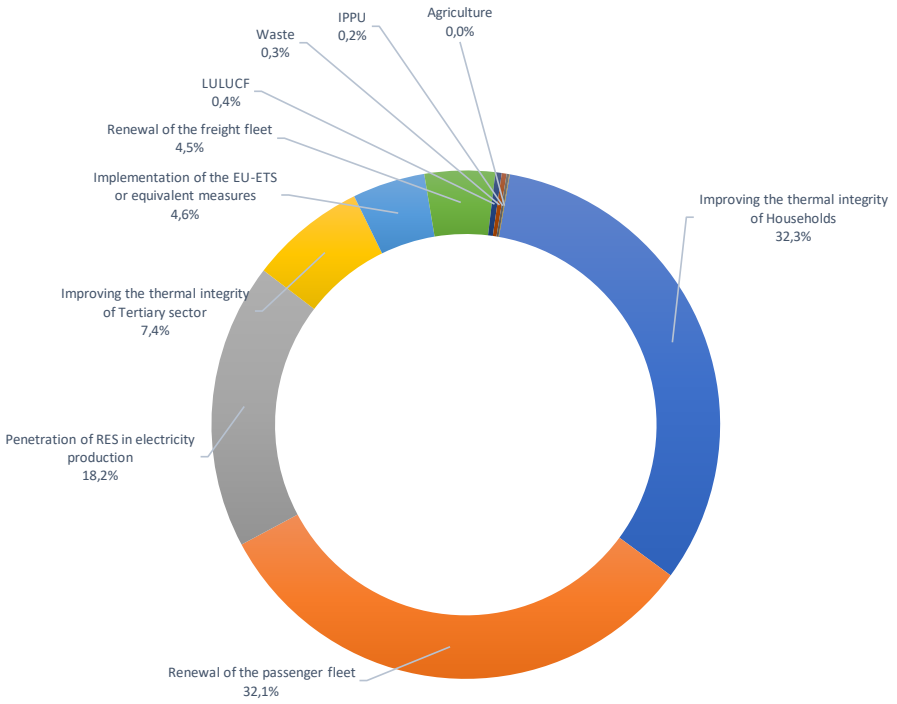


Figure 17: Shares of additional investment costs (%) for the WEM Scenario in the period 2030-2050, excluding measures in sectors with investment needs lower than in the baseline

Up to 2030, additional 1,85Bln EUR should be invested in the improvement of household thermal integrity. These investments increase to 7,44Bln (WEM) to 24,98Bln EUR (WAM) in the 2030-2050 period. The additional investment in thermal integrity of households has a great impact on the investment needs in Heating and Cooling Infrastructure, which are, in the long-term, lower than in the baseline scenario. The reduction of investment needs in infrastructure ranges between 37Mio EUR and 760Mio EUR in the period 2030-2050, as a result of increased energy efficiency from thermal integrity. The same is the case for the Improvement of Energy Efficiency and RES in the Industrial Sector, where additional investment needs are, in the long-term, lower compared to the WOM scenario (between 559Mio EUR in the WEM scenario and 213 Mio EUR in the WAM scenario), and for Improving the Efficiency of Electrical Appliances for Households, with lower investment needs in the short and long terms.

The renewal of the passenger fleet will require additional investments up to 2,3Bln EUR up to 2030, ranging from 18,2Bln EUR and 24,8Bln EUR in the period between 2030 and 2050. The additional investment for the IPPU sector represents the costs associated with compliance with the EU regulations on F-gases and Mobile Air Conditioning Directive, which are covered by equipment producers. Additional investments by 2030 are estimated at 5 Mio EUR, while additional investment for the period 2030-2050 is expected to amount between 82 Mio EUR and 129 Mio EUR.

In the agriculture sector, additional investment needs (80 Mio EUR by 2030) are mostly related to best practices that enhance carbon sink in the soil, namely through winter cover crops. The additional investment needs in the agriculture sector increase significantly in the long-term and in the most ambitious scenario (WAM) and amount between 469-1585 Mio EUR in the period 2030-2050, when emissions reductions can only be achieved through expensive measures such as linseed as feed additive, nitrification inhibitors and precision farming.

The additional investment costs in the waste sector are limited to the period 2030-2050 and in the WAM scenario, given that the baseline scenario already includes the investments required for the transposition of the EU *acquis* for the sector.

The investments in the forestry sector amount to 92 Mio EUR in the period up to 2030 and mostly represent the effort required to meet the afforestation targets foreseen in the WEM mitigation scenario. In the long-term, the level of investment needs remains constant, except for WAM, where the target for afforestation is extremely ambitious, requiring significant investments (621 Mio EUR in the period 2030 – 2050). Table 9 includes the additional investment costs required for the implementation of the measures, by sector, with additional detail for the energy sector due the highest additional investments costs.

Table 9: Additional investment costs required for the implementation of Strategies' low carbon development pathways (upper and lower) (in comparison with the WOM scenario) (million EUR)

	2030	2030-2050	
	M2	upper	lower
Energy sector (total)	**6,335**	**37,088**	**74,219**
Industrial Process and Product Use	**5**	**82**	**129**
Agriculture	**80**	**469**	**1585**
Waste	**0**	**0**	**239**
LULUCF	**92**	**183**	**621**
TOTAL additional costs (compared to the baseline scenario)	**6,511**	**37,822**	**76,792**

The costs associated with the implementation of the EU-ETS or other instruments for determining carbon price in the Republic of Serbia are different from those associated with other measures: the direct costs of these measures can be expressed as potential carbon penalties if requirements are not implemented by the entry into force of the EU-ETS[45]. These so-called "other measures" aim to gradually create price signals equivalent to those of the EU-ETS thereby enabling decarbonisation and smoother preparing of operators for the participation in the EU- ETS. These costs are considered running costs and, therefore, are not included in the table above.

3.8.2 Non-GHG mitigation benefits

Social impacts

The social impacts refer to:

1) Employment

The employment in the baseline scenario (including jobs created and jobs lost) are: 2,438 million in 2025, 2473 million in 2030 and 2438 million in 2050 (Table 10).

The impact of the implementation of measures is limited. In 2030, a negative impact of 1.4% on net jobs created is expected (this means that in 2030, Serbian economy will generate 2438 million net jobs, compared to 2473 million in the WOM scenario). For 2050, the negative impact on net jobs created is 2% in the WEM scenario and 2.5% in the WAM scenario.

However, there is a possibility even to reduce such impacts on employment[46], if the investments required for the implementation of measures listed in chapter 3.7 are financed through loans, while the revenues of ETS auctioning or other instruments for determining carbon price are used to support

[45] When the EU introduced the EU-ETS in 2005, the electricity producers and industrial installations received free allowances for their GHG emissions. The electricity producers only after 2013 received no free allowances while other industrial installations received free allowances on the basis of EU benchmark values.

[46] *The values in the square brackets [ ] in Table 10*: Impacts on employment.

the implementation of climate change measures (at least 50%), and decarbonisation process, and as a direct assistance to poorer households for example through fiscal benefits, instead of being used to reduce public debt , and Table 10 presents the impacts on GDP in such case.

Table 10: Impacts on employment

	Impacts on employment(%)			
	2020	**2025**	**2030**	**2050**
WOM (000 jobs)	2 462	2 468	2 473	2 483
WEM (%)	0.0%	-1.3	-1.4 [0.84%]	-2.0 [0.93%]
WAM (%)	-	-	-	-2.5 [0.93%]

The greatest transformations could be expected in the "Mining and quarrying" sectors and in the "Electricity, gas and steam supply"[47] sectors, where job losses are expected[48]. On the other hand, an important job growth is expected to take place in the "Agriculture and forestry" sectors, in particular in the forestry and the forestry related sectors (for example, wooden products)[49].
As such, negative impacts on employment can be expected in sectors dominated by large companies, and the positive ones in sectors with the micro and small enterprises.
In addition, two measures, implementation of ETS and afforestation, can be assumed as measures particularly affecting men, because the first one will reduce jobs in the mining sector, and the second will increase those in the forest and forest related sectors which are traditionally male-dominated occupations.

2) Share of energy costs in household expenditure

The share of energy costs in household expenditures slightly fluctuates from 18% in 2020 to 15% in 2050 in the WOM baseline scenario. The implementation of the measures listed in chapter 3.7 would imply an increase of the share to 19.1% in 2030. By 2050, the share of energy costs in household expenditure is projected to increase (compared to the same year in the baseline scenario) by additional 2.7% (to 17.7%) in the WEM scenario and by 5.3% and to 20.3% in the WAM scenario. This increase in energy costs is associated with the internalisation of costs which are related to the carbon emissions and investments in low carbon technologies as part of the energy price paid by households.
In any case, the comparison of the share of costs in households in 2050 with those in 2020 (in WOM) shows that the share of energy costs in household expenditure will decrease between 0.2%-0.3% if WEM scenario is implemented, i.e. increase by 2.3% if WAM scenario is implemented.

Table 11: Share of energy costs in household expenditure

	Share of energy costs in household expenditures			
	2020	**2025**	**2030**	**2050**
WOM(%)	18%	19%	18%	15%
WEM (change from WOM)	18.3%	19.8%	19.1% (+1.1%)	17.7% (+2.7%)
WAM (change from WOM)	-	-	-	20.3% (+5.3%)

[47] *In these two sectors, respectively, 77% and 89% of employees work at large companies, in accordance with the data of the Statistical Office of the Republic of Serbia.*
[48] This means that more jobs will be lost than new jobs created
[49] *In this sector, 64% of employees work at micro, small and medium enterprises, in accordance with the data of the Statistical Office of the Republic of Serbia*

If it is assumed that women have a particular role in using energy in households (lighting, heating, cooking, cleaning, ironing)[50], then measures that affect the price and the consumption of energy will affect women more than men. Such assumed measures, which imply the increase of energy price (such as the implementation of ETS or introduction of RES) tend to have a negative impact on women, while measures that reduce energy consumption (such as improving the efficiency of electrical appliances for households and heating and cooling infrastructure for households) tend to have a positive impact. In the same way, measures related to biomass use as energy source in households, namely for cooking and heating (such as promotion of proper use of wood) may positively affect women. However, the poorest population will be affected the most with the increase of energy price.

Economic impacts

Two indicators have been selected to assess the **economic impacts** of the implementation of the mitigation measures: **GDP** and **household consumption**.
The following are the operative definitions used:

- **GDP:** the monetary value of final goods and services—that are bought by the final user—produced in a country in a given period of time (usually a year).
- **Household consumption:** the amount of final consumption expenditure made by resident households to meet their everyday needs, such as: food, clothing, housing (rent), energy, transport, durable goods (notably, cars), health costs, leisure, and miscellaneous services (household consumption is also referred to as household spending).

1) GDP

The implementation of measures has, in terms of percentage, a low impact on long-term GDP growth rates in the Republic of Serbia.

Table 12: Average annual growth rate of the GDP in the period 2020-2050

	WOM	WEM	WAM
GDP	3.77%	3.68%	3.64%

Table 13 includes the projected impact of the implementation of the measures listed above on GDP, compared to the GDP in the WOM scenario. The impact on GDP amounts to -1.4% in WEM by 2030 and -2.7% in WEM, and -3.8% in WAM by 2050 compared to the of the use of ETS revenue (or revenues from equivalent carbon taxation) and the use of loans for investments.

Table 13: Impacts on GDP compared to the WOM scenario

	2025	2030	2050
WEM	-1.0%	-1.4% [-0.12%]	-2.7% [-0.76%]
WAM	-	-	-3.8% [-1.55%]

This means that GDP will continue to grow according to all scenarios, but slightly slower than in WOM (presented in Table 12). If it is assumed that investments are implemented through loans and use of ETS auction revenues, as described previously, the impacts on GDP will be reduced significantly.

2) Household consumption

[50] Government of the Republic of Serbia and United Nations Country Team in Serbia http://rs.one.un.org/content/unct/serbia/en/home/publications/gender-equality-and-climate-change.html (15 May 2019)

Household consumption, expenditure or spending represent how much each family spends and they are the largest component of GDP in developed economies.
As a result of the implementation of measures listed in chapter 3.7 , household consumption can be affected mainly via the impacts on employment and on the price of energy. On the one hand, the household consumption is affected to the same extent to which the implementation of measures impacts the creation of net jobs. On the other hand, increased energy costs reduce households' disposable income for the purchase of other products.
Compared to the baseline scenario, the household consumption will decrease by 2.5% in 2030 in the WEM and by 5.4% in the WOM scenario by 2050 (Table 14) Regardless of this impact, the household consumption will, in the period 2020-2050, more than double (from 26.0 million EUR to 60.7 million EUR), which indicates that the impacts of the implementation of measures are expected to be below 6% (from 3.0 to 3.4 million EUR).

Table 14: Impact on household consumption compared to the WOM scenario

	Household consumption			
	2020	**2025**	**2030**	**2050**
WOM (million EUR)	25,980	31,085	36,635	60,732
WEM	0.0%	-2.3%	-2.5%	-5.0%
WAM				-5.4%

Environmental benefits

1) Emissions of $PM_{2.5}$

Biggest negative impacts on climate change in the Republic of Serbia result from the combustion of solid and liquid fuels for power generation, domestic heating, vehicle engines and industry. During such combustion, particulate matter which has harmful effects on human health is emitted Measures listed in chapter 3.7 will contribute to the reduction of $PM_{2.5}$ emissions by 7% in 2030. After 2030, the reduction of emissions of $PM_{2.5}$ intensifies, reaching 28.7% in the WEM scenario and 39.7% in the WOM scenario by 2050 (Table 15). Although it is not its goal, the implementation of measures listed in chapter 3.7 will contribute to cleaner air and to the reduction of health problems associated with air pollution. Premature deaths associated with air pollution from fuel combustion are expected to increase by 34.5% up to 2030 and between 54.8% and 61.8% by 2050.

Table 15 Impacts on Emissions of $PM_{2.5}$

	Air quality: Emissions of $PM_{2.5}$			
	2020	**2025**	**2030**	**2050**
WOM (kt)	29.7	28.6	27.0	27.9
WEM	8.8%	0.5%	-7.0%	-28.7%
WAM	-	-	-	-39.7%

2) Nitrogen balance (N Balance)

Nitrogen balance (N balance) is a measure of nitrogen input (from fertiliser, manure, crop residues, etc.) minus nitrogen output (from gaseous loss, mineral runoff, etc.). Nitrogen is a vital nutrient that helps plants and crops grow, but high concentrations are harmful to people and nature. The closer to zero the N Balance is, the more environmentally friendly the respective measure is.
Table 16 illustrates the actual value of the N Balance (kt) in the WOM scenario, which shows the downward trend from 2020 to 2050. This trend is intensified with the implementation of the

measures listed in chapter 3.7. In 2030, the N Balance is reduced by 1.3% in WEM in comparison to the baseline scenario, while by 2050, N Balance reduction amounts to 3.1% and 33.7% in the WEM and WAM scenarios respectively.

Table 16*: Impacts of scenarios on the N Balance*

	Soil and Water Protection (N Balance)			
	2020	**2025**	**2030**	**2050**
WOM (kt)	237	208	178	186
WEM	0.0%	-0.6%	-1.4%	-3.2%
WAM	-	-	-	-33.7%

3.9 Projections of greenhouse gas emissions and removals

The potentials and opportunities for reducing GHG emissions by 2030 and 2050 in the Republic of Serbia have been identified in the Low Carbon Development Strategy for the period 2020-2030 with projections to 2050, and the measures to achieve them are described in the Action Plan (Strategy was adopted in 2023). The Strategy presents a least cost pathways to reduce GHG emissions. The possibilities for reducing GHG emissions by 2050 have been identified through the following main scenarios:

- **Without measures (WOM)** or Baseline (Business as usual, BaU) - Excludes all policies and measures implemented, adopted, or planned after 2015;
- **With measures (WEM)** - Considers policies and measures provided for in the adopted Strategy;
- **With Additional Measures (WAM)** - GHG emission reduction by 80% compared to 1990. The implementation of the WAM scenario (additional action in relation to WEM) is possible with full financial, technological and technical assistance of the international community.

3.9.1 Models used

Serbia decided to use three sectoral models (GEM-E3, CAPRI and IPCC waste tool) that provides Serbia with a comprehensive, precise, and internationally aligned approach to preparing its projections. With the three models Serbia covers 96% of its GHG emissions as presented on the figure below:

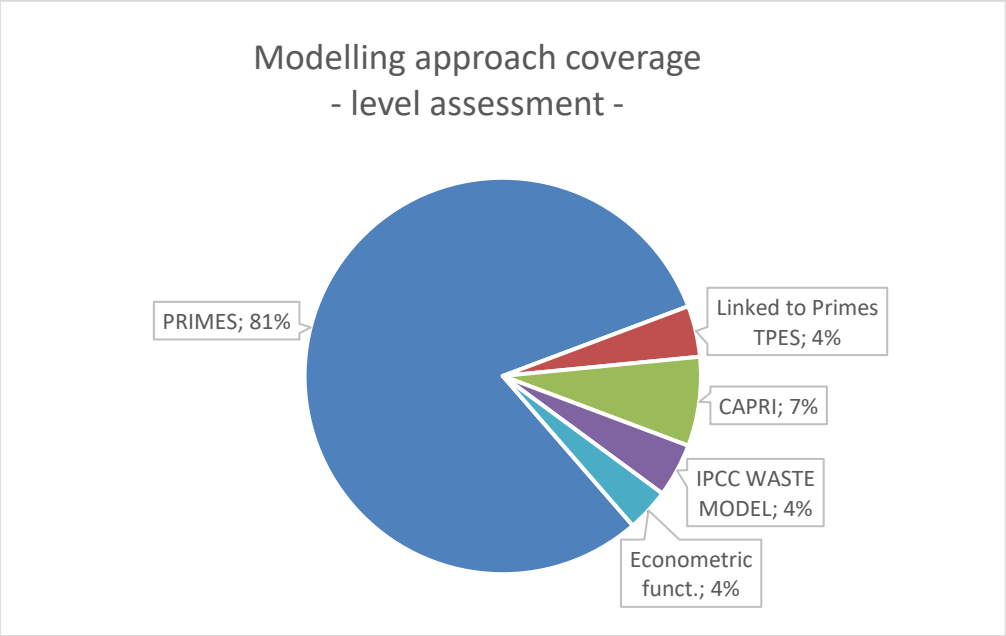


Figure 18: Shares of Total GHG emissions covered by each of the modelling tools

Each model brings sector-specific expertise that enables the government to develop policies that are informed by robust data, reflecting both national circumstances and modelling best practices. Use of such approach provides Serbia with:

Sector-Specific Expertise and Precision

- Each of the models used—**PRIMES GEM-E3** for energy and industrial processes, **CAPRI** for agriculture, forestry, and land use, and the **IPCC Waste tool** for waste management—provides

specialized analytical capabilities tailored to the unique dynamics of its respective sector. By using these specialized models, Serbia can generate more precise and accurate projections because each model is designed to capture the complexities of specific sectors that have distinct characteristics, behaviors, and variables.

Compliance with International Standards and reporting requirements

- **PRIMES GEM-E3**, **CAPRI**, and the **IPCC Waste tool** are all widely recognized and utilized within the EU and internationally, ensuring that Serbia's projections align with global methodologies. The use of these models adheres to international best practices and ensures that the country's projections are comparable with those of other nations, especially in the context of climate reporting and compliance with frameworks such as the Paris Agreement and EU Energy and Climate Acquis.

Integrated and Consistent Projections

- While each model focuses on a distinct sector, they complement one another to provide a cohesive and comprehensive picture of Serbia's overall environmental and economic projections. For example:
    - **PRIMES GEM-E3** offers a macroeconomic and energy balance perspective, critical for understanding how the energy sector will evolve under different policy scenarios.
    - **CAPRI** provides insights into land use and agriculture, which are crucial for greenhouse gas (GHG) emissions from land and resource use.
    - The **2006 IPCC Waste tool** ensures accurate waste sector projections that integrate well with the other sectors for a holistic understanding of Serbia's environmental outlook.

Adaptation to National Circumstances

- Serbia's economic, geographic, and sectoral structures have specific characteristics that require adaptation to national circumstances. These models offer flexibility to account for national data, policies, and conditions, while still adhering to modelling guidelines. This approach ensures that projections are relevant and realistic for the national context, allowing for more effective planning and policy-making.

Cross-Sectoral Synergies

- Using distinct models for Energy, AFOLU (Agriculture, Forestry, and Other Land Use), and waste management sectors allows Serbia to better capture interactions and synergies between sectors. For instance, emissions reductions in the energy sector (via PRIMES GEM-E3) may influence land use patterns (through CAPRI), and waste management improvements (modelled through the IPCC Waste tool) can impact overall GHG emissions. This cross-sectoral approach leads to more robust and coherent policy strategies.

Enhanced Policy Simulation Capabilities

- Sectoral models allow Serbia to explore a wide range of **policy scenarios** within each specific sector. For example:
    - **PRIMES GEM-E3** can simulate the impacts of energy policies, carbon pricing, and industrial emissions reductions.
    - **CAPRI** can model the effects of agricultural policy, land use changes, and afforestation programs.
    - The **IPCC Waste tool** can simulate changes in waste management policies and their effect on emissions. This allows the government to test the effectiveness of various policy measures and their impacts on GHG emissions and economic growth, helping to make data-driven decisions.

Alignment with National and International Climate Goals

- The use of sectoral models helps Serbia align its projections with its Nationally Determined Contributions (NDCs) and other national climate goals and energy goals. It allows the country to monitor and report on sector-specific emissions accurately, thereby contributing to the overall national targets for reducing GHG emissions.

Support for Evidence-Based Decision Making

- By using established sectoral models, Serbia ensures that its projections are based on rigorous, evidence-based analysis. This improves the credibility of national climate and environmental strategies, supports negotiation positions in international forums, and enhances stakeholder confidence in the projections and policies being pursued.

PRIMES GEM-E3 modelling suit

The PRIMES energy system model and the macro-economic model (GEM-E3) are developed and maintained at E3Modelling. The models include the possibility to simulate a large range of policies.
The Energy system model PRIMES simulates the energy system and electricity markets at a national level and imports-exports between the European countries, to quantify projections into the future depending on a set of assumptions, which constitute a scenario.
The model outputs include the detailed energy balances, both for demand and supply, CO_2 emissions, investment in demand and supply, energy technology penetration, prices and costs. The main PRIMES sub-models are: PRIMES Residential and Tertiary sector module, PRIMES Industrial sector module (including many industry sectors and subsectors), PRIMES-TREMOVE Transport model, PRIMES-Gas Supply model PRIMES-Biomass model, PRIMES power sector-district heating-CHP complex of models, PRIMES-Refinery, PRIMES-primary production, the EU ETS market simulator, and the balancing and market clearing model integration routine. The core of the model includes residential, tertiary, industry, transport, power sector, district heating, CHP and aggregate models for gas, coal and oil supply. When needed, the detailed models on biomass, gas supply, refineries and the power market simulation, run as satellite models of the core PRIMES model.
The assumptions include economic activity by sector in industry and in services, population, current and future techno-economic characteristics of energy related technologies, world energy prices, availability and potential for indigenous energy resources including renewables, and grid infrastructure (electricity, gas, transport, etc.).
The policy-related assumptions include greenhouse gas (GHG) emission targets and possible emission trading schemes, renewables targets, energy efficiency targets, renewable and efficiency support schemes, technology and plant operation regulations and standards, taxation and subsidies, technology diffusion policies, policies to ease financing, other market-related regulations and policies for infrastructure and its use. EU-wide legislation is not directly applied to Serbia, as Serbia is not an EU country, but parts of the EU legislation have been transformed into national legislation, otherwise national legislation applies.
Running ex-post the core PRIMES model, a special power sector simulation model (PRIMES-IEM) simulates in detail the daily operation of electricity system and markets, at national, regional or EU level. The “Market and Unit Commitment” model simulates on hourly basis -for selected days of the year- the Day Ahead, Intraday, Balancing and Ancillary Services Markets, and provides Unit Commitment schedules and financial settlements among the participants. Cross Border activity is also integrated in the simulating environment and can handle various assumptions about cross border market coupling and competition opening in the various stages of the power markets.
PRIMES input on economic activity is provided by **GEM-E3** model, which is a multi-country and multi-sector computable dynamic general equilibrium model, maintained and developed at E3Modelling. The model covers all production sectors of the economy (aggregated into 3 sectors in the model version used for this project) and the institutional agents of the economy, namely the state, firms, households and banks. The model computes the equilibrium prices of goods, services, labour and

capital that simultaneously clear all markets subject to an overall closure of the financial markets (and implementation of the Walras law), while simulating the individual behaviours of all actors which determine demand and supply of goods and services, as well as labour and capital, and the substitutions between them driven by relative prices, preferences and technological possibilities.
The model determines equilibrium of goods, services and financial flows simultaneously at national and international levels, hence international trade of goods and services is endogenously determined, covering the entire global economy. Policies which internalize environmental externalities are included in the model and are fully integrated in the behaviour of actors. Public policies of all kinds and public finance are integrated in the model. The dynamics of the model are driven by endogenous investment by sector of activity, the purchasing of durable goods and the debt accumulation in the financial sectors.
The GEM-E3 model produces the projection of macroeconomic and sectoral activity figures, which are given as inputs to PRIMES. In addition, GEM-E3 is used for macroeconomic impact assessment of energy system changes due to different policy assumptions in the context of scenarios. For this purpose, GEM-E3 takes the energy projections from PRIMES projects changes in GDP, activity by sector, employment, income, consumption, investment and foreign trade.
The PRIMES power system model includes a significant detail for power plants and system operation features in comparison to other long-term energy models. The model includes capacity expansion and, in the version, used for this project an ex-post simulation of the unit commitment problem for simulation of daily operations. The power sector model includes representation of the high voltage interconnection network linking Transmission System Operators (TSO) control areas, which roughly coincide with country areas. Thus, one country is a node (bus) in the electricity network represented in the model. Possible limitations of power flows arising from insufficient network in the interior of a country are neglected. The power model simulates power flows based on a DC linear simplification and does not perform stability analysis. The time resolution of power system balancing is hourly. Ancillary services of all kinds are included in the model as demand constraints, balanced by offers by plant depending on the capability of each plant in the provision of each type of ancillary service. The distribution grid (low and medium voltage) – although not spatially represented- is included in cost and investment calculation through reduced-form cost functions, which relate investment in distribution grids with the degree of development of dispersed generation and the peak load. Demand response, the recharging of electric vehicles, the development of dispersed generation, for example using rooftop solar PV, are simulated by inducing additional investments and costs in the distribution grid, which can be attributed to development of smart meters and control systems, which are not explicitly represented in engineering detail. The model includes all power plants one by one for power plants above, except for very small power plants.
The gas supply model of PRIMES represents in detail and individually the pipelines interconnecting countries, including the limitation of export possibilities if gas network within a country limits export. The limitation of the network within a country is simulated through proxies in the demand side modules of PRIMES Nevertheless, a detailed simulation of the gas network within a country is out of scope of this model.
The PRIMES-TREMOVE transport model includes a stylized representation of spatial information into urban, metropolitan and inter-urban, and includes also a distinction of trips by length. This allows to simulate a variety of trip categories, which have different features and play an important role in the choice of vehicles which have range limitations, such as the electric cars. The availability of refuelling/recharging infrastructure is also simulated through proxies.
In the PRIMES version used for Serbia, the demand side includes 5 categories of buildings for residential, 3 service sectors and 11 industrial sectors further split into 30 subsectors. The model further includes about 200 different industrial processes in the industrial model, as well as representing boilers and CHP for industry separately. The models keep track of capital vintages by group of technology in a dynamic way, keeping track of the characteristics of the stock, simulate stock turnover; the model also allows for premature scrapping of technologies e.g. when policies push for

higher stock turnover. While having a significant engineering-based resolution of technology representation, it is much more aggregated than resolution followed by engineering approaches that study an individual house or an individual factory or some bottom-up models. Again, this limitation is a usual feature of the long-term energy model.

While proxies are used where spatial information is relevant in general terms a country is handled as a single entity in spatial terms. Neither the energy nor the macroeconomic model include full spatial resolution. The lack of spatial information in the interior of each country is a typical limitation of long-term energy models –such as PRIMES-, and is due to computing complexity for this kind of models, which handle multiple time periods and multiple countries simultaneously.

The models are very well suited to carry out the type of analysis performed within this project –mid- to long term transformation of the energy system with policy or other constraints including the possibility to represent structural transformation. The degree of resolution serves increasing the robustness of the model in the representation of technical systems, but the principal aim is using the model to simulate behaviours, market clearing and calculate costs and prices, in order to support policy making in the energy field.

The GEM-E3 model is very detailed as compared to other macroeconomic models. The main limitation, which is common in all these models, arises from the use of typical functional forms, such as the constant elasticity of substitution function, used as production and consumption functions. The sectors and households are aggregated. Volumes are measured in constant money, as in all macroeconomic models.

The E3 Modelling version of GEM-E3 has been used for Serbia; this version is also being regularly used for impact assessments of the European Commission in the fields of energy, transport and climate. web address: http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=6440

CAPRI MODEL

CAPRI (Common Agricultural Policy Regional Impacts) is a global agricultural sector model developed at Bonn University with a clear focus on Europe. The main characteristics are:

- Global multi commodity model covering about 60 agricultural and processed products and 80 world regions, aggregated to 40 trade regions.
- Supply modelling in Europe occurs in more detail (280 NUTS2 regions, potentially disaggregated into 2000 Farm Types) in nonlinear programming models. Both the behavioural function of the global market model as well as the nonlinearities in the European programming models ensure smooth responses to changes in economic incentive.
- Partial equilibrium, meaning that non-agricultural sectors are excluded but there are options and experience to link the CAPRI core model to CGEs.
- European agricultural land use is represented completely (including fruits, vegetables, wine etc), but some globally relevant crops (e.g. peanuts) and forestry are not modelled.
- The livestock sector is represented in great detail including feed requirements (energy, protein, fibre etc.) and young animal herd constraints
- CAPRI has a detailed coverage of CAP and agricultural trade policies (including TRQs), relying on the Armington approach for two-way international trade.
- The model is not designed for stand-alone outlook work but incorporates external prior information combined with a statistical analysis of its time series database
- It is comparative static and not suitable for very long scenario runs (>2050).

CAPRI model description

CAPRI model is composed of a comparative static supply and a market module, interlinked with each other.

The **supply module** covers about 60 agricultural and processed products with a focus on EU, Norway, Western Balkan Countries and Turkey. The model aggregates on regional level (280 NUTS2 regions, potentially disaggregated into 2000 Farm Types) are independently calculated in compliance with the farm activities of the Economic Accounts for Agriculture (EAA).

The model represents European agricultural land use (including fruits, vegetables, wine, etc.) and also covers forestry and other land use categories, but the treatment of all non-agricultural land use types (forestry, wetlands, settlements, and residual land) is rather aggregate. By contrast, the livestock sector is represented in great detail including feed requirements (energy, protein, fibre, etc.) and herd constraints for young animals.

The programming is a kind of hybrid approach by applying Leontief-technology and non-linear cost functions. While variable costs (purchased inputs, feed and fertilizer) are captured by Leontief-technology covering a low and high yield variant for the different production activities, non-linear cost functions describe the effects of labour and capital on farmers' decisions.

The animal sector is quite complex in the CAPRI regional programming models because it includes various internal relationships as well as inter-linkages with the crop sector. Among the former are the various input-output relationships related to young animals.

CAPRI includes fertilizer balances and a module with feeding activities covering nutrient requirement of animal. Grass, silage and manure are assumed to be non-tradable and receive internal prices based on their substitution value and opportunity costs. A land supply curve let total area use shrink and expand depending on returns to land.

The objective accounts for revenues from selling products, costs from buying inputs and costs for other production factors as well as non-linear costs.

Detailed Green House Gas effects (GHG) concerning agriculture and land use, land use change and forestry (LULUCF) as well as income and premiums paid under Common Agriculture Policy (CAP) are integrated in the supply module.

Market prices are exogenous in the supply module. They are provided by the market module.

The **global market module** consists of two sub-modules, one for marketable agricultural outputs and the other for young animals and their prices. Only the first is described here.
The market module for marketable agricultural output is a spatial, non-stochastic global multi-commodity model for more than 50 primary and processed agricultural products. It covers about 70 countries or country blocks in 40 trading blocks.
Bi-lateral trade flows and attached prices are modelled based on the Armington assumptions.
The behavioural functions for supply, feed, processing and human consumption apply flexible functional forms. Calibration algorithms ensure full compliance with micro-economic theory.
Policy instruments cover (bi-lateral) tariffs and the Tariff Rate Quota (TRQ). This sub-module delivers prices used in the supply module and allows for market analysis at global, EU and national scale, including a welfare analysis.
The **link between the supply and market modules** is based on an iterative procedure. In the first iteration, the regional aggregate programming models of the supply module (one for each NUTS2 region) are solved with prices taken from the baseline. After being solved, the regional results of these models (crop areas, herd sizes, input/output coefficients, etc.) are aggregated to the country level, leading to a certain deviation from the baseline solution, depending on the kind of scenario. Subsequently the supply side behavioural functions of the market module (for supply and feed demand) are recalibrated to pass at the given prices through the quantity results from the supply models. The market module is then solved, yielding new equilibrium producer prices for all regions, including European countries. These prices are then passed back to the supply models for the following iteration.
For the **ex-ante period** trend estimates, corrected with policy shifts, are integrated with external forecasts (e.g. ex-ante simulations form GLOBIOM) and consistency requirements.
Supply and market module are calibrated ex ante to these results, the so-called reference run or **baseline**. The baseline covers the current legislation, technical progress, population and income growth as well as changes in consumption pattern.
Simulation runs are measures against this baseline. Standards and market measures to influence GHG emission as well as transfers and other CAP measures and their impact on supply, demand, trade flows, production levels and yields, inputs, producer and consumer prices, income and environment can be simulated.
Detailed CAPRI model documentation can be obtained from the European Commission/Climate Actions/ Modelling tools for EU analysis:
https://ec.europa.eu/clima/sites/clima/files/strategies/analysis/models/docs/capri_long_en.pdf

IPCC 2006 WASTE MODEL

IPCC 2006 waste model description

Treatment and disposal of municipal, industrial and other solid waste produces significant amounts of methane (CH_4). In addition to CH_4, solid waste disposal sites (SWDS) also produce biogenic carbon dioxide (CO_2) and non-methane volatile organic compounds (NMVOCs) as well as smaller amounts of nitrous oxide (N_2O), nitrogen oxides (NO_x) and carbon monoxide (CO). CH_4 produced at SWDS contributes approximately 3 to 4 percent to the annual global anthropogenic greenhouse gas emissions (IPCC, 2001). In many industrialised countries, waste management has changed much over the last decade. Waste minimisation and recycling/reuse policies have been introduced to reduce the amount of waste generated, and increasingly, alternative waste management practices to solid waste disposal on land have been implemented to reduce the environmental impacts of waste management. Also, landfill gas recovery has become more common as a measure to reduce CH_4 emissions from SWDS.

Decomposition of organic material derived from biomass sources (e.g., crops, wood) is the primary source of CO_2 released from waste. These CO_2 emissions are not included in national totals, because the carbon is of biogenic origin and net emissions are accounted for under the AFOLU Sector. Methodologies for NMVOCs, NOx and CO are covered in guidelines under other conventions such as the UN Convention on Long Range Transboundary Air Pollution (CLRTAP). No methodology is provided for N_2O emissions from SWDS because they are not significant.

The IPCC methodology for estimating CH_4 emissions from SWDS is based on the First Order Decay (FOD) method. This method assumes that the degradable organic component (degradable organic carbon, DOC) in waste decays slowly throughout a few decades, during which CH_4 and CO_2 are formed. If conditions are constant, the rate of CH_4 production depends solely on the amount of carbon remaining in the waste. As a result, emissions of CH_4 from waste deposited in a disposal site are highest in the first few years after deposition, then gradually decline as the degradable carbon in the waste is consumed by the bacteria responsible for the decay.

Transformation of degradable material in the SWDS to CH_4 and CO_2 is by a chain of reactions and parallel reactions. A full model is likely to be very complex and vary with the conditions in the SWDS. However, laboratory and field observations on CH_4 generation data suggest that the overall decomposition process can be approximated by first order kinetics (e.g., Hoeks, 1983), and this has been widely accepted. IPCC has therefore adopted the relatively simple FOD model as basis for the estimation of CH_4 emissions from SWDS.

Half-lives for different types of waste vary from a few years to several decades or longer. The FOD method requires data to be collected or estimated for historical disposals of waste over a time period of 3 to 5 half-lives in order to achieve an acceptably accurate result. It is therefore good practice to use disposal data for at least 50 years as this time frame provides an acceptably accurate result for most typical disposal practices and conditions. If a shorter time frame is chosen, the inventory compiler should demonstrate that there will be no significant underestimation of the emissions.

Three tiers to estimate the CH_4 emissions from SWDS are described:

- Tier 1: The estimations of the Tier 1 methods are based on the IPCC FOD method using mainly default activity data and default parameters.
- Tier 2: Tier 2 methods use the IPCC FOD method and some default parameters, but require good quality country-specific activity data on current and historical waste disposal at SWDS. Historical waste disposal data for 10 years or more should be based on country-specific statistics, surveys or other similar sources. Data are needed on amounts disposed at the SWDS.
- Tier 3: Tier 3 methods are based on the use of good quality country-specific activity data (see Tier 2) and the use of either the FOD method with (1) nationally developed key parameters, or (2) measurement derived country-specific parameters. The inventory compiler may use country-specific methods that are of equal or higher quality to the above defined FOD-based

Tier 3 method. Key parameters should include the half-life, and either methane generation potential (L_o) or DOC content in waste and the fraction of DOC which decomposes (DOCf).

A spreadsheet model has been developed by the IPCC to assist countries in implementing the FOD: IPCC Spreadsheet for Estimating Methane Emissions from Solid Waste Disposal Sites (IPCC Waste Model). The IPCC Waste Model is described in more detail below and can be modified and used for all tiers.

3.9.2 Key underlying assumptions and parameters for projections

Framework horizontal assumptions

In the following section the assumptions on macroeconomic and demographic developments, as well on developments of international fossil fuel prices are presented, which are the same across the entire modelling framework. These are assumptions that describe the broader context in which the analysis is undertaken. They are common to all scenarios and the entire modelling framework.

International fuel prices

World fossil fuel prices projections, for crude oil (price of Brent), natural gas (European average price of imports) and imported coal (average price of imports in Europe), are exogenously assumptions to the modelling suite used within this project and are shown in Figure 19 .

The projection of world fossil fuel prices for the scenario is based on the E3M world energy model[51] Prometheus. This is consistent with the price projection which was used for the EU reference scenario 2016[52]. As the EU reference scenario exercise was conducted in 2016, some adjustments to were undertaken for the short-term projection until 2020, so as to incorporate the latest developments and statistical data on international fuel prices. The revision of the short-term projection took into account forecasts proposed by various experts. For this purpose, E3M collected a series of very recent projections, notably by the World Bank, the US EIA, the IEA, IMF, OECD and several private firms (Barclays, Deloitte, Morgan Stanley, Raymond James, Piper Jaffray, Goldman Sachs, and others). The updated short-term forecast involves prices lower than the prices included in the EU Reference scenario of 2016. The revised projection converges to the EU Reference 2016 projection, from 2025 onwards.

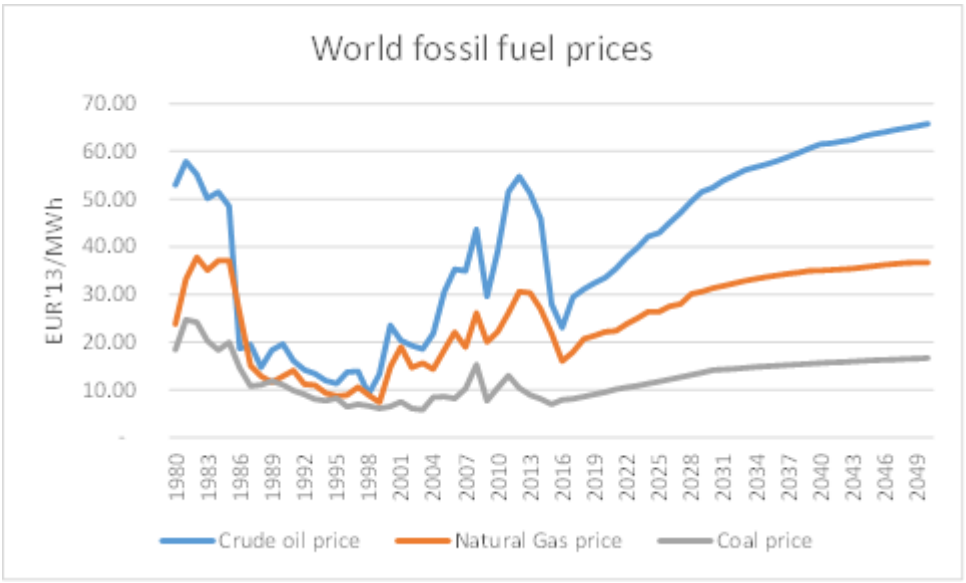


Figure 19: World fossil fuel prices, historical and projections; Source: Prometheus model (E3M)

[51] PROMETHEUS is a world stochastic energy system model developed and maintained by E3-Modelling staff. The model manual is available at http://147.102.23.135/e3mlab/PROMETHEUS%20Manual/The%20PROMETHEUS%20MODEL.pdf

[52] The final report for this scenario is available in https://ec.europa.eu/energy/sites/ener/files/documents/20160713%20draft_publication_REF2016_v13.pdf.

Demographic

The population growth is based on the medium variant population estimates from the Serbian Statistical office; this population projection is the same throughout the modelling framework of this project: GEM-E3, PRIMES, CAPRI and IPCC waste.

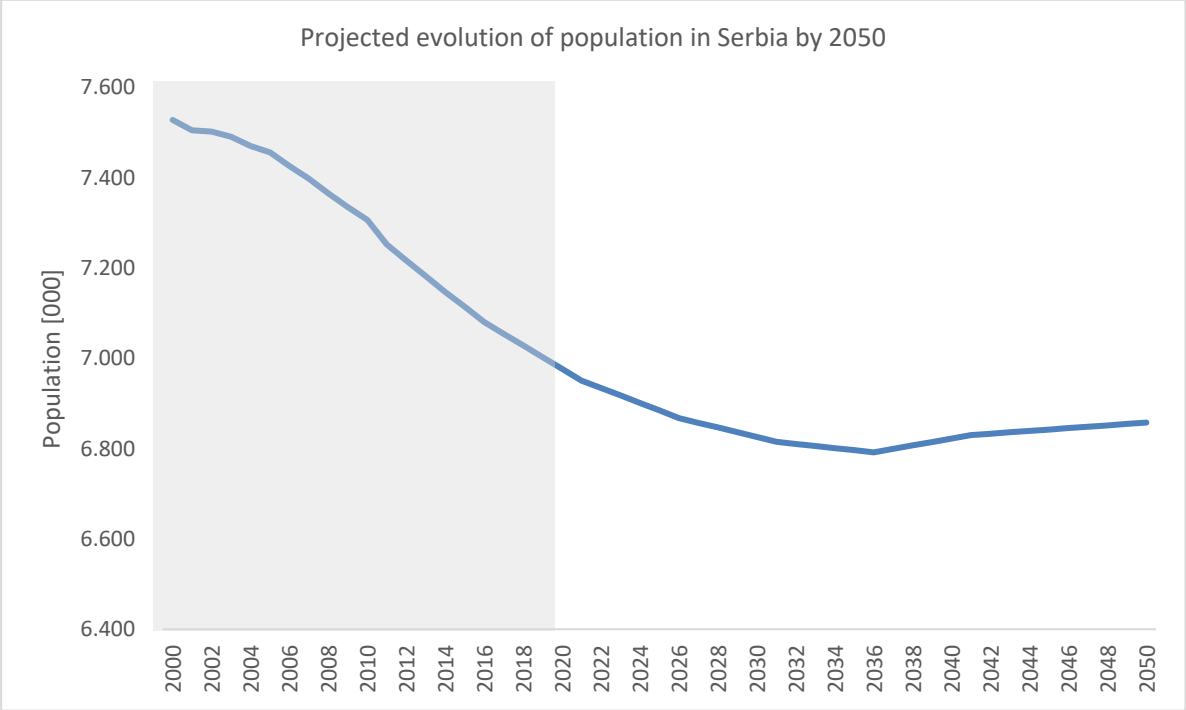


Figure 20: Projection of population in Serbia by 2050

GEM-E3- Modelling Assumptions

The GEM-E3-Serbia model is a recursive dynamic CGE model that is built on the GEM-E3 model[53] and simulates the Serbian economic system until 2050 in five-year time steps. All countries in the model are linked through endogenous bilateral trade transactions; labour markets representation allows for unemployment by skill and transport and power generation are represented in a bottom-up approach. The development of the baseline scenario is made using the latest available projections from IMF for the short term whereas a sustainable growth path is assumed for the long term. The development of a consistent baseline projection for an economy is a quite complex task as GDP growth can follow different patterns (i.e. it can be export or investment driven) and attributed to different growth mechanisms (i.e. technical progress, population growth, capital accumulation). In this respect the GEM-E3-Serbia model has been used to quantify a baseline projection where the growth of Serbian GDP is consistent in terms of accounting (i.e. for each transaction both the demand and supply is defined) and transparent (growth is mapped onto specific drivers that are directly measured). It should be noted that the baseline projection is not a forecast but a projection reflecting current trends based

[53] Capros et al (2013). The GEM-E3 model is a global, multi-regional, multi-sectoral, recursive dynamic computable general equilibrium (CGE) model which provides details on the macro-economy and its interaction with the environment and the energy system.

on fully updated data. In addition, the baseline scenario provides a plausible outlook of the macroeconomic system of Serbia that is based on specific and verifiable macroeconomic and technological assumptions.
The quantification of the baseline scenarios with the GEM-E3 is based on a set of assumptions regarding the:

- Evolution of technical progress and labour productivity,
- Public budget policy,
- Energy and climate policies and
- Population growth.

Evolution of Technical Progress and Labour Productivity: One of the key drivers of growth in the GEM-E3 model is technical progress and labour productivity. The labour productivity of the Serbian economy is presented in Figure 21. The key trend in the growth of labour productivity is that it will surpass the EU average until 2050. The labour productivity assumed is consistent with the population projections of the statistical office and the projections of declining unemployment rate until 2050.

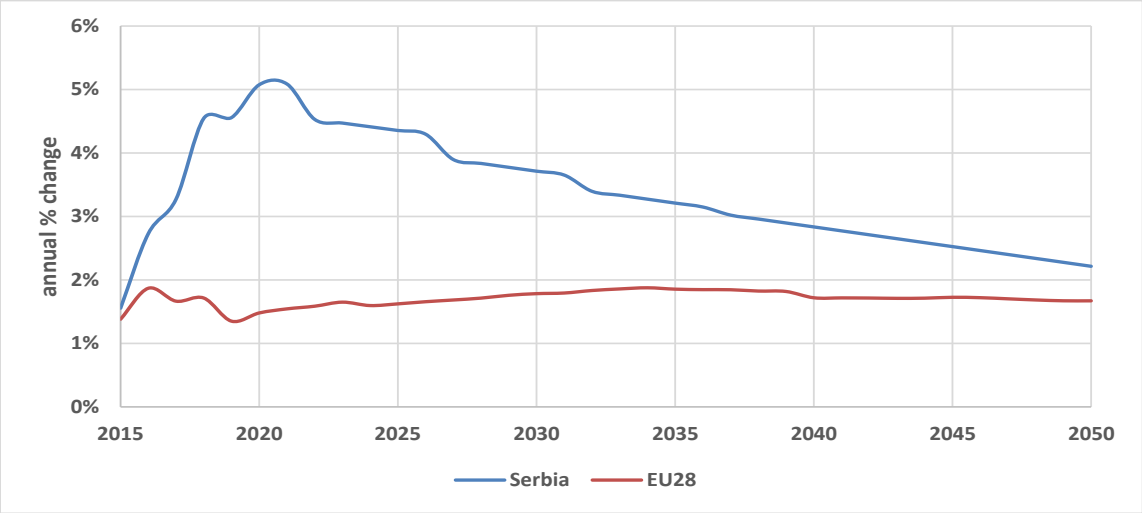


Figure 21: Long term labour productivity in Serbia; Source: E3M

Public Budget: Until the global financial crisis the fiscal deficit of the Serbian economy was moderate and public debt declined significantly. Since the start of the global economic and financial crisis in 2008 Serbia fiscal control has underperformed delivering high fiscal deficits. In the economic baseline scenario quantified by the GEM-E3 model it is assumed that in the longer-term fiscal control will be improved together with the economic growth of Serbia and hence a public surplus is projected leading to a sustainable public debt. The dynamic calibration of the GEM-E3 macroeconomic projection is based on the assumption that countries record a sustainable output growth rate, where for example excessive current account deficits or surpluses are gradually eliminated. This assumption is compatible with a zero output gap, as the output gap suggests that the economy operates in an inefficient manner.

Energy and climate policies: The energy and climate policies included in the model are those included in the PRIMES model are the one form standard PRIMES library excluding the use of Nuclear power.

Population and labour force: The macroeconomic baseline assumptions build on recent demographic and aggregate economic projections for Serbia provided by the Statistical Office of Republic of Serbia (SORS). As for all the modelling framework, the population growth is based on the medium variant population estimates from the Serbian Statistical office whereas the labour force growth is based on the assumption of slightly increasing participation rate from 63.6% in 2015 to 64.8% in 2050.

GEM-E3 OUTPUT as PRIMES INPUT

The growth of the Serbian economic system is the output of the analysis using the GEM-E3 model, which is then fed as an input to the PRIMES energy system model.
It includes calculation of GDP in constant prices, calculation of value added by sector using a decomposition in 23 sectors (of which three services sectors, agriculture and 16 industrial sectors), expenditure of households for private consumption (used as a proxy of income), labour force and unemployment rate.
The short-term GDP projections (up to 2021) have been based on IMF[54] where an average yearly 3.5% is projected for the period 2017 - 2021. For the projection of the long-term GDP the GEM-E3 model has been used taking into account the growth of the world economy and in particular the growth of the main trading partners of Serbia (EU28, Russia, Turkey) and trends in labour productivity and population projections available by the SORS.

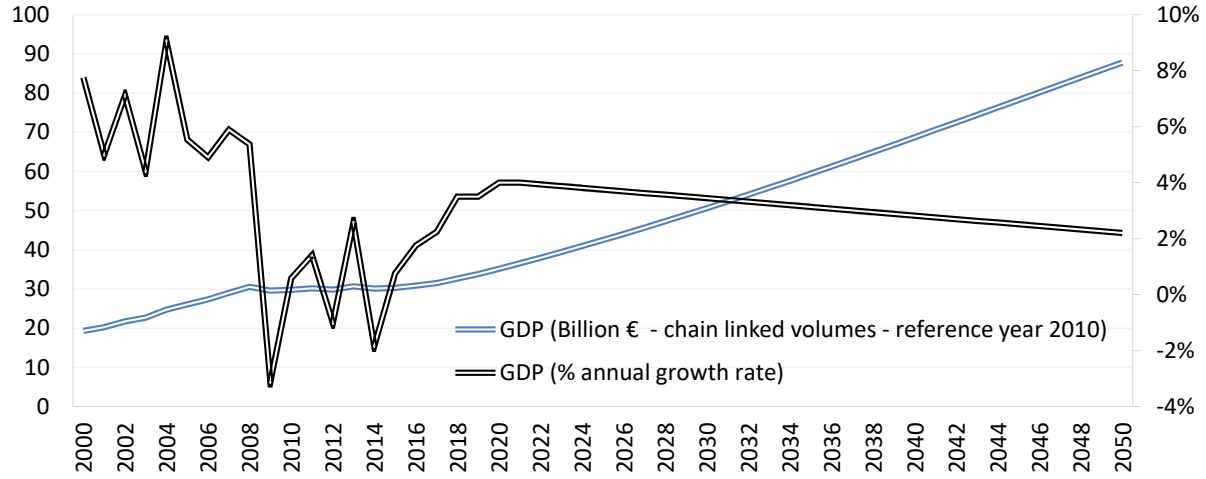


Figure 22: Serbia, GDP growth; Source: Statistical data up to 2015, GEM-E3-Serbia

In addition, the long-term growth needs to take into account the change in the composition of GDP (i.e. reduction of the share of consumption, increase of the share of investment and reduction of the trade deficit). The increase of the share of gross fixed capital formation in GDP increases also the demand for imported capital goods which burden the trade balance. Hence in order to reduce the deficit exports need to increase driven by accelerated technical progress and improved competitiveness.

[54] World Economic Outlook, April 2016.

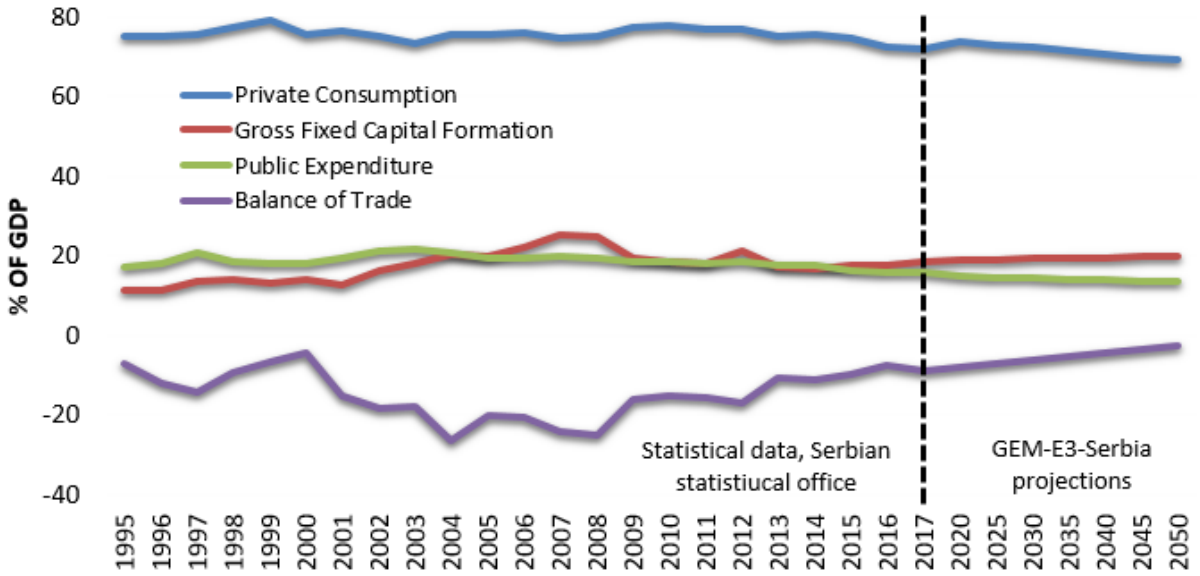


Figure 23: Serbia, GDP components; Source: Statistical data up to 2015, GEM-E3-Serbia

In terms of sectoral composition, the Serbian economic system is projected to transform towards a higher value-added structure that is less carbon and energy intensive towards a service-based economy. The same projection regarding GDP, sectoral value added and population is shared across all scenarios of the analysis and is shown in Table 17 and Table 18.

Table 17 Main macroeconomic and sectorial projections-1/2

Average annual rates of change in volume terms	2000-2008*	2009-2013*	2014-2016	2017-2023	2024-2030	2031-2050
Population	-0.27	-0.50	-0.47	-0.33	-0.19	0.02
GDP	5.90	0.07	0.21	3.58	3.63	2.79
Agriculture	1.79	0.45	-1.90	0.66	1.52	0.42
Construction	9.57	-4.83	0.96	3.48	3.60	2.69
Services	5.21	-0.11	0.83	3.96	3.92	3.01
Metals	1.66	-15.49	-24.32	12.52	3.23	2.35
Chemicals	-2.58	1.78	3.75	3.90	3.46	2.31
Building Materials	-1.31	-6.15	-0.22	4.15	3.12	2.44
Rest of Industry	1.56	3.33	-0.95	3.22	3.44	2.71
Private consumption per capita	7.26	0.03	0.70	3.70	3.60	2.54

*historical trends

Table 18: Main macroeconomic and sectorial projections-2/2

Shares in total value added in volume terms (%)	2000*	2015*	2020	2030	2040	2050
Agriculture	11.73	9.47	8.35	6.65	5.26	4.18
Construction	4.31	5.15	5.14	5.13	5.10	5.04
Services	57.06	62.30	63.45	65.65	67.26	68.69
Industry & energy	26.90	23.08	23.06	22.57	22.38	22.10
of which Metals	0.92	0.14	0.25	0.24	0.24	0.22
of which Chemicals	1.89	1.33	1.37	1.36	1.33	1.24

Shares in total value added in volume terms (%)	2000*	2015*	2020	2030	2040	2050
of which Building Materials	1.48	0.67	0.73	0.70	0.65	0.65
of which Rest of Industry	22.60	20.94	20.73	20.27	20.16	19.98

Source: GEM-E3-Serbia model

Notes:

For population the rate of change is calculated as change of number of persons

For GDP, private consumption and the figures by sector the rates of change are calculated as changes of EUR in constant money and constant currency terms

The sectorial data represent rates of change of value added in constant EUR and shares of value added over total value added (GDP in factor prices), all in constant EUR.

The external economy projections (for EU28, Turkey, Russia, China and the Rest of the World - RoW) are based on the following sources:

- For the period 2015-2019 the IMF "World Economic Outlook", Oct 2014.
- For the period 2020-2050 the trends of IEA "World Energy Outlook" are broadly followed and GDP growth projections from CEPII used in POLES global scenarios also taken into account.
- Population projections are based on the medium fertility scenario of UN Population Prospects, 2012.

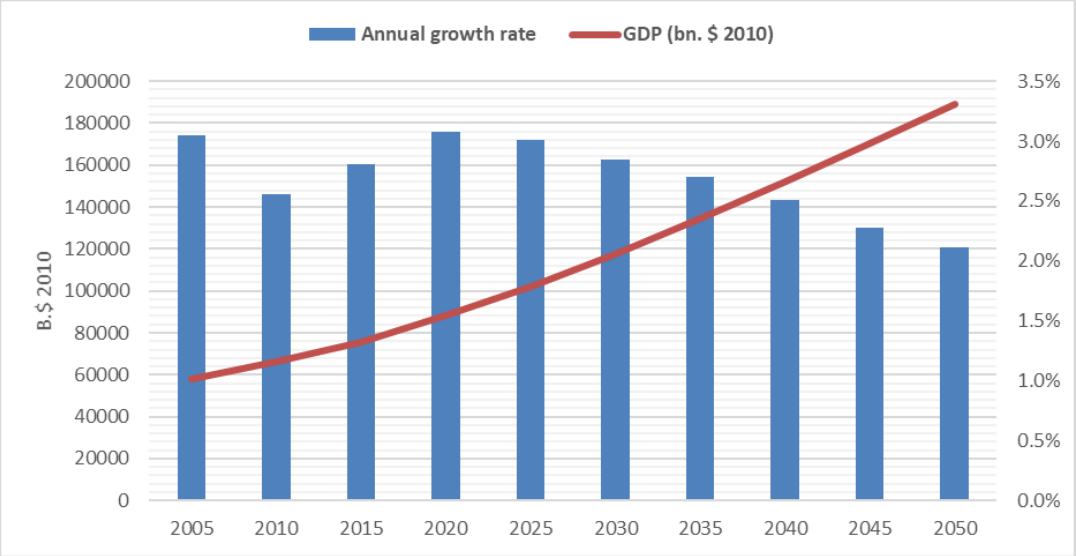


Figure 24: World GDP growth; Source: Statistical data up to 2015, GEM-E3-Serbia

For the number of households' projections (2020-2050), E3M used the statistical data available following recent trends and the population projections provided by the RSO. The calculations with the GEM-E3 model ensure the consistency between numbers of households, population, disposable income and household consumption. The PRIMES residential sector does not include unoccupied dwellings and vacated houses as they do not impact residential energy consumption. The number of households depends on the projection of the number of persons per household, which should reflect the current social trends; for Serbia in particular, it has been assumed that the number of persons per households will decrease over time. The average surface of households is also an input to the PRIMES model, and it has been projected into the future assuming strong correlation with growth of private income, using an elasticity higher than one. The key demographic projections are shown in Figure 25 below.

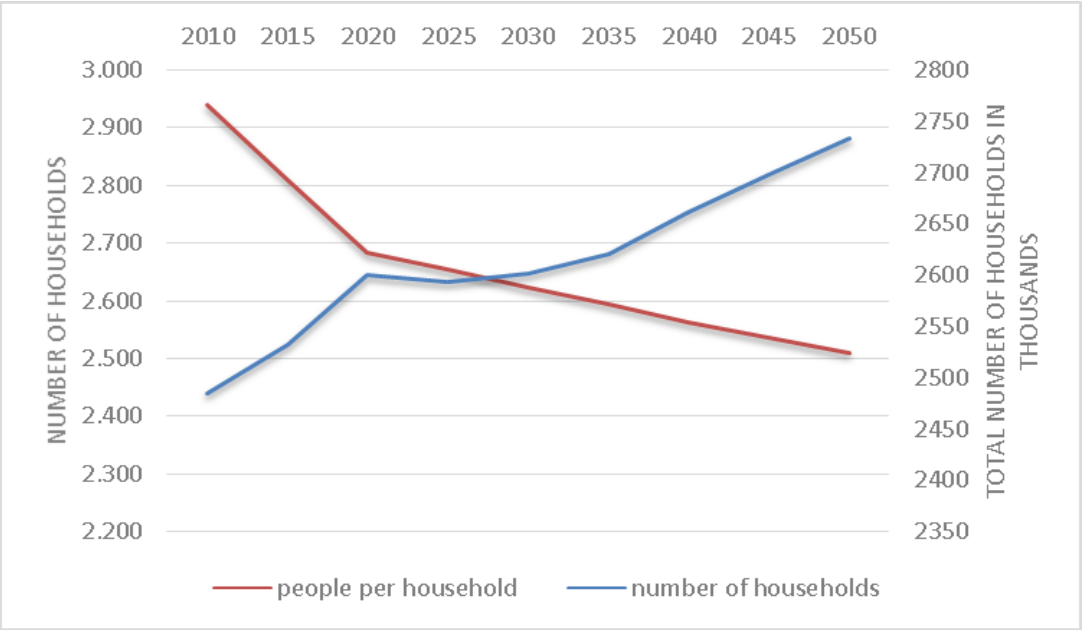


Figure 25: Projection of number of households and its composition; Source: E3M

3.9.3 Assumptions on policies and measures included in the WEM and WAM scenarios

Assumptions for the Energy sector

Macro-economic, demographic and international fuel price assumptions

All mitigation and baseline scenarios share the same projection of GDP, population and economic activity by sector.

All scenarios are built on the same projections of world fossil fuel prices, which are an updated version of the price projection used in the official EU Reference 2016 scenario of the European Commission[55]. The updates reflect the latest available information and trends of international fuel prices.

The use of the same assumptions related to macro-economic, demographic and international fuel price assumptions allow for full comparability amongst the results of the scenarios.

ETS carbon price (or equivalent national taxation) assumptions

In all four mitigation scenarios developed for this project the price for GHG emissions is implemented assuming an exogenous path of carbon prices.

Power generation and RES

The scenarios assume the same exogenous investments until 2020 as assumed for the WOM scenarios:

[55] The "EU Reference Scenario 2016 – Energy, transport and GHG emissions - Trends to 2050"publication report describes in detail the analytical approach followed, the assumptions taken and the detailed results, https://ec.europa.eu/energy/sites/ener/files/documents/ref2016_report_final-web.pdf

The fossil power plants, particularly the lignite power plants in Serbia are assumed to have to comply with the Large Combustion Plants Directive (LCPD).
The mitigation scenarios assume a progressive reduction of the market and non-market barriers for RES deployments, through the implementation of policies (e.g. priority access, streamlined authorisation for licensing and approval procedures), allowing for a larger share of the technical/economic potential of Serbian RES to be tapped.

- In WEM scenario a limited number of additional policies are assumed to be implemented, these however continue to limit the potential; the RES potential has been limited for the WEM scenario based on numbers provided by the Serbian Ministry of Mining and Energy.
- In WAM scenario, policies are assumed to be in place which allow for the elimination of barriers, allowing the RES deployment to follow only economic considerations without market or non-market barriers. The RES potential is therefore the technical/economic potential for the country and is enhanced/limited by economic considerations alone (techno-economic prices of RES technologies compared to competitive technologies under the assumed ETS prices or equivalent domestic carbon taxation).

In terms of potential per type of technology, the technical/economic potential of wind power for Serbia is assumed to be limited to the numbers provided by the Ministry of Mining and Energy, as there was no literature supporting additional availability of sites in Serbia.
For solar PV however the technical/economic potential, particularly of roof-top PV is considered to be substantially higher. This has been based on data from global solar atlases and own estimations, due to the lack of Serbia literature sources for the estimation of the potential.

Table 19: Potentials for wind and solar power assumed for Serbia in the mitigation scenarios

	WEM	WAM
General assumption	Capped RES potentials	Full techno-economic potential available
Wind	4 221 MW	4 221 MW
Solar PV (land mounted and rooftop)	3 000 MW	13 124 MW

Energy markets across Europe, including Serbia in these scenarios are expected to implement all provisions of the Third Energy Package and relevant EU Network Codes developed for the electricity and gas markets, promoting the adoption of common rules for allocation of cross border capacity, promoting the development of regional and EU wide markets.

Stationary demand side

On the demand side the changes are driven by the progressive implementation of the full EU Acquis: the implementation of the EPBD as well as the EED progressively reduce the barriers for building renovation and increase the compliance rate with these norms. These norms imply that new buildings will be zero energy buildings and an exemplary role for the public sector, as well as increasing renovation thanks to the penetration of ESCOs which progressively reduce the risk as perceived by the final consumers and users, as risk is diffused in groups of customers.
The higher efficiency of appliances is driven by the implementation in Serbia of the EU eco-design and energy-labelling directives and respective regulations which result in faster uptake of highly efficient appliances and elimination of less efficient technologies. Energy efficiency is considered a strong pillar in all scenarios, as it strongly reduces energy demand, with different levels of ambition per scenario.
In the industrial sector the national policies and measures implemented up to end 2015, provide significant long-lasting results, considering that industrial sector is exposed to international competition. Industrial sector should promote and implement upgrading projects, and employ modern technology to retain its competitive edge, otherwise an increased additional deindustrialization process should be expected. In WAM, as well as in the other mitigation scenario, it is assumed that

necessary measures for the modernization of the industrial sector are adopted, including efficiency related investments resulting significant reduction in energy and CO_2 intensity.

Transport sector

For the transport sector, the GDP growth and increased motorization are the key drivers for increased transport activity and modal choices.
The transport sector is expected to contribute to the achievement of the climate targets via strong GHG emissions cuts, through electrification of cars and light commercial vehicles (LCVs) and increased use of advanced biofuels, driven by the adoptions of the CO_2 standards for cars and vans. In the scenarios the standards are assumed to progressively become stricter (from WOM no standards, to WAM very strict standards), therefore promoting an always stronger driver for electric vehicles.
The penetration of electric vehicles is expected to be supported by the synchronous expansion of the recharging infrastructure with significant time delay (10-15 years) compared to the EU. Biofuels are also expected to develop, following EU trends. The biofuel industry will develop following the obligations of the EU RES directive, therefore first-generation biofuels will be progressively replaced with advanced biofuels; these will be used mainly for sectors which cannot (or are difficult to) be electrified, particularly long-distance road freight transportation and aviation. Rail is assumed to be progressively fully electrified, following a Serbian implementation of the 4th Railway Package[56].

Assumptions for the IPPU

For Industrial Processes it is assumed that the provisions of the IPPC Directive on Best Available Technologies are applied and reflected upon the technical (hence economic) characteristics of new technologies in all sectors, mainly reflecting the expected reduction of emissions from these processes. For all mitigation scenarios the same technologies and techniques are assumed to be adopted, and further mitigation options have not been analysed in the framework of this project.
The following assumptions were integrated into the mitigation scenarios WEM and WAM
Prohibition of placing on the market of:

- Non-refillable containers for fluorinated greenhouse gases used to service, maintain or fill refrigeration, air-conditioning or heat-pump equipment, fire protection systems or switchgear, or for use as solvents
- Non-confined direct evaporation systems that contain HFCs and PFCs as refrigerants
- Fire protection equipment that contains PFCs that contain HFC-23
- Windows for domestic use that contain fluorinated greenhouse gases
- Other windows that contain fluorinated greenhouse gases
- Footwear that contains fluorinated greenhouse gases
- Tyres that contain fluorinated greenhouse gases
- One-component foams, except when required to meet national safety standards, that contain fluorinated greenhouse gases with GWP of 150 or more
- Aerosol generators marketed and intended for sale to the general public with GWP of 150 or more
- Domestic refrigerators and freezers that contain HFCs with GWP of 150 or more is fully implemented and effective by 2020

In addition, Scenarios WEM and WAM assume that the prohibition of products and equipment as listed in will be fully respected and implemented

[56] The 4th Railway Package is a set of 6 legislative texts designed to complete the single market for Rail services (Single European Railway Area).
Additional information available at: https://ec.europa.eu/transport/modes/rail/packages/2013_en

Table 20: Assumed prohibition of products and equipment for all mitigation scenarios

Products and equipment	Products and equipment	Date of prohibition[57]
Refrigerators and freezers for commercial use (hermetically sealed equipment)	that contain HFCs with GWP of 2 500 or more	01-Jan-20
	that contain HFCs with GWP of 150 or more	01-Jan-22
Stationary refrigeration equipment, that contains, or whose functioning relies upon, HFCs with GWP of 2 500 or more except equipment intended for application designed to cool products to temperatures below – 50 °C		01-Jan-20
Multipack centralised refrigeration systems for commercial use with a rated capacity of 40 kW or more that contain, or whose functioning relies upon, fluorinated greenhouse gases with GWP of 150 or more, except in the primary refrigerant circuit of cascade systems where fluorinated greenhouse gases with a GWP of less than 1 500 may be used		01-Jan-22
Movable room air-conditioning equipment (hermetically sealed equipment which is movable between rooms by the end user) that contain HFCs with GWP of 150 or more		01-Jan-20
Single split air-conditioning systems containing less than 3 kg of fluorinated greenhouse gases, that contain, or whose functioning relies upon, fluorinated greenhouse gases with GWP of 750 or more		01-Jan-25
Foams that contain HFCs with GWP of 150 or more except when required to meet national safety standards	Extruded polystyrene (XPS)	01-Jan-20
	Other foams	01-Jan-23
Technical aerosols that contain HFCs with GWP of 150 or more, except when required to meet national safety standards or when used for medical applications		01-Jan-18

Assumptions for the Agriculture sector

National and European policies and regulations are considered in the CAPRI model approach for Serbia as long as they directly influence market decisions. For example, if certain emission reductions are politically forced by regulations or promoted by subsidies, these have impacts on the agricultural market. By contrast if direct payments are distributed to farmers in decoupled form, a direct influence on market production does not exist.

The National Agriculture and Rural Development Strategy of the Republic of Serbia for the Period 2014-2024[58] does not specifically aim at the reduction of GHG emissions. It is assumed that such GHG reductions will become more important in the following period, so that the application of potential mitigation measures starts from 2030 onwards in the modelling with CAPRI.

[57] Annex III of F-gases regulation No 517/2014/EC

[58] https://pravno-informacioni-sistem.rs/eli/rep/sgrs/vlada/strategija/2014/85/1

Concerning climate adaptation measures, it has been assumed that adaptation measures would be largely successful to counteract the early impacts of climate change in the crop sector (to be experienced up to 2050).
In the framework of EU pre-accession assistance for rural development (IPARD) 175 million Euro has been allocated for the years 2014-2020, in form of grants.
The Serbian authorities have selected four main measures that will be supported with these EU grants comprising investments in physical property of agricultural holdings, in processing and marketing of agricultural products, diversification of agricultural holdings and business development and technical assistance.
Investments in agricultural holdings and in processing and marketing of agricultural products improve the farm productivity and have some impact on agricultural markets. It is assumed in CAPRI scenarios set up that IPARD support will continue also in the period 2020-2024 and will gradually become more effective.
A number of regulations of the EU's common agricultural policy (CAP) are assumed to be affecting the agriculture sector in Serbia. These are described below, together with explanations what kind of effects may be expected and therefore need consideration in the modelling.
The "CAP Reform 2013 regulations: Rural Development (1305/2013), 'Horizontal' issues (1306/2013), Direct payments (1307/2013)[59] and Market measures (1308/2013)" sets out the rules for direct payments made to support farmers under the CAP. These payments are made on the condition that farmers meet rules on the health and welfare of people and animals, plant health and the environment — known as cross-compliance. EU countries must dedicate a certain proportion of their CAP funding allocation to compulsory support schemes such as standard per-hectare payments, green payments per hectare and young farmer per-hectare payment for current EU member states. In the CAPRI modelling they are basically treated as fully decoupled payments, meaning that they are considered in income accounting but otherwise have negligible effects. This is because virtually all agricultural areas are eligible for these payments and therefore the relative profitability of them is hardly affected. We assumed that this will also apply to Serbia when it gradually becomes eligible for these payments and their decoupled nature is in essence preserved in future CAP reforms.

The CAP Reform 2006/144/EC focuses on three key areas of the future rural development policy. (a) Measures for the agrifood economy target human and physical capital in the agriculture, food and forestry sectors (promoting knowledge transfer and innovation) and quality production. (b) Environmental measures protect and enhance natural resources in Europe's rural areas. (c) Measures for the broader rural economy and population target at the development of local infrastructure and human capital in rural areas. Establishing the link from these locally granted rural development measures to the market level is difficult and hence they are only considered in the income and budgetary calculations but have otherwise no effect on the baseline results.
The Nitrates Directive 1991/676/EEC is one of the most cited features of EU environmental policy already applied since 1991. It aims to reduce water pollution from nitrates used for agricultural purposes and to prevent any further pollution. EU countries are obliged to designate as vulnerable zones all those draining into waters which are or could be affected by high nitrate levels and eutrophication. EU countries also have to establish and monitor action programs for these areas. The mandatory measures of these action plans are the following[60]:

[59] The Council Regulation (EC) No 73/2009 established common rules for direct support schemes for farmers. The decoupling of direct support from production has been extended and the functioning of the single payment scheme has been simplified for current EU members.
[60] http://ec.europa.eu/environment/water/water-nitrates/index_en.html

- national limitations for the periods when nitrogen fertilizers can be applied on land in order to target application to periods when crops require nitrogen and prevent nutrient losses to waters;
- national limitations of the conditions for fertilizer application on steeply sloping ground, frozen or snow-covered ground, near water courses, etc. to prevent nitrate losses from leaching and run-off;
- requirements for a minimum storage capacity for livestock manure;
- crop rotations, soil winter cover to prevent nitrate leaching and run-off during wet seasons;
- measures such as limitation of fertilizer application (mineral and organic), taking into account crop needs, all nitrogen inputs and soil nitrogen supply;
- maximum amount of livestock manure to be applied (corresponding to 170 kg nitrogen /hectare/year).

The precise specification of the previously mentioned list of mandatory measures within nitrate vulnerable zones is left to the EU Member States. It is assumed that Serbia will also designate a non-negligible share of its territory as nitrate vulnerable, specify a national adaptation of these mandatory measures, and, over time, also finance and train an appropriate number of civil servants to monitor these measures. For the whole territory, i.e. including non-vulnerable zones, the Nitrates Directive requires that a code of good agricultural practice be established which farmers apply on a voluntary basis. It sets out various good practices, such as when fertilizer use is inappropriate, supported by training and information for farmers.

Taking into account the complexity in its implementation, the Nitrates Directive is expected to have some impact in the scenario calculation from 2030 onwards. It is expected that the Nitrates directive will operate towards a somewhat reduced nitrogen intensity and that it will stimulate a more widespread application of winter cover.

The LULUCF Decision No 529/2013/EU as amended sets out accounting rules applicable to emissions and removals of greenhouse gases resulting from land use, land-use change and forestry (LULUCF), as a first step towards the inclusion of those activities in the Union's emission reduction commitment. It sets out the obligation for Member States to provide information on their LULUCF actions to limit or reduce emissions and to maintain or increase removals.

Accounting of greenhouse gases in the shape of the LULUCF regulation has already started in Serbia. Some of the data collected have been used for the CAPRI model.

Assumptions for Forestry

A key assumption has been identified for the mitigation scenarios for the forestry sector: that all currently existing forest policy is fully implemented. In particular it is assumed that there will be political and institutional stability conducing to the full implementation of the policy framework, including on the establishment and management of the financial instruments to promote implementation.

Such mentioned policies, include:

- The Spatial Development Strategy of Serbia, which, for the field of forestry, determines an increase in forest covered areas (through afforestation) in accordance with the global division into districts and categorization of space. In these terms, afforestation by 2020 is supposed to cover an area of 90.000 ha or 9.000ha per year.
- Law on spatial plan of the republic of Serbia for period 2010-2020 stipulates that optimal area under the forests until year 2050 should be 41,4% of the total area of Serbia
- National sustainable development strategy and its Action plan set up an objective, where one of them is an increase of area under the forest to 29% of the territory of Republic of Serbia to year 2015.
- Forest Development Program for Autonomous Province of Vojvodina (FDPAPV) entered into force in 2015 and defined activities such as afforestation, conversion of coppice forests into

high forest, and fire protection. FDPAVP envisages afforestation in the amount of 10 735 ha for 10 years or around 1074 ha annually.

It is also assumed that a new National Forest Program will be adopted with more ambitious objectives and with clear and sustainable measures, instruments, and monitoring indicators. These objectives should at least be as follows until 2050:

- 300 ha annually of planting coniferous into regeneration of pure broadleaves forests
- 7000 ha annually of coppice forest to be converted in high forests
- Afforestation on forest land in amount of 5000 ha annually defined in NFP
- Establishing of 1500 ha annually of short rotation plantation
- Felling beech over mature stands in amount of 5000 ha a year/annually
- Establishing adequate Extension service according to the needs of owners on local level
- Promotion of establishing Associations with focus on those owners which have bigger interest for association
- Defining Forestry policy measures directed toward new “urban forest owners”
- Introduction of the risk management approach into forest management regarding climate change challenges
- Introduction of “Climate smart forestry" approach in forest sector in Serbia
- Adjusting and producing new curricula at education institutions mainly in forestry sector – addressing climate change
- Updating of cadastre regarding land use category and easy transformation towards available category of land for afforestation
- Preparation and implementation of better control mechanisms in forestry, in order to prevent illegal activities on felling and degradation of forest ecosystems

It is finally assumed that the full implementation of the adaptation measures prioritized will ensure protecting the estimated mitigation potential from the impacts of climate change.
The stakeholder workshop held in the process of scenario development developed a short list of measures for adaptation to the impacts of climate change. Based on the adaptation options for the forestry sector contained in the National Communication (NC), these measures are prioritized as follows:

1. Afforestation of new land using site mapping and CC adapted tree species
2. Change of forest management practices toward Close to nature forest management approach
3. Introduction of “Climate smart forestry" approach
4. Promotion of uneven-aged forests and mixed forests structure
5. Establishing of research and monitoring system of CC effects (pathogens, forest fires, water balance level) and early treatment of pathogens and forest fires
6. Selection of new varieties of trees resistant to CC
7. Rehabilitation of stands damaged by abiotic and biotic factors and fire-damaged stands
8. Construction of new forest roads and fire protection forest roads in fire-prone regions
9. Improvement of water resource management
10. Establishing of proper Short Rotation Production
11. Conversion of coppice into high forests
12. Introduction of agroforestry especially in lowlands

As these measures all have mitigation benefits, they are all included in the mitigation scenario, as single measures or as combination of different measures.

Assumptions for Waste sector

Municipal solid waste assumptions

Two key assumptions for the modelling of GHG emissions in the waste sector are the waste composition and the full implementation of the extensive agenda of EU approximation activities as a part of preparing of Serbia for the EU membership.
In order to develop a scenario, projected amount and composition of municipal waste in Serbia for period 2015 - 2050 was considered, assuming that the future characteristics of the waste by the end of 2050 will be changed in line with change of two key drivers, i.e. GDP and population growth/decrease. In other words, models for projection of the physical characteristics of the waste for the Republic of Serbia until 2050, were based on correlation between waste amount & composition with GDP and population. Projection of MSW generation in future period in Serbia used for modelling is shown in Table 22[61].

Table 21: Projection of MSW generation in Serbia (2025-2050) assumed in the waste modelling

Year	kg/cap/day	kg/cap/year	t/year
2025	1.02	373.69	2,723.507
2030	1.07	390.20	2,858.095
2035	1.11	406.71	2,993.964
2040	1.16	423.23	3,131.123
2045	1.20	439.74	3,269.580
2050	1.25	456.25	3,409.347

The amount of waste generated in Serbia in the period from 2015 to 2050, is projected to increase by 38.7%, which corresponds to approximately 1.1% per year. This means that the amount of municipal waste generated in the period from 2015 to 2050 will increase from 340.7 kg to 456.3 kg/capita/year. The results related to the projected composition of municipal waste, shows that share of biodegradable categories consisting of garden and food waste, will be reduced by 21.9% in 2050. The projections indicate the following shares in 2050,

- food and garden: 40%
- paper and cardboard: 11.2%,
- plastic 15.5%,
- glass 6.6%
- metal 2.4%,
- all other: 24.3%.

The Republic of Serbia is preparing for the EU membership, which encompasses the transposition and implementation of EU environmental acquis, including requirements for waste management. Crucial legislative obligations include:

- Landfill Directive - 1999/31/EC (as amended),
- Directive on packaging and packaging waste - 94/62/EC (as amended) and
- Waste Framework Directive - 2008/98/EC (as amended).

Key items defined in the mentioned Directives require the EU Member State (MS) to meet certain targets regarding material recycling and the diversion of biodegradable waste from landfills. Countries like Serbia, which are applying to become an EU Member State can deviate from the EU objectives during the negotiation process, but the defined goals will be active as soon as negotiations for membership begin.
The Republic of Serbia's regulation in the waste management sector is partly harmonized with EU legislation and its defined goals. This means that the EU acquis for the waste sector is already

[61] IMG - Municipal Waste Information containing a model to forecast the quantities (yearly) of household and similar, waste generated in each region of Serbia, 2015

transposed into Serbian waste policy framework. WOM Scenario considers that crucial legislative is fully applied, and that all goals will be reached in the defined period.
In this context, the waste baseline scenario (WOM) meets the criteria of the WEM scenario (transposition of EU Acquis) and, therefore, for the waste sector there is no difference between the WOM Scenario and the WEM mitigation scenario.
The WOM/WEM scenario assumes harmonization of Directives and achievement of goals, in realistic framework and in line with real situation on the ground. Derogation from goals set up in Directives in terms of time needed for the respective implementation was taken into consideration, corresponding to the state of the socio-economic conditions in Serbia, and considering speed of implementation for other Member States that later joined the EU.
In the scenario WOM/WEM realistic possibilities for achievement of mentioned goals in accordance with the current level of infrastructure and current situation, as well as previous experience in level of infrastructure development in the waste management regions in Serbia, were taken into account.
For scenario WOM/WEM an assessment of the current level of the existing infrastructure and the established waste management systems in the regions in Serbia was performed, coupled with an assessment of the capacity to, in a realistic time frame, certain regions can be fully functional and having all the necessary elements and treatment facilities (sanitary landfill, recycling and biological/thermal treatment plants), in order to achieve the EU's goals.
In that sense, the starting point was the assessment of the region's level of infrastructure construction, performed in the scope of the draft Waste Management Strategy Revision from 2014, which was for the purpose of developing Scenario WOM/WEM updated in line with the changes in the field to the present, and the projection of the realistic possibilities for further infrastructure development in each of the observed regions. Such updates for WOM/WEM also considered the draft Directive Specific Implementation Plan provided by Ministry of Environment, where level of future development and required investments for each waste management region in Serbia was estimated.
Based on the estimation of the necessary time for each individual region to have a complete waste management system in compliance with EU requirements, it was projected how much the waste, by type, will be properly treated in relation to the time.
Taking the above into consideration, Table 23 describes the assumed waste treatment options and targets that were input to the IPCC 2006 Waste Model for WEM Scenario.

Table 22 : Biodegradable waste treatment options and targets assumed for WOM/WEM

Relevant waste fractions for GHG emissions	Treatment option		Targets to be achieved			
			2025	2030	2040	2050
Food and garden waste	Landfilling		85%	75%	55%	35%
	Diversion	Composting	15%	25%	45%	65%
Paper and cardboard	Landfilling		85%	75%	55%	35%
	Diversion	Recycling	10%	15%	25%	45%
		Composting	5%	10%	10%	10%
		Incineration	5%	10%	10%	10%

Table 24 describes the assumed waste treatment options and targets that were input to the IPCC 2006 Waste Model for WAM Scenario.

Table 23: Biodegradable waste treatment options and targets assumed for WAM Scenario

Relevant waste fractions for GHG emissions	Treatment option		Targets to be achieved			
			2025	2030	2040	2050
Food and garden waste	Landfilling		85%	55%	25%	0%
	Diversion	Composting	15%	35%	55%	85%

Relevant waste fractions for GHG emissions	Treatment option		Targets to be achieved			
			2025	2030	2040	2050
		Anaerobic digestion	0%	5%	10%	15%
Paper and cardboard	Landfilling		85%	65%	35%	25%
	Diversion	Recycling	10%	25%	40%	60%
		Composting	5%	10%	15%	20%
		Incineration	5%	10%	10%	10%
Total enhanced waste prevention (i.e. waste reduction) of about 2% per year						

Waste water treatment assumptions

The construction dynamic of wastewater treatment facilities is conducted according to a predetermined order based on size of the city and number of its population connected to wastewater collection and discharge system.

This scenario also omits industrial wastewater GHG emission. According to this scenario it is assumed that facilities for anaerobic digestion of wastewater will start operating as a mitigation measure of GHG emissions reduction.

The assumption is that, by 2050 in the Republic of Serbia, 95 % of the major cities will have anaerobic digestion facilities installed. Facilities in the rest 5 % of the cities would start with operation by 2062[62].

Table 24: Assumed expected year of connection of main Serbian cities to tertiary treatment facilities

City	Population	Year of connection to tertiary treatment facility
Belgrade	1,687,132	2018
Novi Sad	617,949	2020
Niš	364,157	2022
Kraljevo	305,954	2024
Sremska Mitrovica	300,988	2026
Kragujevac	284,957	2028
Pančevo	281,203	2030
Užice	271,080	2032
Kruševac	226,808	2034
Leskovac	203,254	2036
Čačak	202,026	2038
Jagodina	202,025	2040
Vranje	198,671	2042
Smederevo	189,091	2044
Zrenjanin	177,308	2046
Sombor	175,347	2048
Požarevac	170,207	2050
Valjevo	165,273	2052
Kikinda	138,371	2054
Bor	114,816	2056
Zaječar	109,634	2058
Pirot	85,964	2060
Prokuplje	85,287	2062

[62] Source: Serbian Water Management Strategy

Cities of Subotica and Šabac are not being considered as they already have implemented wastewater treatment facilities to their sewerage systems. According to this dynamic, 83.4 % of population of Republic of Serbia would be connected to wastewater treatment systems by 2050. The rest of the cities that would not be covered by wastewater treatment facilities by 2050 (16.6 % of population) are shown in Table 25. The table also shows the year of treatment facility installation if the same dynamic would be applied. If cities of Subotica and Šabac are taken into consideration, the percentage of population covered by wastewater treatment system would rise to about 90 %.

3.9.4 Changes in the methodology since the Party's most recent biennial transparency report

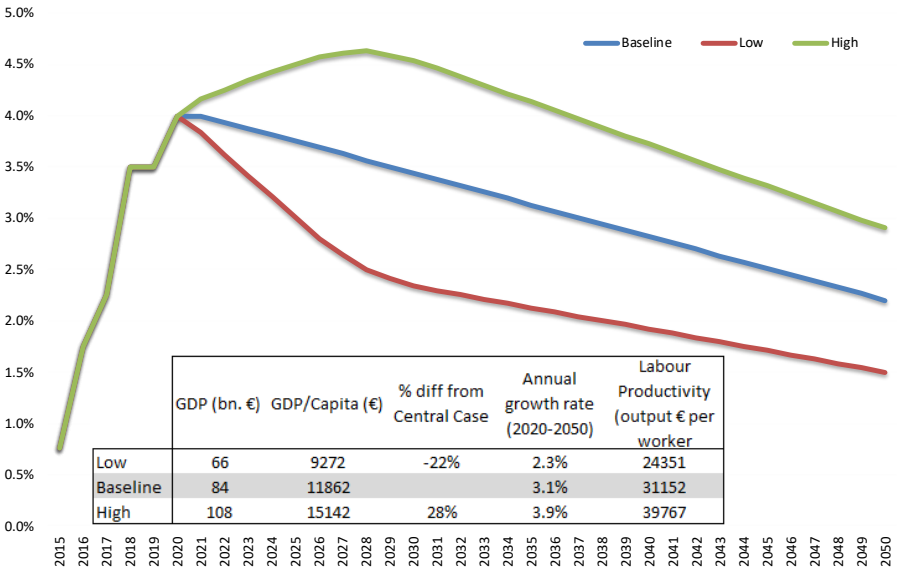
Not applicable

3.9.5 Sensitivity analysis for any of the projections, together with a brief explanation of the methodologies and parameters used.

Main Drivers for Sensitivities

Two sets of sensitivity analyses were carried out to assess how changes in the main drivers would affect the outcome of the scenarios. The following two key drivers were chosen:

1. **Economic growth**: In addition to the baseline used for the main analysis, two extremes regarding the speed of GDP growth rate are considered. The high GDP growth scenario is considered as a high labour productivity case where income grows at an average annual rate of 3.9% and GDP is 28% higher than the baseline case in 2050. Respectively in the low productivity scenario income decreases by 22% as compared to the baseline case. These two variants allow to capture the extremes under which the Serbian energy system may need to develop. shows the annual growth rates for the variants and the respective implied labour productivities.



	GDP (bn. €)	GDP/Capita (€)	% diff from Central Case	Annual growth rate (2020-2050)	Labour Productivity (output € per worker
Low	66	9272	-22%	2.3%	24351
Baseline	84	11862		3.1%	31152
High	108	15142	28%	3.9%	39767

Figure 26: GDP growth rate: Baseline, High and Low cases

2. **Fossil fuel prices**: The current projection of world fossil fuels prices is consistent with the central scenario of IEA. A low and high price scenario have been considered. The low fossil fuels scenarios reflect a future where the energy system is characterised by world-wide low GHG emissions and the demand for fossil fuels is limited. The high GDP case is characterised by high world-wide demand for fossil fuels and resulting high emissions.

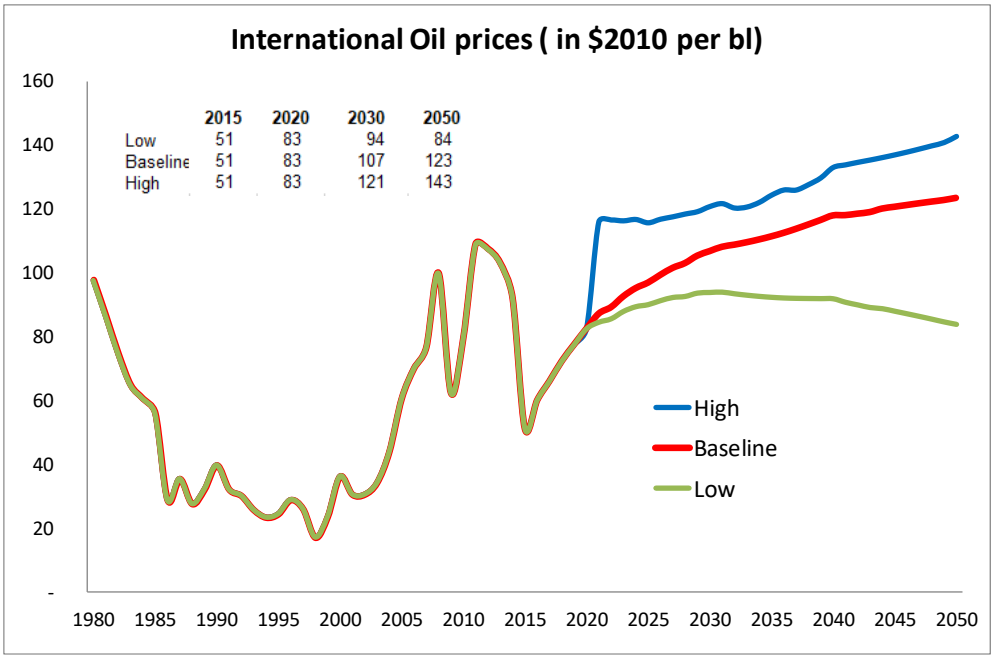


Figure 27: International oil prices, low Baseline and high growth rates

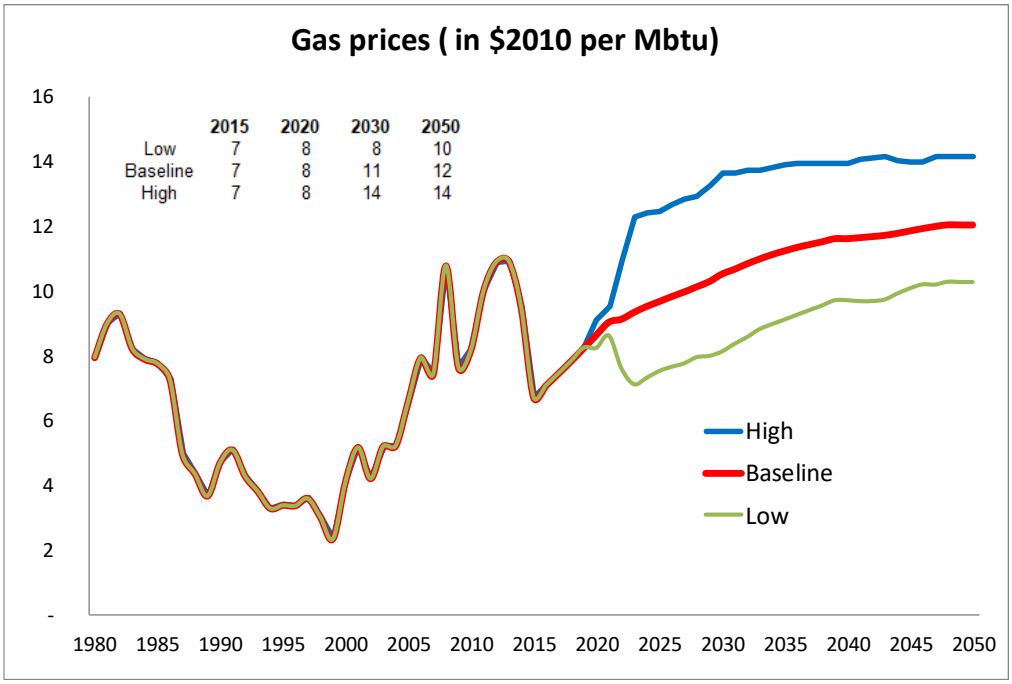


Figure 28: International gas prices, low Baseline and high growth rates

3. ETS prices or equivalent taxation: Two variants of the WEM scenario are developed, providing for a high and a low ETS price scenario (Figure 29). The low ETS price scenario reflects the ETS prices applied in the EU Reference scenario 2016, and a high ETS scenario applying the prices of the WAM scenario. The purpose of these variants is to identify the impact of the ETS price (or equivalent national carbon taxation), to the development of the energy systems, which applies nevertheless the same policies of the two sensitivities.

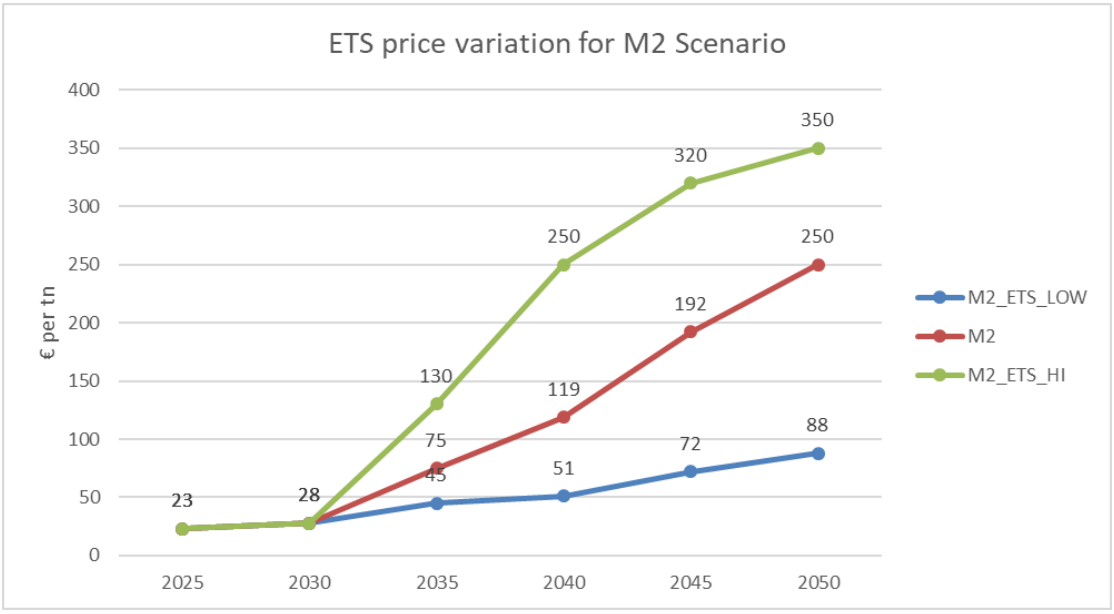


Figure 29: ETS price variants (or equivalent National taxation) applied in the WEM scenario

The sensitivity analysis was conducted on the basis of the WEM scenario, with the objective to identify the impact of the changes of three main drivers (GDP, ETS and International Fuel Prices) for scenario WEM, which is the less intensive decarbonization scenario developed. This scenario includes measures in the domestic and tertiary sector as well as the transport sector, which obviously are closely related with the ability and the willingness of the consumer to consume, which is reflected in GDP variations.
Regarding the international fuel prices, mainly the prices of natural gas are affecting the overall cost of the energy and heat sector and the transport sector, accelerating or decelerating the penetration of natural gas in the energy mix of Serbia, in power and heat generation.
ETS prices (or equivalent national carbon taxation) are evidently a crucial factor with a major impact on the ETS sectors and especially power generation, and the impact is twofold:

a) evaluation of the overall cost of the system having a linear relation to the price of the ETS, and
b) the evaluation of the impact of the ETS price on economic decisions to be taken by the energy market participants.

GDP Variation – Results Sensitivity analysis

Two GDP evolution scenarios have been developed to perform the sensitivity analysis. These scenarios assume a different GDP evolution over the entire projection period. The abbreviation for the low-GDP scenario is WEM_LO_GDP, whereas for the high GDP scenario it is WEM_HI_GDP.
The GDP variation is reflected on the demand for energy in all sectors and the willingness of the economy to improve efficiency by investing in new technologies. Figure 30 provides the evolution of final demand in all quantified mitigation scenarios, as well in the two variations of the WEM regarding different GDP projections. The impact of lower demand in the WEM_LO_GDP scenario in the long term provides the same level of demand as the WAM(-) scenario, where the final demand is heavily impacted by the intensity of the measures in efficiency and especially in the domestic sector already applied in 2020. The WEM_HI_GDP follows similar trend as the WEM(-) scenario, in which demand is almost identical to the baseline WOM, while in the WEM_HI_GDP the applied policy measures are not sufficient to counteract the additional demand coming from the higher economic growth.

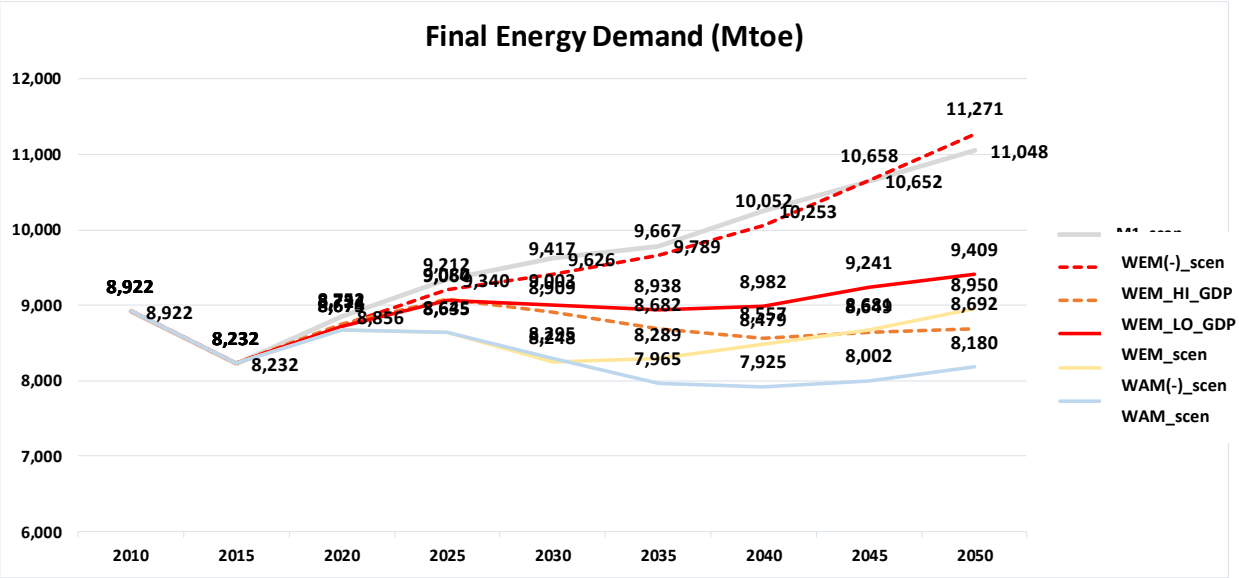


Figure 30 Final Energy Demand (Mtoe), in the GDP variants of the WEM scenario

The figure above provides the final energy demand projections for the WEM variant in the industrial, domestic and transport sectors; the effects of the changed GDP are mainly felt in the domestic and transport sectors, where the demand reduces due to lower availability of income. In the high GDP case, demand increases because of increasing demand for energy consuming products (more transport activity, higher and faster penetration of appliances).
The variations of the GDP have some effects also on other sectors such as Waste and to some extent on Agriculture the overall effects of the GDP variations is presented in Figure 31 below.

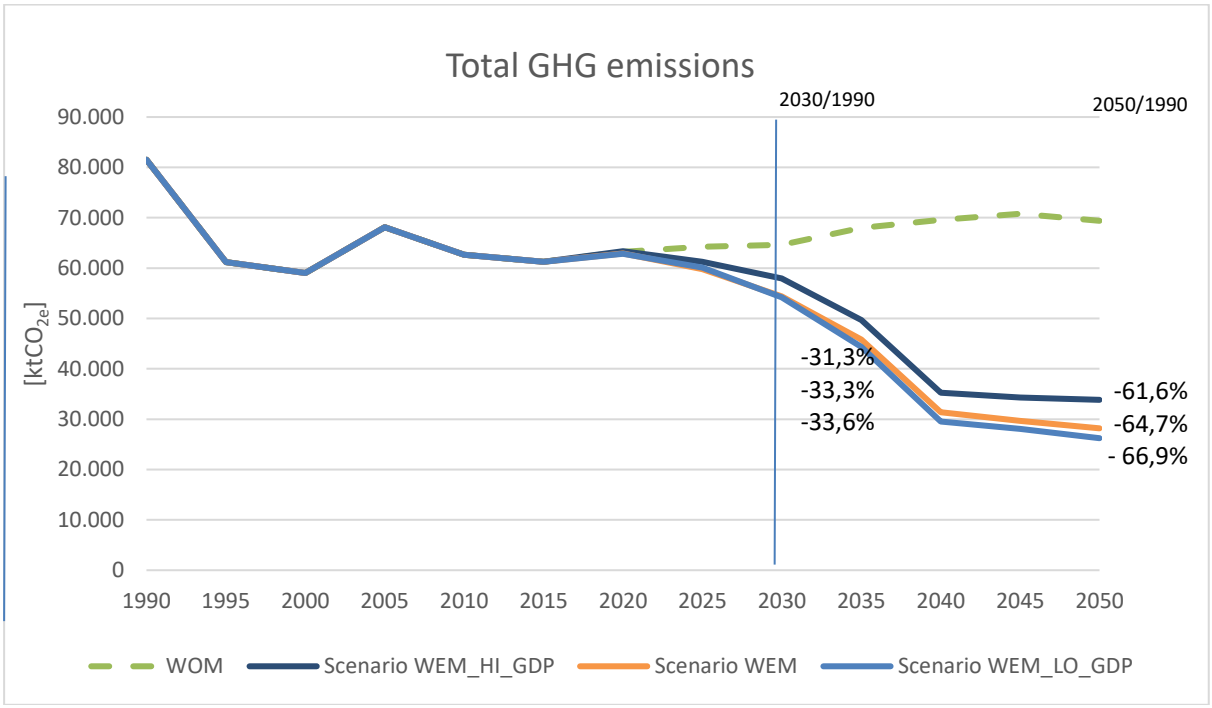


Figure 31 GHG Emissions (ktCO2e), in the GDP variants of the WEM scenario

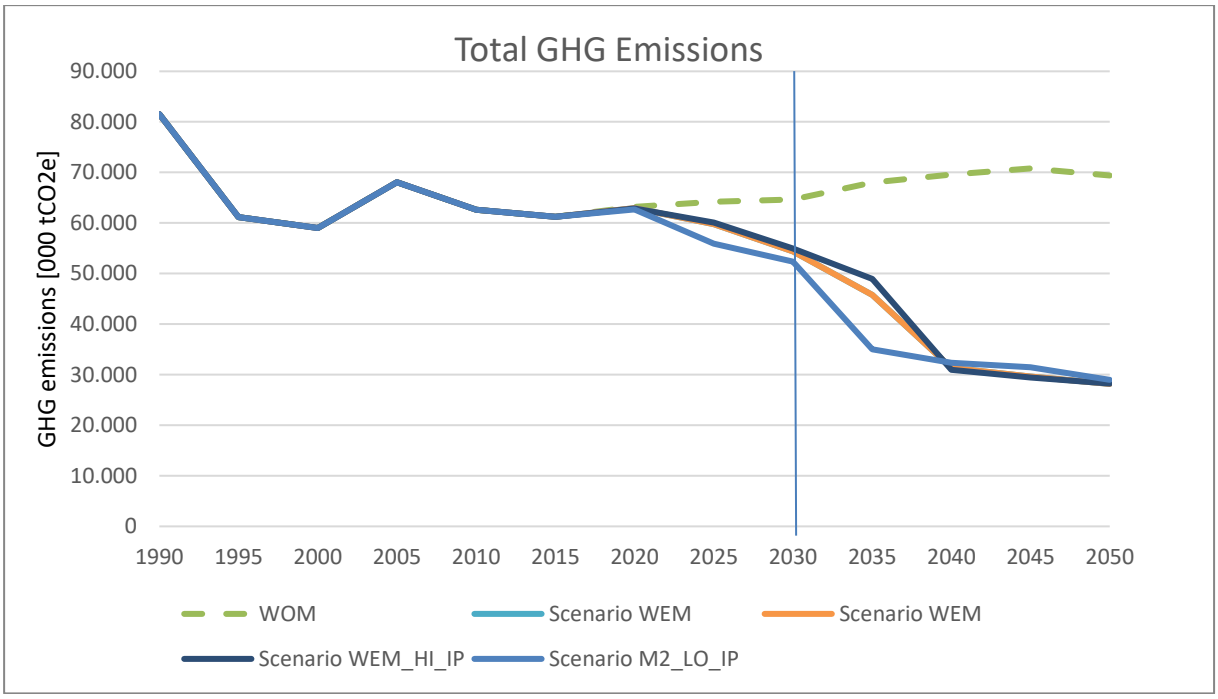


Figure 32 GHG Emissions ($ktCO_{2e}$), in the international fuel prices variants of the WEM scenario

Variation on the International fuel prices shows that low international fuel prices have similar effect on the midterm evolution of GHG emissions as high carbon prices or equivalent national carbon taxation, making domestic solid fuels less competitive and therefore the phasing out of those fuels is occurring faster.

3.9.6 Projections without measures (WOM/BaU)

GHG Emission levels in WOM scenario (with and without LULUCF) for base year, most recent years and the period 2030 - 2050 together with and changes compared to 2010 are presented in Table 26 and Figure 33. GHG emission will grow until 2050 (from 2022), temporarily stabilising in the period from 2040 to 2045 (replacement of existing lignite power plants with new and more efficient ones) followed by small decline in the period 2045-2050. Total possible reduction of emissions in 2050 according to this scenario, without LULUCF, is 1.9% compared to 2010 and 16.1% compared to 1990.

Table 25 GHG emissions and trends compared to 2010 and 1990 (kt CO2eq) - WOM

BaU/WOM	1990	2010	2022	2025	2030	2035	2050	2022/ 2010	2050/ 2010
Energy industries	42.713	31.850	32.087	34.188	34.590	37.695	37.472	0,7%	17,7%
Manufacturing industries and construction	7.833	5.504	3.590	4.062	4.014	3.628	3.837	-34,8%	-30,3%
Transport	4.560	6.728	8.167	7.822	8.354	8.690	9.518	21,4%	41,5%
Other sectors	7.086	3.506	3.340	2.660	2.677	2.707	2.532	-4,7%	-27,8%
Fugitive emissions	4.121	2.654	2.143	2.474	2.221	2.157	1.750	-19,2%	-34,0%
IPPU	5.516	4.972	5.141	5.384	5.671	5.952	6.608	3,4%	32,9%
Agriculture	6.538	5.552	4.866	5.046	4.752	4.965	5.721	-12,4%	3,0%
Waste	4.300	3.034	3.224	2.582	2.371	2.227	1.936	6,3%	-36,2%
Total BaU/WOM (without LULUCF)	**82.667**	**63.800**	**62.559**	**64.218**	**64.650**	**68.023**	**69.374**	**-1,9%**	**8,7%**
Totals BAU/WOM with LULUCF	81.255	57.741	58.010	58.767	59.600	63.195	65.213	0,5%	-31,3%

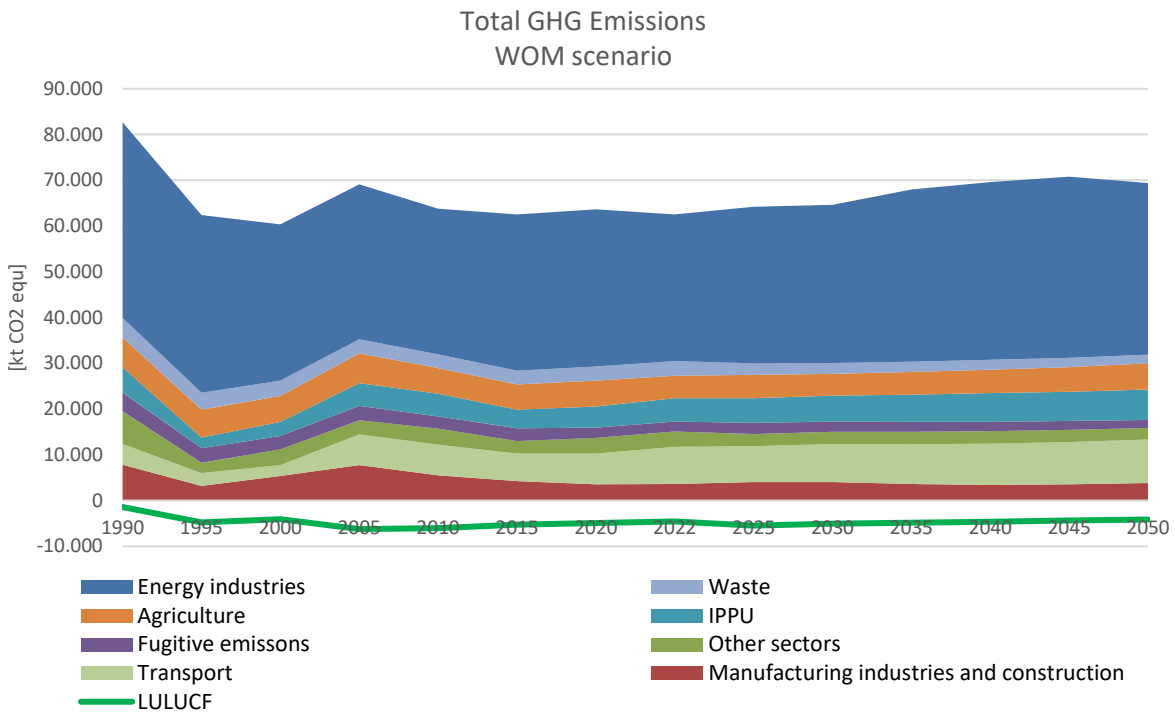
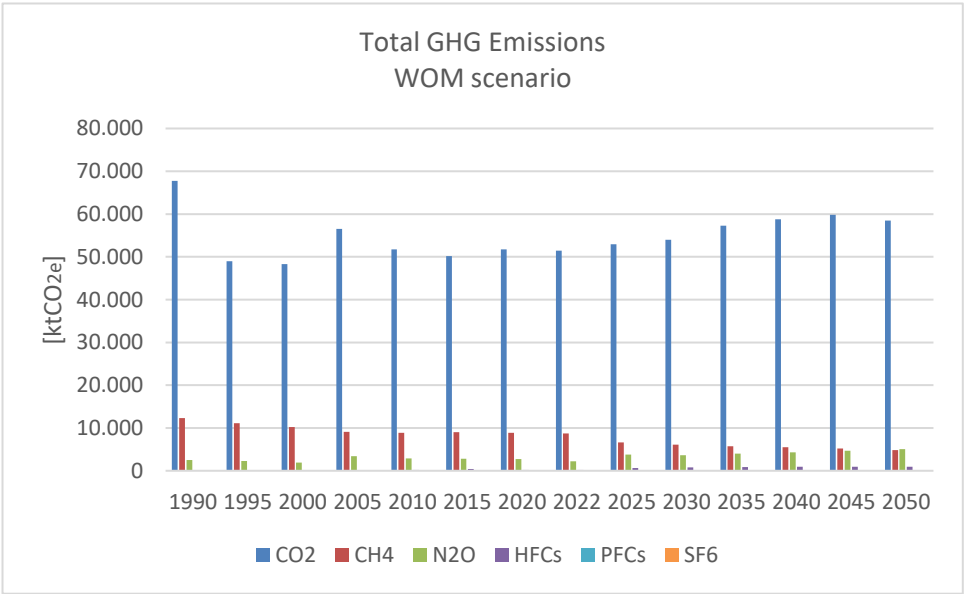


Figure 33 Evolution of GHG emissions by sectors according to WOM scenario

GHG emissions in the energy sector will rise, including the energy industry and transport subsectors (almost 50% of total 2050 emissions), in Agriculture and IPPU, while they will decrease in Other sectors.

Figure 34 Evolution of GHG emissions by gases according to WOM scenario



Among GHG gasses CO_2 remains predominant GHG in the structure of emissions in 2020 with around 82%, followed by CH_4 with 14% and N_2O with 4%, while F-gases represent less than 0,5% in total GHG emissions. Since the WOM scenario is not considering any structural changes in the Serbia the shares of GHG gasses are rather stable throughout the whole time series.

3.9.7 Projections with measures (WEM)

According to the WEM scenario, GHG emissions are expected to peak 2020, and have a declining trend until 2050 due to the implementation of Policies and measure in all sectors with exception of Waste sector. Emissions are by 2050 expected to drop by 65,9% compared to 1990 and 55,8% compared to 2010 (Table 27 and Figure 35). Domestic solid fuels are expected to be phased out gradually and replaced by Natural Gas and Renewable sources of energy. In IPPU emissions are also expected to reduce due to increased efficiency and convergence with EU BAT.

Table 26 GHG emissions and trends compared to 2010 and 1990 - WEM (kt CO2eq)

WEM	1990	2010	2022	2025	2030	2035	2050	2022 /2010	2050/ 2010
Energy industries	42.713	31.850	32.087	31.164	27.426	21.272	7.596	0,7%	-76,2%
Manufacturing industries and construction	7.833	5.504	3.590	4.101	3.651	3.228	2.691	-34,8%	-51,1%
Transport	4.560	6.728	8.167	7.406	7.433	6.726	4.731	21,4%	-29,7%
Other sectors	7.086	3.506	3.340	2.267	2.089	1.899	1.035	-4,7%	-70,5%
Fugitive emissions	4.121	2.654	2.143	2.279	1.938	1.413	220	-19,2%	-91,7%
IPPU	5.516	4.972	5.141	5.178	4.994	4.329	4.539	3,4%	-8,7%
Agriculture	6.538	5.552	4.866	4.813	4.493	4.694	5.432	-12,4%	-2,2%
Waste	4.300	3.034	3.224	2.582	2.371	2.227	1.936	6,3%	-36,2%
TotaL WEM (without LULUCF)	**82.667**	**63.800**	**62.559**	**59.790**	**54.396**	**45.788**	**28.180**	**-1,9%**	**-55,8%**
LULUCF	-1.412	-6.059	-4.549	-6.323	-6.576	-6.036	-4.414	-24,9%	-27,2%
Totals WEM with LULUCF	81.255	57.741	58.010	53.467	47.820	39.752	23.766	0,5%	-58,8%

The largest emission reductions in 2050 compared to 2010 can be expected in the energy sector, from the following areas:

- Energy industry (dominated by electricity and heat production) - by 76,2%; and
- Fugitive emissions from mining and post-mining activities as a result of market-initiated phase-out of coal - by 91.7;followed by:
- Manufacturing industries and construction - by 51.1%;
- Other sectors - by 70.5%;
- Waste management - by 36.2% due to the reduction of biodegradable waste; and IPPU – by 8.7%.

Emissions from transport and agriculture will also decline by 29.7% and 2.2%, respectively. It has to be noted that due to the investment capacity constraints and households remaining available budget the reduction of emissions are rather limited.

Main driver for emission reductions is GHG emissions is alignment with the EU Climate acquis, however the pace of the transition to low carbon society is delayed due to national circumstances and ability to invest in zero carbon technologies. The spill over effects from the EU policies and measure and ambition for full decarbonisation by 2050 will also significantly affect Serbia's ambitions to reduce emissions. The main challenge for Serbia's decarbonisation ambitions after 2045 will are emissions from Agriculture sector, where the demand for the food production is expected to strongly increase due to global demand for cereals and meat.

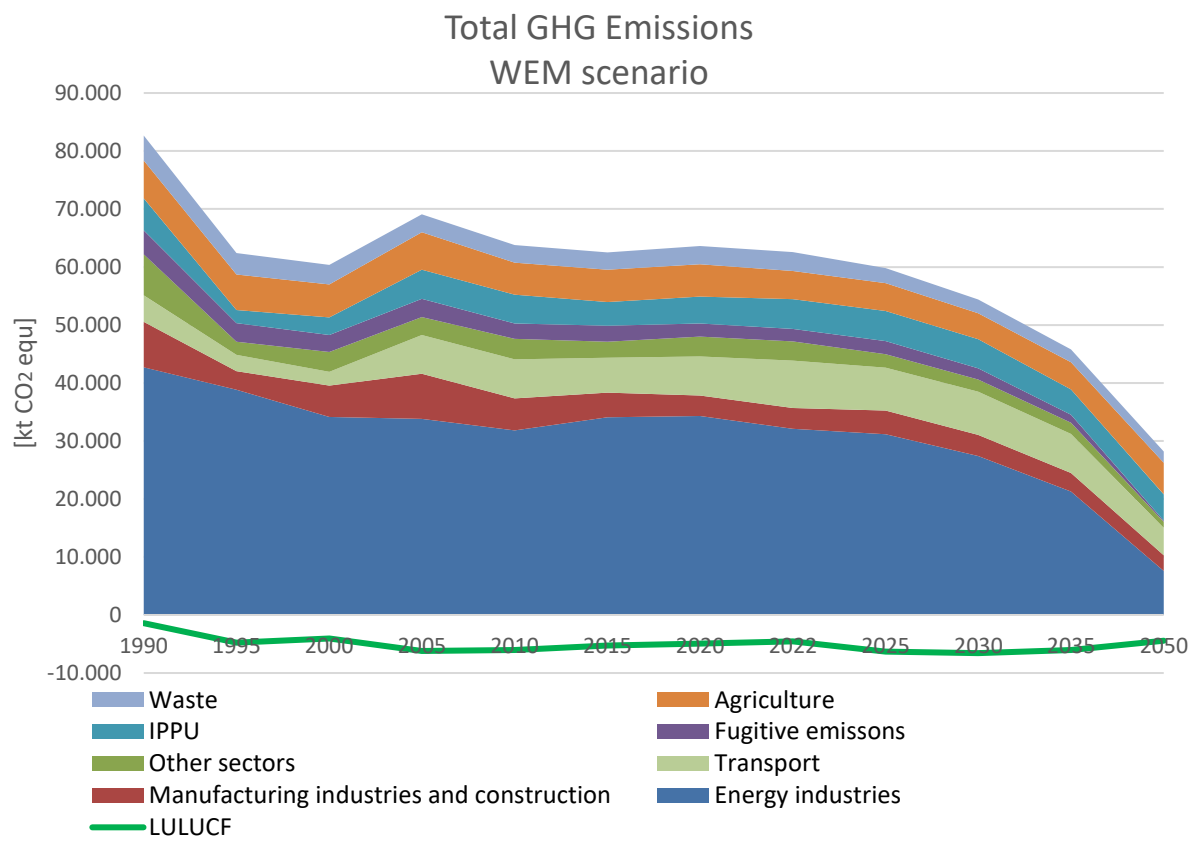


Figure 35: Evolution of GHG emissions by sectors according to WEM scenario

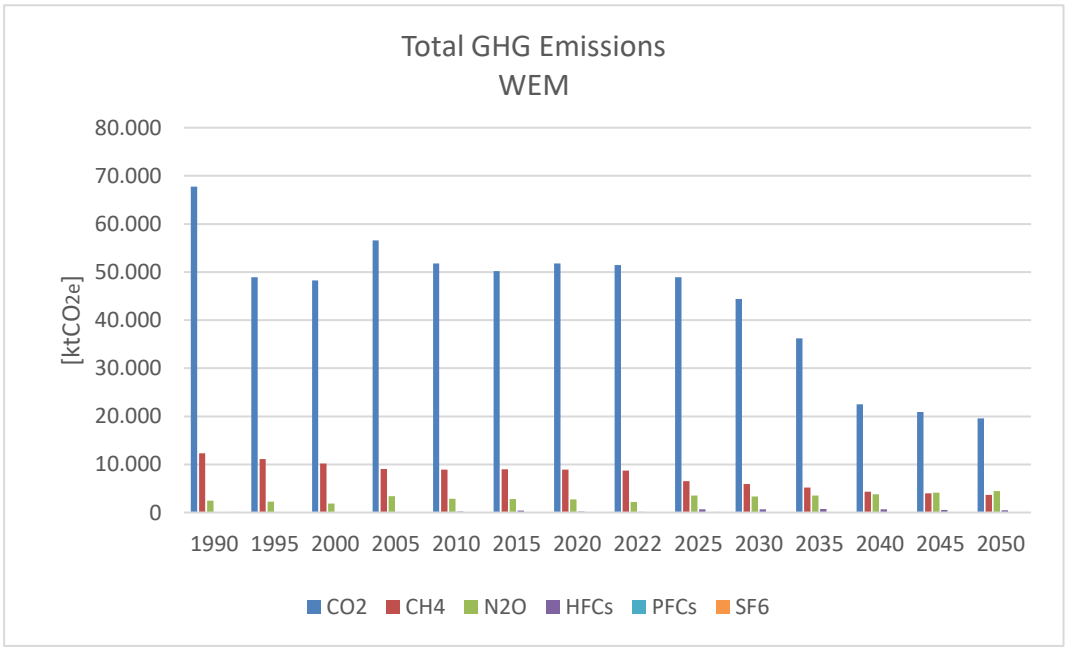


Figure 36 Evolution of GHG emissions by gases according to WEM scenario

Due to the structural changes in the WEM scenario the share of CO_2 in 2050 will be reduced to 69% while N_2O will represents 16% and CH_4 13% and Fgasses-2%.

3.9.8 Projections with additional measures (WAM)

As an EU candidate country, Serbia is aligning its legislation with EU legislation and policies. Thus, the WAM scenario is actually fully harmonized with the existing EU legislation, without taking the EU Green Deal into account. Therefore, the scenario started from the previously assumed reduction of EU GHG emissions by 80% compared to 1990. Taking into account national circumstances and available technologies, the WAM scenario projects a reduction in GHG emissions without removal through sinks (LULUCF) in 2050 by 76.6% and 69.6% compared to 2010 (Table 28). Determining the potential for achieving carbon neutrality should be the goal of the next modelling activities for Serbia.

The largest decline in GHG emissions in 2050 will be achieved by the Fugitive Emissions sector (-93.6%), then Energy industry (88.2%) assuming complete coal phase out, Other sectors (78.0%) and Waste Management (72.2%) as presented in the table below.

Table 27 GHG emissions and trends compared to 2010 and 1990 - WAM (kt CO2eq)

WAM	1990	2010	2022	2025	2030	2035	2050	2022/ 2010	2050/ 2010
Energy industries	42.713	31.850	32.087	27.995	22.824	6.314	3.767	0,7%	-88,2%
Manufacturing industries and construction	7.833	5.504	3.590	4.112	3.134	3.221	1.917	-34,8%	-65,2%
Transport	4.560	6.728	8.167	7.006	6.396	5.350	3.091	21,4%	-54,1%
Other sectors	7.086	3.506	3.340	2.115	1.996	1.574	772	-4,7%	-78,0%
Fugitive emissions	4.121	2.654	2.143	2.168	1.709	777	171	-19,2%	-93,6%
IPPU	5.516	4.972	5.141	5.167	4.625	3.992	4.787	3,4%	-3,7%
Agriculture	6.538	5.552	4.866	4.691	4.249	4.079	4.015	-12,4%	-27,7%
Waste	4.300	3.034	3.224	1.551	1.207	1.052	845	6,3%	-72,2%
TotaL WAM (without LULUCF)	**82.667**	**63.800**	**62.559**	**54.804**	**46.140**	**26.359**	**19.366**	**-1,9%**	**-69,6%**
LULUCF	-1.412	-6.059	-4.549	-8.424	-9.746	-10.580	-13.082	-24,9%	115,9%
Totals WAM with LULUCF	81.255	57.741	58.010	46.380	36.394	15.779	6.284	0,5%	-89,1%

The main constrain for further emission reduction from the Transport Sector is in infrastructure delay due to limited ability to invest and in purchase power of households. Phasing in of electric vehicles is due to the reasons presented above expected to have 15-20y delay compared to the EU phase out trajectory.

In Agriculture sector the effects of PaMs in the WAM scenario are limited therefore the expected emission reduction is only 27% compared to 2010 (38,6% compared to 1990). With existing know emission reduction options applicable in Serbia further emission reduction in Agriculture sector could be expected only through reduced demand on a global level.

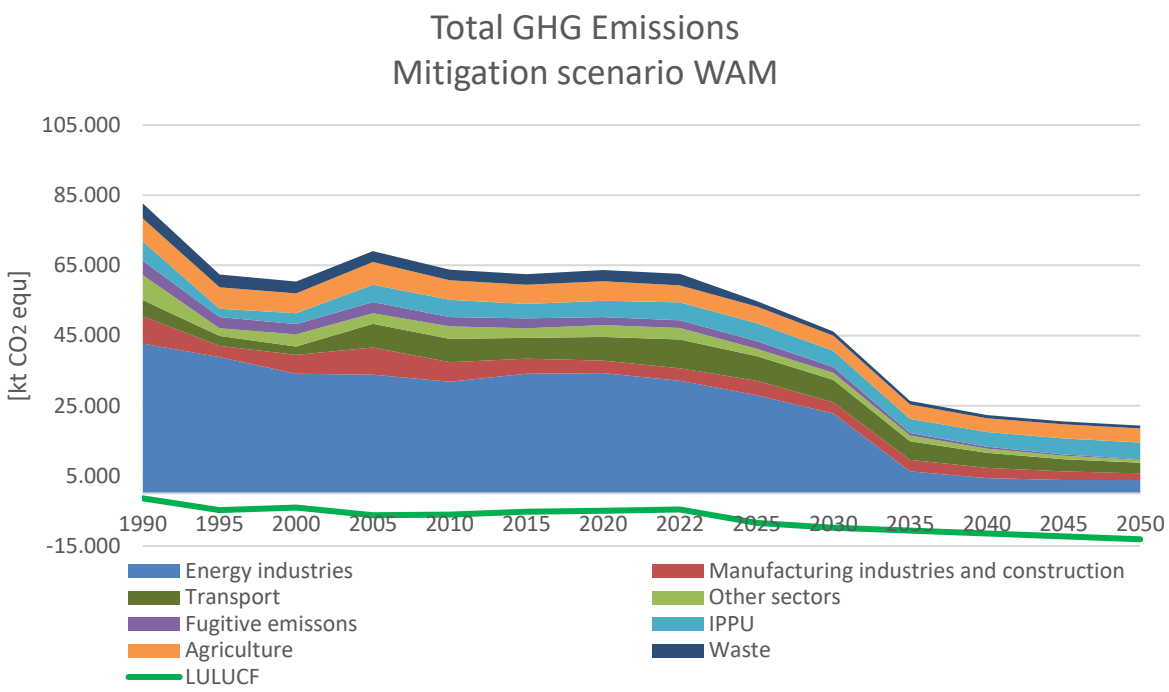


Figure 37 Evolution of GHG emissions by sectors according to WAM scenario

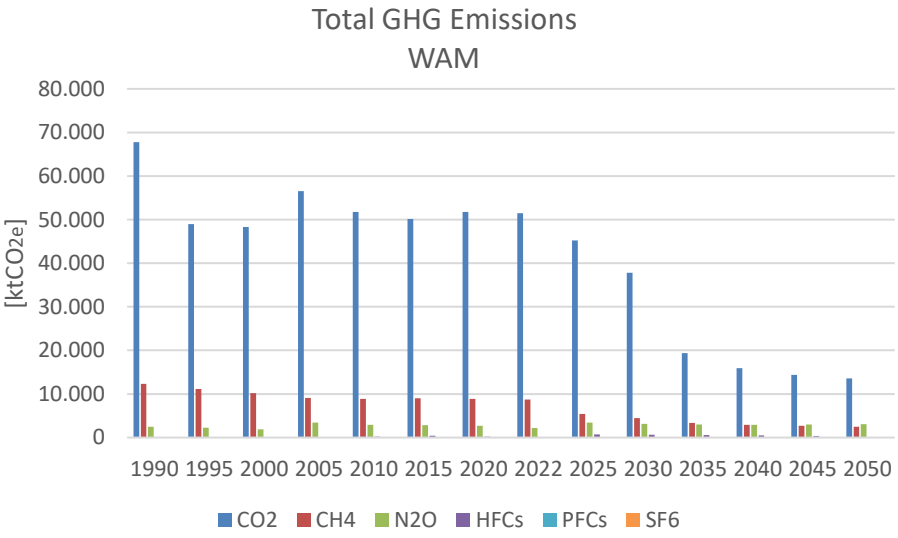


Figure 38 Evolution of GHG emissions by gases according to WAM scenario

Similarly, as for the WEM scenario in the WAM scenario representation of non-CO_2 gasses is due to structural changes significantly higher than in the WOM scenario. In the WAM scenario in 2050 CO_2 represents 70%, N_2O 16% and CH_4 13% and F-gasses less than 1% in the overall GHG emissions.
In general, it can be observed that according to all scenarios, carbon dioxide remains the largest part of total emissions from 2030 to 2050, but there will be three times less of it in 2050 according to the WEM scenario and more than 4 times less in the total amount of emissions according to WAM, when compared to WOM. According to the WOM scenario CO_2 will account for more than 99% of total GHG emissions in the energy industry and 94% in the Energy sector.
By 2030 Methane emissions, followed by N_2O emissions, represent the second largest emissions. Since the emission reduction options for the N_2O emissions from Agriculture sector are limited by 2050 the N_2O is outpacing CH_4 by share and become the second most important GHG in Serbia.

3.9.9 Projections of key indicators to determine progress towards NDC

Serbia's **NDC** sets a **specific target for GHG emissions reduction** by 2030. Since the energy sector is one of the largest contributors to GHG emissions in Serbia with power industry primarily due to coal-fired power plants Serbia is therefore using the following key indicators which are interrelated and collectively contribute to achieving this target. The three key indicators are:

- **Total GHG Emissions (without LULUCF) in CO_2e,**
- **Share of Renewable Energy Sources (RES) in Electricity Generation, and**
- **Share of RES in Gross Final Energy Consumption**

These indicators are critical for measuring Serbia's progress toward achieving its climate goals, as they provide comprehensive insights into emission reductions, the energy transition, and the broader integration of renewable energy. The rationale for selection on why these specific indicators were selected is as follows:

Core key Indicator for Emission Reduction Targets: The total GHG emissions (excluding LULUCF) in CO_2 equivalent (CO_2e) is the most direct and comprehensive measure of Serbia's contribution to global warming. It encompasses emissions from all key sectors (energy, industry, agriculture, and waste), which makes it the primary metric for tracking Serbia's ability to meet its overall emission reduction commitments under the Paris Agreement and NDC. Therefore projections of this indicator is crucial to evaluate the progress at intermediate milestones

Decarbonization of the Power Sector: The Power sector is by far most significant GHG emissions source in Serbia. By tracking the share of RES in electricity generation, Projections of this key indicator allows Serbia to measure progress on annual basis in decarbonizing one of the most critical contributors to its overall emissions. The shift from fossil fuel-based energy production (particularly coal) to renewable sources like wind, solar, and hydropower will lead to significant reductions in emissions.

Economy-Wide Transition to Renewable Energy: While the share of RES in electricity generation focuses solely on the power sector, this indicator offers a broader perspective by tracking the adoption of renewable energy across all sectors—including electricity, heating, cooling, and transport. Projections of this indicator ensures that the energy transition is happening throughout the entire economy, particularly in more challenging sectors like transport and heating, which are harder to decarbonize. Preparing projections and tracking this indicator guarantees that renewable energy is not confined to just one area but is integrated into the entire energy system. Additionally, by using gross inland energy consumption as the denominator for this indicator, Serbia is able to track energy consumption and evaluate the impacts of its energy efficiency measures.

Projections of indicators namely share of RES in electricity generation and share of RES in gross final energy consumption have been prepared whitin the scope of the preparation of the Integrated National Energy and Climate Plan (INECP) of Serbia which was prepared and submitted to the secretariat of the Energy Community as part of Serbia's international obligations. Serbia's INECP outlines a comprehensive and ambitious plan to transition towards a low-carbon, sustainable energy system. The focus on decarbonization, renewable energy, energy efficiency, and energy security aligns with the low carbon development objectives and EU goals and reflects a strong commitment to climate action.

However, it has to be noted that the successful implementation of the plan will depend on overcoming investment challenges, managing the social impact of the coal phase-out, and ensuring that policy measures are effectively executed across all sectors.

3.10 Other Information

No other information applicable

4 Information related to climate change impacts and adaptation under Article 7 of the Paris Agreement

4.1 National circumstances, institutional arrangements, and legal frameworks

4.1.1 National circumstances

The Republic of Serbia is highly exposed to climate change[63]. Since 2020, Serbia has experienced several extreme climate and weather events that caused significant material damages and financial losses, as well as the loss of human lives. Between 2000 and 2020, the minimum estimated material damage amounted to €6.8 billion, with more than 70% of the damage caused by droughts and high temperatures. In addition to droughts, intensive precipitation, floods, flash floods, landslides and wildfires are also climate hazards whose intensity and frequency are increasing due to climate change, resulting in escalating damages and losses.

Economic projections indicate that the absence of systematic planning and implementation of climate change adaptation measures in Serbia would lead to even greater losses. The extent of these losses depends on the climate change pace and the effectiveness of global mitigation measures. If the goals of the Paris Agreement are achieved, it is estimated that Serbia's GDP would decrease by 4.5% (USD 58.124 billion) during the period 2020–2040 and by 9.3% (USD 766.317 billion) during the period 2020–2100. However, damages and losses would be significantly higher if the goals are not achieved, potentially reaching up to USD 2.002 trillion during the period 2020–2100[64].

Natural, social, and economic systems cannot adapt to climate change without specifically planned measures and implemented activities related to disaster risk reduction, food production, the conservation of natural ecosystems, appropriate infrastructure development and renewal, energy production, and public health protection, among other. The goal of such measures and activities is to reduce the vulnerability of people, the economy, infrastructure, and the environment to climate change while preserving natural resources.

The process of planning and implementing climate change adaptation measures in the Republic of Serbia is regulated by the Law on Climate Change. This law prescribes the development and adoption of the Climate Change Adaptation Programme for the period 2023-2030 (Adaptation Programme), which includes an Action Plan for the period 2024–2026. The Adaptation Programme is submitted to the UNFCCC as National Adaptation Plan of the Republic of Serbia in 2024. The preparation of the Adaptation Programme adhered to the principles of the European Union's Climate Change Adaptation Strategy, ensuring that the adaptation process is "smarter", "swifter" and "more systemic". This approach is based on existing scientific knowledge, enabling the implementation of science-based solutions and their incorporation into sectoral policy documents, laws, and regulations from the national to the local level. Climate change analyses have been conducted to plan adaptation measures and to assess the impacts of climate change on sectors identified as priorities: agriculture, forestry, road infrastructure, energy, urban planning, public health and safety, and biodiversity. Key impacts were identified for each analyzed sector, while risk and vulnerability assessments were conducted at

63 https://unfccc.int/sites/default/files/NDC/2022-08/NDC%20Final_Serbia%20english.pdf
64 https://www.klimatskepromene.rs/wp-content/uploads/2020/04/cir_screen-_06-04-2020_DRAFT_-Study-on-the-Socio-economic-Aspects-of-Climate-Change-on-the-Republic-of-Serbia_UNDP.pdf

the national level in sectors where relevant data were available. Based on these assessments, sector-specific adaptation measures were recommended for the analyzed sectors, along with measures contributing to multiple sectors and general measures. A mechanism for timely and transparent monitoring and evaluation (M&E) of the adaptation process will enable systematic data collection, tracking the implementation of measures, and their evaluation. The M&E will start in 2025.

4.1.2 Institutional arrangements and governance on adaptation

The **Ministry of Environmental Protection of the Republic of Serbia** is the institution responsible for climate change adaptation at the national level. Its responsibilities include preparing the Climate Change Adaptation Programme, coordinating and monitoring the progress of its implementation, as well as reporting under the UNFCCC, the Paris Agreement, and to the European Union.

Institutions responsible for monitoring the implementation of planned adaptation measures include: the **Ministry of Agriculture, Forestry, and Water Management**, the **Ministry of Health**, the **Ministry of Construction, Transport, and Infrastructure**, and the **Ministry of Mining and Energy**. The **Ministry of Internal Affairs** is responsible for disaster risk management and emergency situations, while the **Ministry of Public Investments** coordinates projects for improving and restoring public facilities after natural disasters. The **Ministry of Science, Technological Development, and Innovation** and the **Science Fund of the Republic Serbia** provide support and funding for scientific research. The **Ministry of Finance** allocates budgetary financial resources for the implementation of adaptation measures, and the **Republic Secretariat for Public Policies** offers professional support in creating public policy documents.

The **Republic Hydrometeorological Service** is a specialized organization within the public administration system of the Republic of Serbia. Among other responsibilities, it performs meteorological and hydrological measurements and observations; monitoring, analysis and forecasting of weather, water, and climate; and provides early warnings and forecasts for meteorological and hydrological hazards. As the national hydrometeorological service, it fulfils Serbia's obligations to the **World Meteorological Organization (WMO)** and serves as the focal point for the **Intergovernmental Panel on Climate Change (IPCC)**.

The **Environmental Protection Agency** is an administrative body under the Ministry of Environmental Protection. It is responsible for monitoring environmental indicators, including those related to climate change adaptation.

Local self-government units and Autonomous Provinces are responsible for preparing and implementing planning documents, as well as reporting on the objectives of the Adaptation Programme considered during the preparation of these documents.

The **National Council on Climate Change** is an advisory body to the Government. It consists of representatives from government institutions, other authorities and organizations, the scientific and professional community, and civil society. Its role is significant in determining and implementing activities in the field of climate change.

4.1.3 Legal framework and public policy documents

The **Law on Climate Change** of the Republic of Serbia, adopted in 2021, serves as the primary legal document for planning and implementing policies and activities related to climate change. The objectives of this law include, among other, adapting to altered climate conditions through the adoption and implementation of public policy documents, as well as establishing mechanisms for

timely and transparent monitoring and reporting on climate change, its impacts, and the implementation of planned adaptation measures. The law mandates the adoption of a **Climate Change Adaptation Programme** with an **Action Plan**. This program is intended to identify climate change impacts on various sectors and systems and propose priority adaptation measures in sectors where reducing negative impacts is necessary.

The **Climate Change Adaptation Programme for the period 2023–2030** with the **Action Plan for 2024–2026**, was adopted in December 2023. Its primary goal is to increase the capacity to achieve greater climate change resilience to ensure population well-being and the economy and the environment improvements. This is achieved through: 1) Raising awareness and knowledge about the climate change impacts and consequences, 2) Systematic implementation of adaptation process from the national to the local level, 3) Increasing the resilience of critical infrastructure and natural resources, 4) Strengthening financial support for the implementation of the adaptation process. The Adaptation Programme includes analyses of climate changes, their impacts, and vulnerability and risk assessments in sectors identified as the most vulnerable. It proposes 25 priority adaptation measures. The reporting process for implemented measures will be regulated by a bylaw (currently in a draft from). This bylaw will define the format and content of the reports, as well as the authorities and organizations responsible for reporting on climate change-related hazards, their consequences, and the implementation of adaptation measures, and the development and implementation of planning and public policy documents in sectors most affected by climate change. Reports will be submitted annually to the Ministry of Environmental Protection starting in 2025.

The **Law on Meteorological and Hydrological Activities**[65] regulates, among other, meteorological and hydrological measurements and observations within the national network of stations; the development and maintenance of climatological databases; the operational system of early warning and alerts of extreme weather, climate, and hydrological events, hazards and disasters; the analysis and mapping of disaster risks; the monitoring and research of climate change and its impacts on various sectors; the development and application of climate models; the creation of regional and local climate change projections; and the provision of climate services to assess vulnerabilities and implement adaptation measures.

The **Law on Disaster Risk Reduction and Emergency Management**[66] governs the field of disaster risk management and emergency situations, including monitoring climate change and adapting communities to expected consequences.

The **Law on Reconstruction After Natural and Other Disasters**[67] regulates the processes of recovery and reconstruction following natural and other disasters, as well as damage remediation and assistance to affected citizens and businesses. This law incorporates the principle of "building back better", which emphasizes increasing the resilience of buildings, infrastructure, and society to natural and other disasters throughout the recovery process.

4.2. Effects, risks and vulnerabilities, as appropriate

[65] https://pravno-informacioni-sistem.rs/eli/rep/sgrs/skupstina/zakon/2010/88/9/reg
[66] https://pravno-informacioni-sistem.rs/eli/rep/sgrs/skupstina/zakon/2018/87/1/reg
[67] https://pravno-informacioni-sistem.rs/eli/rep/sgrs/skupstina/zakon/2015/112/15/reg

4.2.1 Risk analysis of climate change effects

4.2.1.1 Climate trends and climate change scenarios

The analysis of climate change, its impacts, and adaptation options in the territory of Serbia is regularly updated within the framework of the National Communications submitted to the United Nations Framework Convention on Climate Change (UNFCCC). As an illustration of current changes and trends, Figure 39 shows the changes in average annual temperatures and precipitation for the entire territory of Serbia during the period 1951–2022.

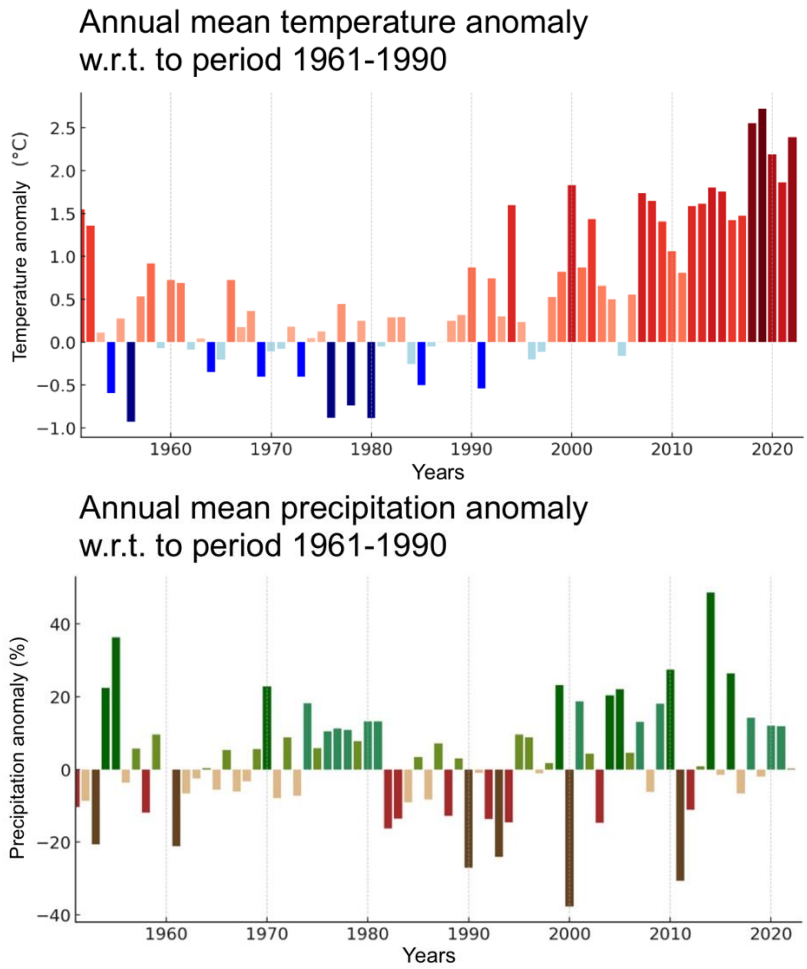


Figure 39. Annual average temperature and precipitation anomalies in Serbia for the period 1951–2022.

As part of the Adaptation Programme, an analysis of observed and future climate change and trends in climate hazards was conducted. The observation period used in these analyses is **1961–2020**, with **1961–1990** serving as the reference period for monitoring climate change. Future climate projections were conducted for the following periods: the **near future (2021–2040)**, **mid-century (2041–2060)**, and the **end of the century (2081–2100)**, also compared to the reference period **1961–1990**. These analyses were performed at the national level, based on the **RCP4.5** and **RCP8.5** scenarios.

Using the methodology of the Intergovernmental Panel on Climate Change (IPCC), changes in climate hazards were analyzed within the following categories: Excess heat, Excess water/moisture, Water/moisture deficit, and Storms. The identified climate hazards include: rising temperatures, increased frequency and intensity of heatwaves (including extreme high-temperature events), shifts in precipitation maximum within annual cycle and increases in intensive precipitation events (as a result

of changes in the inter-annual distribution of precipitation and changes in precipitation intensity distribution), increased frequency and intensity of droughts and aridity level (due to changes in precipitation patterns and rising temperatures), changes in storm-related hazards (including intensive precipitation and hail occurrence), as well as the contribution of increased climate variability to the aforementioned hazards categories. In addition to these climatic impact-drivers, within the **climate-land-water nexus** used for climate change analyses, the following climate hazards were identified: impacts on watercourses (increased risks of rising maximum flows, reduced minimum flows, and prolonged low-flow periods), slower groundwater recharge, increased risks of soil and landcover degradation, and increased wildfire risks.

This integrated approach to climate change analysis through an examination of shifts within the climate system, provides a more comprehensive understanding of hazards relevant to sectoral vulnerability assessments. **Table 29** summarizes the most significant information on climate change and climate hazards in the Republic of Serbia up to the mid-21st century. The table presents most likely climate trends by mid-century, considering both scenarios. Additional insights into trends of changes and analysis results by the end of the 21st century under the RCP4.5 and RCP8.5 scenarios is available in the Adaptation Programme (**Table 1 and Appendix 1**).

For the assessment of future climate changes, an ensemble of eight selected climate models from the **EURO-CORDEX project** was used. These models were validated and adopted as representative for monitoring climate change in the territory of Serbia. These analyses were also included in Serbia's **Third National Communication** submitted under the UNFCCC. Detailed explanations of the methodology and the data used can be found in the Adaptation Programme (**Appendix 1**). The climate data used in these analyses are publicly available through the **Digital Climate Atlas of Serbia** portal (atlas-klime.eko.gov.rs).

Table 29. Analysis of changes in climate hazards for the periods of recent past (2001–2020, with detailed results for the second decade 2011–2020) and mid-century (2041–2060). Quantified changes are presented relative to the values for the period 1961–1990, unless otherwise noted.

Climate Hazard Group	**2001–2020 (2011–2020)**	**2041–2060**
Excess heat	Average temperature: +1.4°C (+1.8°C) Average summer (JJA) temperature: +2.0°C (+2.4°C) Average maximum summer temperature (JJA): +2.2°C (+2.6°C) Heatwaves per year: +2.4 (+3) Hot days (above 35°C): +4 to +7 in lowland areas (+10 in specific regions)	Average temperature: +3.1°C Heatwaves per year: +4 to +5 Hot days (above 35°C): >+20 in lowland areas; occurrence in higher mountainous regions
	Record-braking high temperatures and historically warm seasons and years Reduction in snow cover duration Decrease in the frequency of cold waves, frost days, ice days, and days with extreme low temperatures	
Excess water/ moisture	Shift in the average annual precipitation maximum to earlier months (changes in inter-annual precipitation distribution), to colder period and the snowmelt season	Extreme precipitation events continue to increase

	Increased share of precipitation occurring as extreme precipitation (>30 mm/day) by over 100%. The share of light and moderate precipitation decreased (shifting distribution of precipitation intensity towards higher-intensity) Approximately 7% of Serbia's territory is at high risk (risk occurring every year) from extreme precipitation events	High risk of extreme precipitation affects 56% of Serbia's territory
	In rivers south of the Sava and Danube, flows increase during periods of higher discharge, maximum flow are rising. Increasing flood risks. There is no significant change in long-term average river flows Increased risk of land degradation due to intensive precipitation events	
Water/ moisture deficit	Reduced in average precipitation during summer (JJA) by 10%–20% (as a result of changes in annual precipitation distribution) On average, 4 years with drought per decade (5 per decade). In the referent period there was 1 year with drought per decade Extreme drought (defined by the significant damages of 2012 drought) occurred once in 2011–2020 The average value of aridity/humidity level for Serbia remains within humid climate category (no change compared to the reference period)	Average summer (JJA) precipitation reduction exceeds 20% Every year is on average on the territory of Serbia a year with drought Extreme drought frequency increases to 3–4 per year Increased level of aridity of climate conditions. On average dry sub-humid climate prevailing in Serbia
	Decline in river flows during low discharge periods. Prolonged low-flow periods. Decrease in values of the lowest flows. Slower rate of groundwater recharge. Increased risk of land degradation due to increasing aridity level Increased frequency of weather conditions conductive to the occurrence and spread of fires	
Storms	Increased intensity and frequency, including wind gusts intensity and hail Increase in average hailstone size	

4.2.1.2 Identification of risks towards climate change effects and vulnerabilities

For sectors identified as priorities in climate change adaptation, impacts and consequences have been analyzed, considering scientific reports prepared for the Adaptation Programme, as well as other expert and scientific literature. Levels of development of vulnerability and risk assessments, as well as capacities for further progress, have been identified. In Serbia's **Nationally Determined Contributions (NDCs)**, **water resources**, **agriculture**, **forestry**, including **biodiversity**, and **health** are recognised as sectors with determined climate change vulnerability. Additionally, **energy**, **infrastructure**, **transport**, and the **overall economy** of the Republic of Serbia are identified as sectors with observed increasing negative climate change impacts. The Adaptation Programme and its Action Plan have considered these sectors, along with the sector of **urban planning**. The current state of advancement of knowledge

on impacts, consequences, and vulnerability and risk assessments in these sectors is summarized in **Table 30**. An overview of the results from vulnerability and risk assessments within the sectors is provided in **Table 31**.

Table 30. Progress in climate change vulnerability and risk assessments by sector

Sector	Impacts	Vulnerability and Risk Assessment
Public Health and Safety	Most significant impacts identified.	Preliminary vulnerability assessment at the national level completed, including identification of vulnerable groups. Spatial assessment not been carried out.
Agriculture	Most significant impacts identified.	Vulnerability and risk assessments completed, including spatial distribution of risks by production types and 18 plant species.
Forestry	Most significant impacts identified.	Vulnerability and risk assessments conducted for predominant species, including spatial distribution of risks.
Road Infrastructure	Most significant impacts identified.	Vulnerability and risk assessments have not been carried out at the national level.
Energy	Most significant impacts identified.	Vulnerability and risk assessments are not planned, except for impacts on selected climate system parameters relevant to the energy sector.
Urban Planning	Most significant direct impacts identified, but without addressing urban system complexity.	Vulnerability and risk assessments have not been conducted or planned due to the complexity of urban areas. Efforts are focused on enabling risk identification at the local level.
Biodiversity	Impacts recognized from case studies.	Vulnerability and risk assessments have not been conducted. It has been recommended to integrate biodiversity impacts into the nexus with relevant sectors.

Table 31. Summary of information on impacts, vulnerabilities, and risks by sectors, with identified further steps needed for assessments where applicable. More details on these assessments can be found in the Adaptation Programme.

Sector	Results
Public Health and Safety	Between 45% and 55% of the population is at risk from climate change, with 20% to 30% under extremely high risk (certain to experience consequences). Due to urban migration, population aging, and rising extreme high temperatures, the share of the population under high risk is expected to significantly increase by mid-century. During the 2041–2060 period, temperature in urban hear island areas are expected to reach levels dangerous even for heathly individuals in 2-3 years per decade.

Agriculture	In **crop production**, maize production faces the highest risk at the national level. Maize occupies about 45% of arable land, predominantly in areas most exposed water shortages. Nearly 90% of this production is managed by family farms, which generally have low adaptive capacity. Yield reductions in the driest years, compared to the 2011-2020 average, reach up to 40%. Other vulnerable crops include soybeans, sunflower and sugar beet. Winter crops (predominantly wheat) exhibit greater resilience to climate change as they complete their development before the onset of the critical period of high temperatures and precipitation deficit. Although sugar beet cultivation is under high risk from climate hazards, yields are more stable due to producers' grater adaptive capacity (the largest share of soyabeans production is managed by legal entities, compared to other crops). Risks associated with unfavourable growing conditions are expected to increase in the future. Detailed risk assessments and their spatial distribution can be found in the Adaptation Programme (Appendix 2: Chapters 2.4 and 2.7). In **fruit production**, the greatest risks are currently associated with hail and frost during the growing season. Water shortages were previously identified as a concern for cultivated plants, leading to the recommendation to ensure irrigation. The highest risk of frost during the growing season is observed in apricot and almond production, followed by peach, currant, strawberry, and walnut in areas south of the Sava and Danube rivers. These species account for approximately 10% of the total area under fruit production. Plum, sour cherry, sweet cherry, raspberry, and blackberry are not highly vulnerable to frost during the growing season. However, this risk is expected to increase to high level in most parts of Serbia by mid-century. Apple, pear, quince, and blueberry are not significantly affected by risk of frost during the growing season, but they are under the high risk from high summer temperatures. These species comprise 18.4% of the total area under fruit production. Urgent action is needed to provide resources for installing hail protection and shading nets, as well as frost protection systems (identified as most critical for specific fruits). Risks from unfavourable growing conditions are expected to increase in the future. Detailed risk assessments and their spatial distribution can be found in the Adaptation Programme (Appendix 2: Chapters 2.1, 2.3 and 2.7). In **viticulture**, the impact of climate change has created optimal thermal conditions for grape growing and high-quality wines production, as well as expanded areas with favourable conditions for cultivation. The greatest risks are related to the potential future increase in frost occurrence during the growing season although current vulnerability is low. The highest current risk comes from hail. It has been identified as necessary and urgent to introduce the practice of installing anti-hail nets in viticulture, which is still not adopted as a standard practice in Serbian vineyards. Detailed risk assessments and their spatial distribution can be found in the Adaptation Programme (Appendix 2: Chapters 2.2 and 2.3). In livestock farming, the greatest increasing risk is the exposure of animals to high temperatures, highlighting the need to improve animal housing

	conditions. High levels of risks are also associated with the degradation of meadows and pastures due to insufficient rainfall. Detailed risk assessments and their spatial distribution can be found in the Adaptation Programme (Appendix 2: Chapters 2.5 and 2.6). Generally, adopting new practices in **agricultural sector** is necessary to increase resilience to climate change and mitigate negative impacts on soil, water and air.
Forestry	More than half of the areas reforested between 2019 and 2022, whose afforestation was founded through subsidies by the Forestry Directorate, have withered due to unfavourable weather conditions (water/moisture deficit and high temperatures). Under the climate conditions projected for the mid-century, the area with favourable general climate conditions for forest species such as fir, beech, spruce, white pine, and black pine is expected to decrease by approximately 30%. By the end of the century, under the scenario that assumes continued greenhouse gasses emissions growth (RCP8.5), the reduction in areas with favourable climate conditions could exceed 70%, and possible even 90%. English oak and other hygrophilous tree species will be threatened due to decreasing groundwater availability. It is urgently needed to amend regulatory frameworks concerning the establishment of new forests and the maintenance of existing ones, i.e. the forest management. Detailed risk assessments and their spatial distribution can be found in the Adaptation Programme (Appendix 3).
Road Infrastructure	Critical infrastructure, including road infrastructure, suffers the greatest damage from floods and flash floods, while the impacts of high temperatures and droughts are also increasing. The impacts and scale of material damage from individual cases are well-documented, but it is not possible to estimate the total value of the damages. In some years, the damages exceeded 5% of local self-government budgets, leading to the declaration of state of emergency. It is necessary to assess vulnerability and risks from all climate hazards and to ensure timely alerts to reduce damages on infrastructure, plan maintenance and construction works, and improve safety.
Energy	The availability and consumption of energy are most affected by rising temperatures and an increase in extreme heatwaves, as well as the impact of climate change on water resources essential for energy production and cooling systems. Since the parameters influencing energy production and consumption are significantly altered by climate change and will continue to change in the future, it is crucial to conduct impact analyses, have access to information on emerging risks, and optimize energy consumption.
Urban Planning	Air temperatures in urban heat islands can be 5–10°C higher than those recorder at measurement sites established according to WMO standards (which are created to minimize local influences, including the urban heat island effect, thus are performed in larger open space with grass cover and in the shade). Due to rising temperatures, it is estimated that within urban heat islands summer air temperatures in lowland cities in Serbia may reach levels dangerous to the health of all citizens, not just

	vulnerable groups (as noted under Public Health and Safety). Increasing the areas covered by natural greenery (low and tall vegetation) is the only effective solution for mitigating the urban heat island effect, which significantly heightens health risks for urban populations.
Biodiversity	Within the indicators reported under the Convention on Biological Diversity (CBD), shifts in vegetation phenophases, expansion of bird distribution ranges and increased defoliation in forests have been identified. However, due to the lack of indicators for systematic monitoring of climate change impacts on Serbia's diverse biodiversity, it is still not possible to determine the full extent of disturbances caused by climate change.

4.2.2 Effects and problems associated with climate change

The increasing frequency and intensity of climate hazards due to climate change affect vulnerable sectors through the identified growing risks. Impact assessments need to be improved, among other, through systematic monitoring of damages and losses, and by integrating disaster risk reduction policies, as defined by the **Sendai Framework**, with climate change policies established under the **Paris Agreement** and other regional documents.

Due to the increasing vulnerabilities caused by climate change, there is also a need to develop mechanisms for monitoring more complex phenomena and enhancing capacities for timely issuance of early warnings and alerts. One of the more complex issues is the increasing vulnerability to droughts, resulting from the combined effects of changes in precipitation distribution (inter-annual and intensity distributions), trend of increasing average temperatures, more frequent and intense heatwaves, and the diverse sensitivities of exposed systems.

The Republic of Serbia does not have a systematically organized monitoring system for droughts as a multidimensional, multisectoral issue. Consequently, there is no comprehensive system for issuing early warnings and alerts or declaring an emergency situation due to droughts when necessary. Other combined effects resulting from increased climate variability also cause problems for sector operations, such as sudden shifts between hot and cooler weather conditions, or drought conditions and excessive precipitation accompanied by flash floods.

It is necessary to incorporate the climate change perspective in the **Methodology for Risk Assessments and Rescue Plans** to enhance preparedness for climate change. This integration would address the lack of climate change considerations in planning documents, from the national to the local level.

4.3 Priorities and challenges in relation to adaptation

4.3.1 National priorities

In the case of the Republic of Serbia, priority climate change adaptation measures ensure that the adaptation process is sustainable. These measures are defined in accordance with the principles of the **EU Adaptation Strategy**, which stipulates that climate change adaptation should be: **smart** (based on scientifically grounded information and improving communication between scientists, policymakers, and decision-makers), **systemic** (adaptation is implemented through sectoral policy documents, laws, and regulations, as well as local-level planning), and **swift** (prioritizing actions and directing finances towards urgent interventions to mitigate the most significant and unavoidable negative impacts).

In the Adaptation Programme, recommendations on implementation priorities for each sector are outlined for the period 2023–2030, while the most urgent measures are presented in the Action Plan for 2024–2026. The measures are grouped according to the specific objectives of the Adaptation Programme, which are aligned with national priorities for creating a sustainable climate change adaptation process. In addition to national priorities, the general objective of the proposed adaptation measures is specified as: raising the knowledge of the citizens of the Republic of Serbia on dangers posed by climate change, as a foundation for building a more resilient society.

National priorities are listed in Table 32, while detailed measures are presented in Table 33, and indicators for monitoring are shown in Table 34.

Table 32. National priorities (NP) in climate change adaptation, defined as specific objectives of the Adaptation Programme, with key indicators for their monitoring and a general goal defined through the effect of raising public awareness in Serbia.

National Priorities	**Monitoring Indicators**
NP1. Raising awareness and improving knowledge and understanding about the climate change impacts and consequences	Monitoring the extent of climate data usage, development of methodologies to improve vulnerability and risk assessments, creation of educational materials, etc.
NP2. Establishing and strengthening capacities for the systemic implementation of the climate change adaptation process at the national and local levels	Percentage of adopted public policy documents in the sectors covered by the Adaptation Programme that have included climate change adaptation measures.
NP3. Increasing climate change resilience of critical infrastructure and natural resources	Number of national projects that have considered climate change and increasing risks from climate hazards in their planning, construction, and maintenance.
NP4. Strengthening financial support for the implementation of the climate change adaptation process	Number of program activities with financial incentives aimed at strengthening climate change resilience.
General Objective: Increasing the capacity to achieve greater climate change resilience to ensure population well-being, economy and the environment improvements	Monitoring the change in the general awareness of citizens regarding increasing climate hazards, assessed through surveys of various population groups (place of residence, age, occupation, gender, etc.).

4.3.2 Challenges to adaptation

The main challenges in the process of climate change adaptation in the Republic of Serbia are:

- Implementing knowledge about vulnerabilities and risks associated with climate change, as well as knowledge of potential adaptation methods, into sectoral policies and aligning these policies through a **nexus approach** to adaptation planning.
- Redirecting budgetary funds to meet the needs for reducing damage and losses caused by climate change and increasing resilience.
- Securing financial resources from international funds for the implementation of necessary climate change adaptation measures.
- The lack of technical capacities within institutions to provide access to essential information on vulnerabilities and risks, tools for assessments and planning in the field of adaptation, and dissemination of new knowledge and best practices.
- Insufficient availability of data across sectors for conducting vulnerability and risk assessments and adaptation planning.

4.4 Adaptation strategies, policies, plans and goals, and actions to integrate adaptation into national policies and strategies

4.4.1 Adaptation measures

Adaptation measures in the Republic of Serbia, defined in alignment with national priorities for climate change adaptation, are listed in Table 33 and grouped by relevant sectors. In addition to sector-specific measures, some of them represents measures of general significance, offering crosscutting multi-sectoral benefits**.** Out of the total measures, 36% are general measures**,** 24% are related to agriculture**,** 12% to forestry**,** 8% to energy**,** 8% to urban planning, and the remaining measures are evenly distributed across the sectors of road infrastructure, public health and safety, and biodiversity (4% each, i.e. one measure per sector).

These measures are detailly presented in Table 16 of the **Adaptation Programme**, which also provides additional information on their implementation, responsible institutions, partners, and stakeholders. For each measure, specific activities to be carried out through the Action Plan of the Adaptation Programme for the implementation period 2024–2026. Among the listed adaptation measures, the majority (52%) fall under National Priority 1 (NP1), followed by 20% under NP2**,** 12% under NP3**,** and 16% under NP4 (as outlined in Table 32).

Table 33. Climate change adaptation measures up to 2030, from the Adaptation Programme that are aligned with national priorities, including highlighted activities to be implemented by 2026, as regulated by the Action Plan (AP) of the Adaptation Programme.

Sector	Adaptation Measures
Public Health and Safety	• **Strengthening health sector capacities for monitoring the climate change impacts on human health**, through the development of a monitoring methodology, the implementation of a monitoring system, enhancing the skill of healthcare workers to monitor there impacts, as well as **improving the early health warning system for all climate hazards** by advancing predictive products and enhancing communication among relevant institutions responsible for assessing climate hazard levels and declaring health-related risks.

	○ AP1: Developing a methodology for climate change assessment and vulnerability monitoring for the health sector, and particularly for the vulnerable groups (children, people with disabilities, the elderly, outdoor workers), with proposed climate change adaptation measures.
Agriculture	• **Increasing the total amount of subsidies** for anti-hail nets, shading nets, and frost protection systems, as well as for the construction and adjustment of facilities for livestock housing to address increasing risks (from hail, frost, and high temperatures) and reduce the trend of rising damages. ○ AP2: Increasing the total amount of subsidies by 5% annually for anti-hail nets, shading nets, and frost protection systems. ○ AP3: Revising the Regulation on subsidies for investments in physical assets of agricultural holdings for the purchase of new machines and equipment for the improvement of primary plant production, to include special subsidies for investments in the acquisition of new machines and equipment intended for climate change adaptation. ○ AP4: Revising the Regulation on subsidies for investments in physical assets of agricultural holdings for the construction and equipping of facilities for the improvement of primary agricultural production in terms of the introducing new and grouping the existing investments related to the climate change adaptation of primary livestock production. • **Implementation of short-term adaptation (adjustment) in production** through the enhancement of agrometeorological services, strengthening the observational system, and regular training to enable timely responses tailored to specific types of production. ○ AP5: Feasibility assessment for use of meteorological data from stations owned by other institutions (Agricultural Advisory and Extension Service stations and other) and entry the stations in the RHMSS Stations Registry. ○ AP6: Increasing the number of meteorological and agrometeorological stations, stations for measuring soil moisture content, and hydrological stations for surface water and groundwater. ○ AP7: Developing new RHMSS products tailored to the needs of agriculture in monitoring and forecast of weather, soil and hydrological conditions, including expert consultations with scientists and end-users during the development. • **Organized and regular implementation of education** for advisory services to disseminate new knowledge aimed at adaptation, including the preservation of land and water resources, the implementation of Nature-based Solutions and the promotion of sustainable land management, through the development and regular revision of adaptation manuals for different types of production and the certification of advisers to carry out such trainings.

	○ AP8: Development of training manuals and certification for agricultural advisers, specifically for different types of production (fruit growing, viticulture, crop farming, and livestock farming). ○ AP9: Implementation of education programs for agricultural advisors on adaptation strategies. • **Implementation of the long-term adaptation** through the development and updating oz zoning for production areas by types of production (fruit growing and viticulture) and studies on the suitability for crop and livestock cultivation, considering increasing climate hazards, aimed at planning the species, varieties and hybrids selection, and production methods. ○ AP10: Developing methodologies for zoning in fruit growing and viticulture, incorporating information on accelerated changes in climate conditions and increasing risks from climate hazards. ○ AP11: Developing studies on the suitability of conditions for crop and livestock production, including spatial mapping of areas with different level of suitability due to the climate change impacts, including increasing risks from climate hazards. • **Strengthening capacity for sustainable irrigation** through the development of analyses of potential for establishing water accumulation and irrigation infrastructure, from macro to micro accumulations, with support in regional and local planning for sustainable water management for irrigation purposes, as well as the potential design and construction of infrastructure for the use of water from exiting artificial accumulations in central Serbia. ○ AP12: Developing a national-level study on the potential for the use of artificial accumulations (including micro-accumulations), possibilities for construction, and associated costs. ○ AP13: Developing a study on the analysis of the capacity for using water from exiting artificial accumulations in Central Serbia. • **Strengthening capacity for the protection of meadows and pastures** through the creation of risk maps at the national level, with recommendations for the implementation of adaptation within the framework of Nature-based Solutions. ○ AP14: Developing a study with mapped areas under increased climate change risks, with recommendations for increasing resilience.

Forestry	• **Revision of the regulatory framework for forest planning and management** aimed to increase climate change resilience.
	  ○ AP15: Adopting of the Regulation on the contents of the Forestry Management Master Plan, the manner and procedure for its adoption and preparation, material deficiencies or changed circumstances requiring its revision, the method of keeping records of performed works, and the contents and method of keeping forest chronicles in order to include information on climate change and its impacts.
	• **Development of manuals and trainings for forestry engineers** in the field of climate change and its impacts, and the inclusion of this area in the training for **licensing engineers**, as well as **strengthening capacity** through the analysis of afforestation success and early fire detection.
	  ○ AP16: Developing manuals for training forestry engineers on climate change impacts on forest condition and forest management and implementation of trainings for engineers.
	  ○ AP17: Preparing afforestation success analysis by species, type and age of seedlings and planting technology.
	• **Development of the methodology for the creation of different types of forests resilient to climate change and application in the development of an information system** to support the provision of information for sustainable forest management under climate change.
	  ○ AP18: Creating methodology for the development model for most important forest types over the next 50 years, and the development of models.

Road Infrastructure	• **Development of a methodology for assessing and conducting vulnerability and risk assessments** for the road infrastructure of the Republic of Serbia, with spatial risk mapping and **recommendations for changes to the standards** in road infrastructure construction. ○ AP19: Developing methodology for climate change vulnerability and risk assessment for road infrastructure, with the possibility of vulnerability and risk levels spatial distribution mapping.

Energy	• **Strengthening climate change resilience in energy supply** through the development of an **analysis of the impact of future climate change** on the annual distribution of heating and cooling degree days and **improving the early warning system by developing seasonal forecast products** to assess electricity demand for the upcoming season.
	  ○ AP20: Developing the impact assessment methodology for assessing the climate change impact on heating and cooling degree days distribution, and development of a study following the adopted methodology.
	  ○ AP21: Developing the methodology for implementing forecast products, from short-term to long-term, for estimating heating and cooling degree days.
	• **Strengthening climate change resilience in energy supply** through the development of an **analysis of the impact of future climate change** on

	the annual distribution of heating and cooling degree days and **improving the early warning system by developing seasonal forecast products** to assess the availability and temperature of water for cooling in the upcoming season. ○ AP22: Developing climate change impact assessment methodology on the climate change impacts on the availability and condition of water resources for cooling facilities, and development of a study following the adopted methodology.
Urban Planning	• **Financial support** from the state to local self-governments for co-financing to realisation of greening and afforestation projects using climate change resilient species, including projects aimed **at strengthening resilient green infrastructure in cities, and training employees in local self/government units**. ○ AP23: Announcing public competitions for the allocation of co-financing to local self-government units for the implementation of projects. ○ AP24: Strengthening capacities of local self-government units for implementation of climate change adaptation – implementation of accredited trainings for local self-government employees. • **Amendment of the regulatory framework** aimed at implementing the concept of green infrastructure to support the implementation of resilient green infrastructure in urban areas, based on a previously conducted study on the necessary interventions in laws and bylaws. ○ AP25: Conducting a study that will consider regulatory framework and public policy documents revision to ensure the implementation of the green infrastructure concept. ○ AP26: Improving climate change adaptation topic in the Urban Development Strategy of the Republic of Serbia. • Analysis of the method for **integrating climate change into the spatial and general urban planning of the Republic of Serbia**. ○ AP27: Improving the Methodology for local climate change adaptation plans preparation through a participatory process and intersectoral cooperation.
Biodiversity	• **Development of a methodology for determining indicators** for monitoring climate change impacts on biodiversity, to enable vulnerability assessment to climate change and future risk assessments, as well as the **implementation of measures for organizing the monitoring network and creating an integrated database** relevant for tracking the impacts of climate change on biodiversity, including the **implementation of adaptation in the Nature Protection Program**. ○ AP28: Developing methodology for status monitoring and vulnerability assessment of species, habitats and ecosystems, with proposed climate change adaptation measures. ○ AP29: Integrating climate change adaptation aspects in the Nature Protection Programme.

Multi-Sectoral	• **Monitoring the implementation of adaptation measures through sectoral policies and projects** – Developing guidelines for the implementation of green aspects in public policy documents related to adaptation contributions, including measures within the concept of Nature-based Solution, as well as conducting training for the application of the guidelines. o AP30: Development of guidelines for the implementation of green aspects in public policy documents related to adaptation contributions. • **Monitoring adaptation financing from the Republic of Serbia's budget** through tracking green expenditures in the national budget. o AP31: Development of a methodology for tracking green expenditures, with recognition of expenditures contribution to climate change adaptation. o AP32: Adoption of the developed methodology for tracking green expenditures contributing to adaptation. • **Establishing a system for monitoring climate change, its impacts, implementation and the effectiveness of adaptation measures** – system development and implementation. o AP33: Development and adoption of a bylaw regulating the annual reportin on the implementation of activities under the Adaptation Programme, as well as reporting on climate hazards and impacts. o AP34: Development of a methodology for assessing damages and losses caused by the climate change impacts. o AP35: Development of a portal with regular updates of georeferenced climate information. • **Development of research programs** – stablishing funding for scientific projects with a focus on climate change adaptation. o AP36: Analysis of the percentage of projects contributing to adaptation funded by the national Science Fund and determining priorities for directing scientific projects to strengthen knowledge in the field of adaptation. • **Improvement of the national methodology for disaster risk assessment** – Amendment of the national risk assessment methodology (Methodology for the development and content of disaster risk assessments and protection and rescue plans) to include information on climate change, specifically increasing climate hazards. o AP37: Amendments to the Methodology for the development and content of disaster risk assessments and protection and rescue plans to incorporate climate change. o AP38: Adoption of the improved updated Methodology for the development and content of disaster risk assessments and protection and rescue plans. • **Systematic address of drought as a multidimensional climate hazard** – development and implementation of methodology for monitoring, risk assessment, and early warning and alerts, covering all aspects of drought and its impacts on vulnerable sectors.

	○ AP39: Development of methodology for monitoring drought as a multidimensional climate hazard (with impacts across sectors and time scales). • **Financial support for improving early warning and forecasting systems, and dissemination of climate change information** – securing financial resources for the improvement of technical capacities of RHMSS (computing and observational systems). ○ AP40: Enhancement of RHMSS high-performance computer system. ○ AP41: Enhancement of RHMSS observation system. ○ AP42: Training of RHMSS staff on the use of new products from observation and forecasting systems for their implementation in the Republic of Serbia. • **Improvement of the early warning system and enhancement of information** availability within the activities of RHMSS, as well as **public education** to increase citizen readiness for growing climate hazards. ○ AP43: Improvement of forecast products (from short-term to long-term, including products designed for sectors such as health, agriculture, energy, etc. and testing of the enhances system). ○ AP44: Improvement of the RHMSS website to improve information accessibility and quality and to improve the timely information delivery to the location level. ○ AP45: Developing educational materials for children on the topic of climate change. ○ AP46: Conducting training for media representatives on climate change, hazards, impacts, risks and adaptation. ○ AP47: Monitoring public awareness of growing climate hazards due to climate change through regular national surveys. • **Adjustment of the regulatory framework in the field of land use to mitigate and prevent degradation** by regulating the use of degraded and abandoned areas for the implementation of sustainable land management and Nature-based Solutions. ○ AP48: Amending the Law on Compensation for the Use of Public Goods in a way that the fee for the change of land use of uncultivated land is abolished for reforestation with species more climate change resilient in both state and private forests.

4.4.2 Science, gender perspective, and traditional knowledge related to adaptation

Science

Currently, Serbia lacks scientific research programs specifically aimed at studying adaptation processes. The Adaptation Programme proposes the development of specialized research programs on adaptation to climate change, to be defined within existing scientific and research funding models,

such as the national Science Fund. Establishing a program to support adaptation research would ensure that the adaptation process remains "smart", i.e., based on scientific evidence and highly qualified knowledge about adapting to climate change.

Gender Perspective

The gender perspective is included in the Adaptation Programme through the analysis of climate change impacts on various vulnerable groups (older populations, impoverished populations, rural communities, outdoor workers, and particularly vulnerable groups such as children, pregnant women, people with disabilities, and those with chronic illnesses). Within impoverished populations, women represent a slightly higher percentage, including a larger share in single-person households and individuals over the age of 65. Conversely, a significant proportion of the population working outdoors consists of men, often in age groups with unfavorable demographic structures. Further research is needed to better understand the gender perspective, including spatial distribution assessments of vulnerabilities and risks, as outlined in the Adaptation Programme. This would facilitate planning supportive activities to enhance resilience to climate change while promoting equal opportunities in the context of gender equality. The steps necessary to incorporate the gender perspective into a sustainable adaptation process are outlined in the publication Gender and Climate Change in the Republic of Serbia[68].

4.4.3 Priorities

Table 33 outlines the adaptation measures that are considered as priorities (AP), representing the initial steps in implementing the national priorities listed in Table 32. These priorities also include measures for establishing monitoring systems for climate change, impacts, and adaptation implementation.

By the end of 2024, the adoption of a bylaw is planned to establish a framework for monitoring the outlined priorities as well as indicators for the monitoring and evaluation system.

4.4.4 Adaptation actions and/or economic diversification plans

The development of economic diversification plans related to climate change adaptation is anticipated in the future. This expectation is based on the Law on Climate Change, which requires that public policy documents in sectors most affected by climate change, as well as planning documents for autonomous provinces and local governments, must consider the objectives of the Adaptation Programme.

Some elements of economic diversification can already be recognized within broader initiatives addressing environmental challenges and promoting sustainable development. An example is the "EU for Green Agenda in Serbia" project, which aims to assist Serbia in implementing the Green Agenda for the Western Balkans. The project focuses on five pillars, the first of which includes Climate, Energy, and Mobility, promoting adaptation to climate change through: preparation and implementation of adaptation strategies to increase resilience, ensuring climate-resilient investments and reducing disaster risks, increasing the use of Nature-based Solutions for mitigation and adaptation.

[68] https://www.undp.org/serbia/publications/gender-and-climate-change-republic-serbia

In conclusion, Serbia's current climate change adaptation approach primarily relies on implementing specific adaptation measures through appropriate policies, plans, and strategies, while broader mechanisms, such as economic diversification, are yet to be fully incorporated.

4.4.5 Efforts to integrate climate change

Article 15 of the **Law on Climate Change** mandates that public policy and planning documents at the national, provincial, and local levels be developed considering the objectives of the Adaptation Programme. Reports on this integration will be available annually starting in 2025.

Through the planned implementation of AP37 (revisions to the methodology for disaster risk assessments and protection plans) and AP38 (adoption of the revised methodology), information on increasing climate risks will be integrated across national to local levels. Additionally, improvements to local-level adaptation planning methodologies (AP24) and the availability of climate data via the Digital Climate Atlas of Serbia (atlas-klime.eko.gov.rs) strengthen adaptation capacities.

Further measures include the development and adoption of methodologies and studies to systematically integrate climate change into sectors such as health (AP1), agriculture (AP10-14), forestry (AP18), road infrastructure (AP19), energy (AP20, AP22), and urban planning (AP25, AP27).

Other notable actions include: Developing training manuals for agricultural advisors (AP8, AP9) and forestry engineers (AP16); Amending regulations for forest management (AP15) and agricultural incentives (AP3, AP4); Enhancing urban development strategies (AP26) and biodiversity protection programs (AP29); Modifying the Law on Public Goods Fees to improve degraded land management (AP48).

Significant emphasis is placed on ensuring resilience across the population to reduce disaster risks and the impacts of growing climate hazards, such as: Improving early warning systems (AP40-42) and forecasting products (AP43, AP44); Enhancing agrometeorological services (AP7) and seasonal energy forecasts (AP21).

Progress includes the development of guidelines for integrating green aspects into public policy documents (AP30)[69] and the adoption of a methodology for identifying green projects in the national budget.

Additionally, the adoption of new environmental laws, such as the **Law on Strategic Environmental Impact Assessment** and the **Law on Environmental Impact Assessment**, is anticipated. These laws will consider the impacts of policy measures and projects on the environment, including climate change and growing climate hazards. The forthcoming **Environmental Strategy**, as the central document for implementing the Green Agenda for the Western Balkans, will integrate adaptation measures through decarbonization and sectoral activities.

Unadopted documents and regulations are not detailed in this report, as measures may change during the adoption process.

4.4.6 Nature-based Solutions (NbS) involvement to climate change adaptation

[69] https://rsjp.gov.rs/wp-content/uploads/Smernice-za-ukljucivanje-zelenih-aspekata-u-DJP-final-28.06.2024-1.pdf

Nature-based Solutions (NbS) are recognized in the Adaptation Programme as sustainable approaches to climate change adaptation with contributions to mitigation. Broader analyses of their implementation potential are provided in a study assessing the current state and opportunities for integrating NbS into strategic documents[70]. This study emphasizes the multi-sectoral contributions and integrated approach to achieving the objectives of the UNFCCC, UNCCD, and UNCBD.

Specific activities related to NbS implementation are planned under the Adaptation Programme for the 2024–2026 period. These include: Agriculture: Developing training manuals for agricultural advisors (AP8, AP9); Forestry: Forest management measures (AP15–AP18); Urban planning: Strengthening green infrastructure (AP23, AP25); Regulatory frameworks: Sustainable management of degraded lands and implementation of NbS (AP48).

The guidelines provided under AP30 ("Guidelines for integrating green aspects into public policy documents contributing to adaptation") also evaluate activities in the context of NbS.

To enhance the role of NbS in climate change adaptation, it is necessary to adopt a clear definition of NbS and a standard for their evaluation.

4.4.7 Stakeholder involvement

Stakeholders were actively involved in the climate change adaptation process through a consultative process for the preparation of the Adaptation Programme. This process included ministries, scientific and research institutions, local governments, public enterprises, and civil society organizations, identified based on their institutional mandates and climate-related activities. The Ministry of Environmental Protection coordinated the program's development, maintaining communication with relevant actors via meetings, workshops, and written correspondence. A detailed overview of the consultation process is provided in Chapter 10 of the Adaptation Programme for the period 2023–2030. Table 16 of the program lists partners and stakeholders alongside the responsible organizations for each measure.

Additionally, the program plans to involve the broader community in the adaptation process through: Journalist training; Educational materials for children and youth of various ages (AP45, AP46).

Starting in the 2023/2024 school year, the subject "Climate Change in Agriculture" was introduced in secondary agricultural and veterinary schools[71]. This subject familiarizes students with the basics of climate change, its connections to land degradation and water resource availability, and adaptation methods. Teacher training across Serbia has been conducted over the past year.

Over the last two years, several workshops have been held to familiarize stakeholders with the use of the Digital Climate Atlas. These workshops targeted employees in government institutions, local governments, researchers, and young scientists.

4.5 Progress on implementing of adaptation

[70] https://www.klimatskepromene.rs/wp-content/uploads/2021/10/NBS_CC_SERBIA_English.pdf
[71] https://pravno-informacioni-sistem.rs/SlGlasnikPortal/viewdoc?uuid=59d27971-3b29-4bed-a8ec-cb8fd667de0a&actid=1009565&doctype=og&abc=cba

The reporting on the implementation of adaptation measures aligned with national priorities, using indicators from the monitoring and evaluation system, is expected to begin in the first half of **2025**.

4.5.1 Progress on the Adaptation Strategy

In the Republic of Serbia, adaptation measures aligned with national priorities are currently defined only through the Adaptation Programme, which includes activities aimed at systemic implementation of adaptation. The first results on implementation progress will be available in 2025.

After the expiration of the Action Plan for the Adaptation Programme (2026), the preparation of the second Action Plan is anticipated for the subsequent period. This plan will include a review of the success of implemented measures and other information on climate change and adaptation implementation collected through the monitoring and evaluation system.

4.5.2 Information on the implementation of supported adaptation measures

Reporting on the implementation of adaptation measures prescribed by the **Adaptation Programme** will commence in **2025**. A bylaw, expected to be adopted by the end of **2024**, will establish a framework for tracking the implementation of adaptation measures annually. The regulation requires the collection and processing of data during the first quarter of each year.

4.5.3 Effectiveness of implemented adaptation measures

At this time, it is not possible to report on the effectiveness of implemented adaptation measures, as the first results from the monitoring and evaluation system are anticipated in the first half of 2025, as stipulated by the Law on Climate Change and the Adaptation Programme.

4.6 Monitoring and evaluation of adaptation actions and processes

4.6.1 Monitoring and Evaluation (M&E) approaches and systems

The **Monitoring and Evaluation (M&E) system** for adaptation consists of tracking indicators at the national level, categorized into the following groups:

- **Climate parameters**,
- **Impacts of climate hazards**,
- **Capacity building for climate change adaptation**,
- **Systemic implementation of adaptation**,
- **Financial investments contributing to adaptation**.

The formation and operation of the M&E system is structured through the following steps:

1. **Preparation of Scientific Reports**: Between 2020 and 2022, specialized reports were developed on climate change impacts, sectoral vulnerabilities and risks, and gaps, providing recommendations for next steps and monitoring indicators for vulnerable sectors outlined in the Adaptation Programme.

2. **Formation of a Working Group**: Led by the Ministry of Environmental Protection (Group for Climate Change Adaptation), this group includes government representatives and climate change experts. It evaluates proposed measures and defines priorities up to 2030, with specific activities outlined until 2026 and expected results identified.
3. **Development and Adoption of the Adaptation Programme**: Includes measures up to 2030 and the Action Plan for 2026, specifying activities for the M&E system's operation.
4. **Operationalization of the M&E System**: Includes preparation and adoption of a bylaw under the **Law on Climate Change**, expected soon.
5. **Annual Reports**: The first annual report on the implementation of adaptation measures is expected in Q1 2025.
6. **Evaluation of Implemented Measures**: Findings from the M&E system will inform the development of the next Action Plan for the Adaptation Programme.
7. **Revision of the M&E System**: Adjustments will be made based on results achieved by 2026.

4.6.2 Evaluation and indicators

The currently defined indicators within the M&E system are outlined in **Table 34**. Their tracking is organized under the Adaptation Programme activities and the planned reporting regulation. Selected indicators relate to data and actions provided and implemented by government institutions.

The indicators cover: Monitoring climate change, Impacts, Adaptation capacity, Investments and Systematic adaptation governance. At this stage, the M&E system does not include indicators that measure the effectiveness of adaptation interventions, as sectoral policies have not yet integrated measures derived from vulnerability and risk assessments. Consequently, contributions to resilience-building and reducing climate risks remain unacknowledged. In future revisions of the M&E system, indicators to monitor the success of interventions for resilience enhancement may be incorporated.

Table 34: M&E Indicators by Defined Groups, with Explanations for Their Validity and Monitoring Framework

Indicator Group	Indicators	Explanation
Climate Parameters	Anomalies in average temperatures relative to the reference period Number of heatwaves (defined according to the reference period) Number of days with temperatures above 35°C Anomalies in precipitation amounts compared to the reference period Frequency of extreme precipitation Occurrence of droughts Extreme river discharge Extreme groundwater levels Occurrence of hail	Reporting on the state of climate parameters is done annually, at the national level. Indicators are defined, and their monitoring is regulated through the Regulation on Reporting. The selection of climate indicators is alaigned with the identified most significant changes in the values of climate factors influencing the Adaptation Programme.

Impacts of Climate Hazards	Damaged infrastructure due to climate hazards Decline in agricultural crop yields Defoliation of broadleaf and coniferous forests Deviations in broadleaf and conifer species compared to the 2011–2015 reference state Number of recorded cases of vector-borne diseases in the human population and deviation compared to the 2011–2015 reference period Number of heatwave warnings issued and their duration in the health sector	The report on the impacts on climate hazards is produced on a national level once a year. Indicators are defined, and their monitoring is regulated through the Regulation on Reporting. Impact indicators are selected in accordance with the current state of available information, exiting sectoral monitoring systems, and identified impacts of climate change.
Capacity Building for Climate Change Adaptation on the National Level	Use of climate data from the national Digital Climate Atlas Developed national manuals for training and studies in the field of adaptation Number of national methodologies for vulnerability and risks assessments Percentage of the population aware of the issue of climate change Percentage of the population aware of the issue of increasing climate hazards	The monitoring of indicators is conducted at the national level, on an annual basis. These indicators are defined within the framework of the monitoring indicators for the implementation of the Adaptation Programme. The inidicators track progress in the areas of vulnerability and risk assessments, as well as climate change education for practical implementation, regulated through state activities. National manuals and methodologies refer exclusively to those developed in accordance with the Adaptation Programme, led by relevant state institution, but with the potential participiatation of all stakeholders. In this way, activities aligner with identified risks, other methodologies, studies, and assessments in the field of climate change are considered. Progress is also expected in rising awerness among the population of the Republic of Serbia about climate change and climate hazards, which is fundamental to imporving the general public's readiness for climate change, alongside the development

		of early warning system. For this reason, the M&E system includes an indicator for tracking public awareness.
Systemic Implementation of Climate Change Adaptation	Percentage (or number) of public policy documents adopted in the period 2024–2026 with included adaptation measures in sectors: public health, agriculture, forestry, road infrastructure, energy, urban planning, biodiversity. Local self-government planning documents with included adaptation measures Number of capital projects (planning, construction, maintenance) that have considered climate change	The indicators are defined within the framowrk of indicators for monitoring the implementation of the Adaptation Programme. They track progress in the systematic implementation of adaptation through sectoral policies and planning documents (from national to local level), as well as through capital projects that implement climate-resilient construction and maintenance.
Financial Investments with Benefits in Adaptation	Number of program activities of the Republic of Serbia that ensure or encourage adaptation investments	The indicator is defined within the framework of indicators for monitoring the implementation of the Adaptation Programme. As part of the implementation of the Program's measures, a methodology will be developed for monitoring state investments in projects contributing to adaptation. The application of this methodology will enable the monitoring of financial investments in adaptation in the Republic of Serbia, as well as the potential trend of their increase in the future.
Other Indicators	In addition to the listed indicators, the Adaptation Programme also monitor other indicators that reflect changes in regulations, the development of early warning and alert systems, education of professional staff and employees in relevant ministeries and other state bodies, training of journalists, as well as education of children and youth, vulnerability and risk assessments, etc. Their results are also included in the M&E process.	

4.6.3 Relevant information on the management of adaptation measures

Relevant information on managing adaptation measures to climate change is presented in previous chapters, detailing the priorities and plans defined in the Adaptation Programme.

4.6.4 Effectiveness and sustainability of adaptation measures

Since the Adaptation Programme was adopted in December 2023, the first results from implementation and the Monitoring and Evaluation (M&E) system are expected in 2025. The program outlines several regulatory interventions to ensure the sustainability of adaptation implementation, including:

- Amendments to the regulatory framework for forest management;
- Incorporating climate change education into the licensing curriculum for forestry engineers and agricultural advisory service consultants;
- Updating the national methodology for disaster risk assessments;
- Integrating climate change into Serbia's spatial and general urban plans;
- Amending the regulatory framework for implementing green infrastructure to enhance urban resilience;
- Systematic inclusion of drought as a multidimensional and growing climate hazard;
- Enhancing early warning and alert systems;
- Adjusting land-use regulations to mitigate and prevent land degradation;
- Incorporating adaptation into the Nature Protection Program.

Additionally, the program introduces measures to mitigate increasing damage from hail, frost, and high temperatures in agriculture. These short-term issues, which cannot be quickly resolved through changes in crop structure or farming methods, rely on increased subsidies for hail nets, shading systems, and frost protection measures.

The implementation of Nature-based Solutions (NbS) is also supported through the Adaptation Programme. Sustainability is further bolstered by the nexus approach, which integrates risk assessments and adaptation planning through a multi-sectoral consultative process during the program’s development.

The program anticipates implementing adaptation measures through sectoral policies, tracked via the M&E system. These sectoral activities are expected to contribute to the sustainability of the adaptation process.

However, insufficient funding remains a barrier to adaptation implementation. For the 2024–2026 period, a total of 998 million RSD (approximately €8.5 million) is allocated for implementing the Adaptation Programme, with 89.3% funded by Serbia’s national budget and 10.7% from donor funds. Indirect investments by Serbia in adaptation will be monitored through the M&E system. Although international projects provide technical support through capacity-building programs, major investments to enhance institutional technical capacity for monitoring climate hazards, impacts, alerts, and resilience interventions have been absent. Programs to strengthen recovery capacity for inevitable disasters are also lacking. The Adaptation Programme outlines sector-specific recommendations and estimates to guide future priorities in project development. These serve as directives for addressing gaps in funding and capacity-building initiatives to enhance Serbia's climate resilience.

4.7 Information related to averting, minimizing, and addressing loss and damage associated with climate change

The Adaptation Programme, under measures of general importance, defines the establishment of a system for monitoring climate change, its impacts, the implementation, and the effectiveness of adaptation measures. This system also includes monitoring the impacts of climate change through an enhanced framework for tracking losses and damages.

A new methodology for monitoring losses and damages is currently under development. This methodology aims to contribute to achieving the objectives of the Adaptation Programme by providing a more systematic approach to tracking and addressing the adverse impacts of climate change.

4.8 Cooperation, good practices, experiences, and lessons learned

4.8.1 Efforts in sharing information, good practices, experiences, and lessons learned

As part of the project "Improving Medium- and Long-Term Planning for Adaptation to Climate Change in the Republic of Serbia," funded by the Green Climate Fund and implemented by the United Nations Development Program (UNDP), the Digital Climate Atlas of Serbia was developed. This online platform provides climatological data and indices, offering information on past climate conditions (observations) in Serbia, as well as projections from 8 climate models under two greenhouse gas emission scenarios. The data is publicly available at the national, local, and municipal levels, presented in various formats and visualizations, and can be downloaded for different user needs. Data from the Digital Climate Atlas is also accessible through the Disaster Risk Register[72].

In 2024, a citizen alert system via mobile telephony was established in Serbia, a collaboration between the Ministry of the Interior and the Ministry of Information and Telecommunications.

The United Nations Children's Fund (UNICEF) in 2023 published a "Parent's Guide to Coping with Extreme Heat"[73], aimed at raising awareness among parents about the vulnerability of babies and young children to high temperatures and the need for appropriate protection. A youth-friendly summary of the Adaptation Programme was also created by the Network of Organizations for Children in Serbia[74], along with educational video materials developed in 2024. These materials, in Serbian, target young people, highlighting the impacts of climate change on drinking water and health and encouraging action through habit changes and the rational use of water, particularly during extreme weather events[75]. These efforts align with the Adaptation Programme, which emphasizes education on climate-related risks, such as water quality and availability, food security, and increased disease risks.

UNICEF also developed online training and resources for health visitors in 2024 to address child health protection during extreme heatwaves. These resources enable health visitors to support families with young children in managing extreme temperatures' effects on child health. The initiative aligns with

[72] https://drr.geosrbija.rs
[73] https://www.unicef.org/serbia/roditeljski-vodic-kroz-jako-toplo-leto
[74] https://zadecu.org/sazetak-programa-prilagodjavanja-republike-srbije-na-izmenjene-klimatske-uslove-2023-2030/
[75] Naučite više o važnosti čiste vode i očuvanju životne sredine - YouTube Svetski dan voda 2024 (SM)

the Adaptation Programme's goals of improving prevention and health monitoring in response to climate change impacts.

In collaboration with the Ministry of Environmental Protection (MEP) and UNICEF, Serbia held its first public dialogue with youth in 2024 titled "Youth in the Climate Adaptation Process: Are We Ready to Truly Adapt?" This initiative marked a step toward engaging youth in climate policies and supporting climate action, aligning with the Paris Agreement's call to empower all members of society in climate activities.

The City of Belgrade, in 2023, adopted amendments to its Climate Change Adaptation Action Plan with a Vulnerability Assessment, demonstrating best practices for urban adaptation planning. Additionally, in 2024, Belgrade drafted its Green Infrastructure Strategy, aligned with the analyses and recommendations from the Adaptation Programme.

4.8.2 Strengthening scientific research and knowledge

An example of good practice in collaboration between the scientific community and knowledge transfer is the project "Strengthening Resilience of the Agricultural Sector to Natural Disasters," funded by the European Union and implemented by the Food and Agriculture Organization of the United Nations (FAO) in cooperation with the Ministry of Agriculture, Forestry and Water Management, the Ministry of Education, and other partners. This project conducted numerous activities to enhance capacities for understanding climate change, assessing its impacts on agriculture, and planning and implementing adaptation measures in the agricultural sector at various levels. A series of training sessions on climate change adaptation and disaster risk management in agriculture was organized for representatives of the Ministry of Agriculture, Forestry and Water Management, local self-governments, teachers of secondary agricultural schools, agricultural advisors, and producers. Over 1,300 participants attended these sessions. Nine demonstration centres were established in 14 municipalities on approximately 150 demonstration plots, with the aim of practical learning and showcasing agro-technical adaptation measures, such as: reduced tillage methods, cultivation of leguminous and grass-legume mixtures in different conditions, subsurface irrigation systems, use of anti-frost systems in orchards, undermining, calcification, use of solar energy for irrigation etc. Over 850 participants, mostly agricultural producers, went through the training at the demo centres. The curriculum for secondary agricultural schools was reformed to include a new elective subject titled "Climate Change in Agriculture," offered to students in their second, third, and fourth years, as well as new teaching units on climate change adaptation in other subjects of these profiles. A handbook was developed for the new elective subject, and three training sessions were conducted for over 80 teachers from nearly 20 secondary agricultural schools. In the 2024/25 school year, students from seven secondary agricultural schools will have the opportunity to participate in this course.

In 2022, a public call for expressions of interest was announced to support the development of specialist and master's degree programs focused on climate change and adaptation[76]. The goal is to develop a multidisciplinary study program that will prepare professionals to address the challenges posed by climate change across all sectors of society. The implementation of this initiative is ongoing, with the first generation of students expected to enrol in these programs soon.

[76] https://adaptacije.klimatskepromene.rs/javni-poziv-za-prikupljanje-izjava-o-zainteresovanosti-za-podrsku-u-izradi-programa-specijalistickih-master-studija-u-oblasti-klimatskih-promena-ukljucujuci-prilagodjavanje-na-izmenjene-klimatske-usl/

Following the launch of the Digital Climate Atlas of Serbia, several training sessions were organized to teach participants how to use the platform. During these sessions, participants not only learned how to operate the platform, but also gained general knowledge about climate and climate change. Participants of the trainings included: employees from the government institutions, local self-governments and public enterprises, as well as young researchers, and employees of various civil society organizations, and non-governmental sector.

5 Information on financial, technology development and transfer and capacity-building support needed and received under Articles 9–11 of the Paris Agreement

The needs of the Republic of Serbia in the field of climate change have been determined based on the following documents:

- ✓ **Low Carbon Development Strategy of the Republic of Serbia for the period 2023-2030, with projections until 2050** adopted in year 2023
- ✓ **Climate Change Adaptation Programme for the period 2023-2030**, with the **Action plan for the period 2024-2026**.
- ✓ Integrated **National Energy and Climate Plan** (NECP) of the Republic of Serbia covering the period up to 2030 with a vision to 2050, adopted in year 2024

The selection of the most important measures and programmes requiring international assistance was carried out in cooperation between the Ministry of Environmental Protection and relevant ministries, including the Ministry of Mining and Energy, the Ministry of Agriculture, Forestry and Water Management, the Ministry of Construction, Transport and Infrastructure, the Sector for Emergency Situation of the Ministry of Interior, the Environmental Protection Agency, and the Republic Hydrometeorological Service.

Information on the financial support needed by the Republic of Serbia for the implementation of the Paris Agreement is presented in tabular form (Table III 6; Table III 8; Table III 10; Table III 12) as the annex to this Report.

The funds required for measures that will contribute to the goals of the Paris Agreement by sector are shown in the chart: *Needed funds by sector (billion USD)*

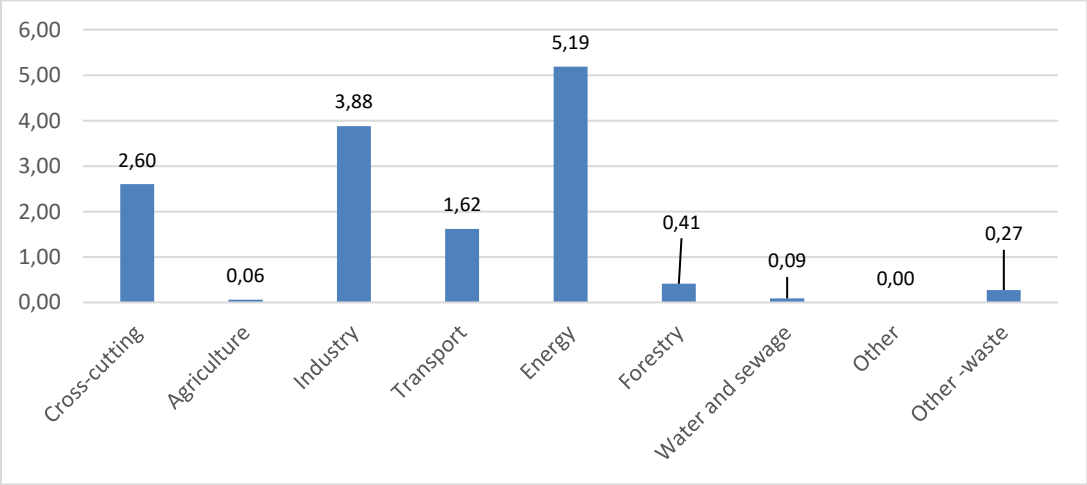


Figure 39: Needed funds by sector (billion USD)

The classification of sectors used to present the data follows the Guidance for the enhanced transparency framework referred to in Article 13 of the Paris Agreement (Decision 5/CMA.3). If a project, measure, or program covers multiple sectors, it is designated as cross-cutting. If a measure/need/program/project does not fall within any of the listed sectors, it is classified under the "other" category.

Infrastructure projects in the areas of water supply, waste management, and wastewater management are not included in the tables presenting the Republic of Serbia's needs for international assistance, nor in the tables related to received funds.

The ratio of needed funds for measures that contribute to adaptation, mitigation, and measures which contribute for both, adaptation and mitigation, marked as "cross-cutting" is presented in the following chart:

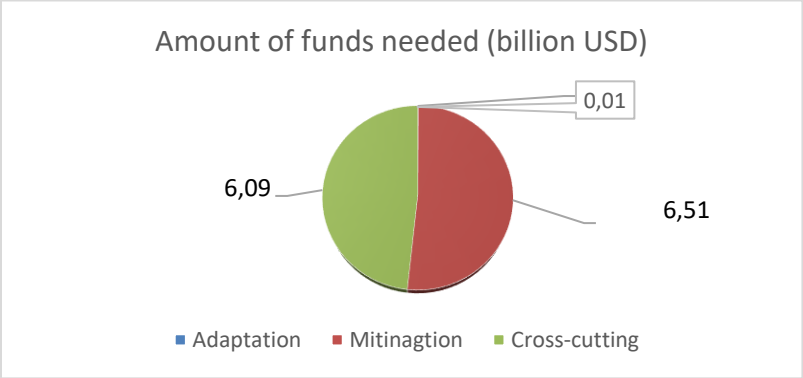


Figure 40: Amount of needed funds

International assistance is needed for the implementation of measures that promote technological development and technology transfer in the following sectors:

- industry (modernization of technological processes in industrial production),
- energy (improvement of the use of renewable energy sources and modernization of the energy sector),
- transport (promotion of the production and use of advanced biofuels, as well as the development of infrastructure for alternative fuels), and
- agriculture (improvement of technology and practices in the agricultural sector).

The financial needs for technological development and transfer in the industrial sector are significantly higher compared to other sectors, although investment estimation are lacking for certain measures within this sector.

By integrating scientific institutions as key partners in the implementation of measures that promote technological development and technology transfer, the Republic of Serbia will strengthen its capacities and technologies, thus contributing to the achievement of long-term climate goals in accordance with the Paris Agreement and the commitments defined in NDC.

In addition to involving the scientific and research community, the Republic of Serbia aims to increase the knowledge and skills of all groups involved in the fight against climate change.

Therefore, international support is needed for capacity building, including the improvement of medium- and long-term planning for climate change adaptation in the Republic of Serbia, the implementation of the Low-Carbon Development Strategy, as well as the implementation of the Adaptation Program, enhancement of the legal framework, establishment of incentive schemes and mechanisms in various areas, technical assistance for the preparation of various documents (analyses, studies), and other forms of support to improve the institutional framework and raise the knowledge and skills of all relevant actors in the Republic of Serbia.

An overview of the assistance received by the Republic of Serbia in the previous period has been made based on information collected from relevant ministries and data from the Second Biennial Updated Report (BUR2) and is presented in tabular format as an annex to this Report (Table III 7; Table III 9; Table III 11 and Table III 13).

Certain assumptions were used to present the data, which are defined in a separate section, clarifying the project implementation status ("planned," "ongoing," or "completed") as well as the status of financial assistance ("committed" or "received"). One of the most important assumptions related to projects in the implementation phase concerns how the amount of received funds is presented. Specifically, for the purposes of the Report, the total contracted amount of the project or the entire approved budget for that project is presented, rather than the currently disbursed financial funds. For regional projects, the amount of funds shown in the tables refers to the total project value, not exclusively to the funds allocated to the Republic of Serbia.

In the previous period, the Republic of Serbia has been supported by international institutions to strengthen its capacities in the field of climate change through numerous projects, with the most significant financial support directed towards measures related to "adaptation and mitigation", as shown in the chart.

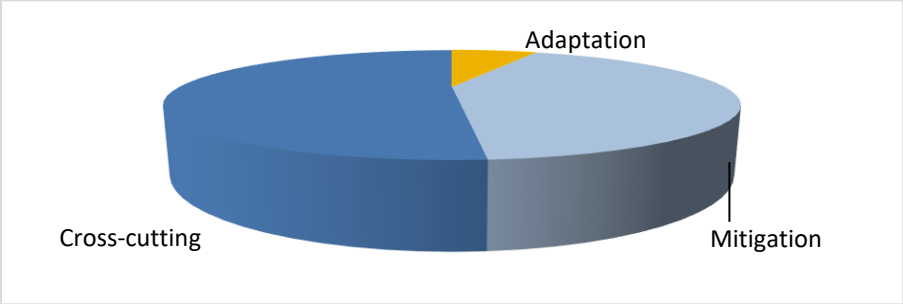


Figure 41: The amount of financial support for measures related to adaptation and mitigation

Out of a total of 31 identified capacity-building projects, 38.7% are completed, 51.6% are ongoing, and the remaining 9.7% are in the planning process. These data indicate significant progress in the implementation of projects that contribute to the fight against climate change, confirming the Republic of Serbia's commitment and solid capacities for resource management to implement planned initiatives.

Additionally, international institutions have supported several projects that include components regarding technology development and transfer of technology. Some of the funds have been invested in innovative projects, which were identified through public calls.

The Republic of Serbia is making efforts to prepare and periodically present national reports. The First and Second Biennial Updated Reports on Climate Change, the First and Second National Communications, as well as the update of the NDC, were prepared in the previous period with financial support from GEF and technical assistance from UNDP. In the coming period, international support is necessary to establish systemic solutions, clear procedures, and strengthen capacities for transparent and traceable reporting.

5.1 National Circumstances, Institutional Arrangements and Country-Driven Strategies

The areas of action for the Republic of Serbia have been defined in public policy documents. Accordingly, the documents that served as the basis for identifying and determining the needs of the Republic of Serbia in the field of climate change are:

- ✓ **Low Carbon Development Strategy of the Republic of Serbia for the period 2023-2030, with projections until 2050** adopted in year 2023. This document defines strategic directions and public policies for reducing greenhouse gas emissions across the entire economy. The investment costs for implementing the strategy are estimated at 7.3 billion USD for the period 2020-2030 and between 42.2 and 85.8 billion USD for the period 2030-2050. It is assumed that financial resources will be secured from various sources, including international financing.

- ✓ **Climate Change Adaptation Programme for the period 2023-2030**, adopted in 2023. The program involves implementing measures that will reduce vulnerability to climate change for people, infrastructure, the economy, and the environment, including the preservation of natural resources. It is estimated that 1,533,800 USD in donor funding will be required to implement the planned measures in the first three years. The estimate of the required funds for the implementation of the program after 2026 will be known after the preparation of studies and the implementation of other activities outlined in the Program.

- ✓ Integrated **National Energy and Climate Plan** (NECP) of the Republic of Serbia covering the period up to 2030 with a vision to 2050, adopted in 2024 year. The total investment needs for its implementation are estimated at approximately 34.12 billion USD. For some of the most important measures, the estimate of the required funds is still under consideration, as they are subject to the preparation of additional studies. Given the high investment needs, the role of international financial institutions will be crucial for the implementation of the measures outlined in this plan.

Considering that INECP has taken into account the Industrial Policy Strategy of the Republic of Serbia for the period 2021-2030 and the Water Management Strategy for the territory of the Republic of Serbia until 2034, as well as the measures from the Air Protection Program in the Republic of Serbia for the period 2022-2030 with the Action Plan and measures from the Low-Carbon Development Strategy, the presentation of the financial needs of the Republic of Serbia in the relevant sections of this document relies on estimates from INECP, in order to avoid duplication of the required financial resources for mitigation measures.

Furthermore, the implementation of adaptation measures in the sectors of agriculture, forestry, and water management may indirectly lead to a reduction in GHG emissions by reducing the use of fossil fuels or decreasing the supply of water and nutrients. Accordingly, certain measures from the Adaptation Program are presented in Table III.6, which is an annex to this Report, given their contribution to meeting the commitments of the Paris Agreement.

Due to the expiration of the periods they cover, the National Strategy for Agriculture and Rural Development of the Republic of Serbia for the period 2014-2024 and the four National Action Plans for Energy Efficiency for the periods 2010-2012, 2013-2015, 2016-2018, and 2019-2021 were not relevant for assessing needs for the upcoming period. It is expected that these documents will be revised for the coming period, including their goals, needs, and measures.

The Public Health Strategy of the Republic of Serbia for 2018-2026 recognizes the impacts and issues arising from climate change but does not define specific measures and activities directly related to climate change, and thus, it was not used as the basis for identifying needs.

Additional needs are expected to be identified in the document "Specific Implementation Plan for the EU Emissions Trading Directive (EU ETS)," which is currently under preparation. This document will identify technical measures, financial assessments, and an implementation plan for the measures and will be included in the next report (2BTR).

Also, the Environmental Protection Strategy – Green Agenda for the Republic of Serbia for the period 2024-2033 is in the public consultation phase. The draft Strategy includes measures that contribute to carbon neutrality and increased resilience to climate change in line with the Green Agenda, and these will be subject to the next report (2BTR).

To implement the planned measures and achieve strategic goals, international assistance is necessary for the institutions of the Republic of Serbia.

The Ministry of Environmental Protection (MEP) is responsible for the field of climate change at the national level. Also, MEP is the coordinator of climate change area and alignment with relevant EU legislation and national focal point of Serbia for the implementation of the UN Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, coordinating the development of strategic documents related to climate change and the integration of the climate change agenda into sectoral policies.

Additionally, other ministries and organizations, in accordance with their competences, participate in the implementation of measures and activities that contribute to achieving the goals in the field of climate change. The key institutions involved are the Ministry of Mining and Energy, the Ministry of Agriculture, Forestry, and Water Management, the Ministry of Construction, Transport, and Infrastructure, the Ministry of Public Investments, the Ministry of the Interior – Emergency Situations Sector, the Environmental Protection Agency, and the Republic Hydro meteorological Institute.

The Ministry of Finance will include the Methodology for Green Labeling of Projects in the Republic of Serbia's budget starting in 2025 in the Budget Preparation Guidelines. This will contribute to identifying budget items that support environmental protection and evaluating them against specific performance indicators. This process will allow better alignment of budgetary policies with environmental protection goals.

Additionally, the Republic of Serbia pays an annual contribution to international climate change conventions, including the Framework Convention, thereby supporting activities aimed at combating climate change.

Given the multi-sectoral nature of climate change issues, the **National Council for Climate Change** has been established in accordance with the Climate Change Law as an advisory body to the Government. It represents one of the most significant institutions for achieving societal consensus on climate change issues. The Council consists of representatives from ministries and other government institutions, as well as representatives from the scientific and professional public, civil society, and other stakeholders whose areas of work are important for determining and implementing activities in the field of climate change. It also includes a representative from the Office of the Commissioner for Protection of Equality of the Government of the Republic of Serbia.
The Law on Planning System defines the mechanism for monitoring the implementation of measures and activities and reporting on all public policy documents, including:

- The implementation of specific measures from the Low Carbon Development Strategy is monitored by the relevant institution, which reports to the Ministry of Environmental Protection.
- Additionally, the responsible authorities and organizations for implementing measures and activities from the Adaptation Program's Action Plan are required to submit a report on the implemented adaptation measures to the Ministry of Environmental Protection by March 15 each year. The Ministry of Environmental Protection prepares an annual report on the implementation of the action plan and submits it to the Government.
- The development of an integrated mechanism for monitoring policies and measures under the Integrated National Energy and Climate Plan (INECP) is underway. This mechanism will include procedures for continuous monitoring of both the achievement of individual INECP targets and the effectiveness and impact of each policy measure, including the use of relevant key performance indicators.

Furthermore, in accordance with the Planning System Law, the content of public policy documents and medium-term plans are entered into the Unified Information System for Planning, Monitoring, Implementation, Coordination of Public Policies, and Reporting. This information system was established to enable reporting and monitoring of progress. However, considering that the documents based on which needs were identified were adopted in 2023 and 2024, and that the relevant institutions were not required to report in the previous period, this mechanism could not be used for tracking the status of measures and activities.
Regardless of the monitoring and reporting system prescribed by the Law on Planning System, special departments in the relevant ministries are responsible for monitoring the implementation of European Union assistance. These departments coordinate activities related to projects funded by the EU IPA funds in cooperation with the Ministry for European Integration. Additionally, the Ministry for European Integration is obligated to submit an Annual Report to the European Commission on the implementation of financial assistance provided through IPA funds. Therefore, this mechanism applies exclusively to programs and projects financed by the EU IPA funds and covers all sectors, including the field of climate change. The Ministry for European Integration is currently enhancing its information system (ISDAKON), which is intended to include data on all donor assistance (EU IPA funds and other sources of financing), monitoring, and reporting. This highlights the need to strengthen the information monitoring system related to the support received, as well as the need to develop capacity for analyzing, interpreting, and managing data on the implementation and effects of measures on GHG emission levels, in accordance with the Climate Change Law. It is necessary to develop procedures and guidelines that will enable monitoring of the achievement of strategic goals and inter-institutional cooperation and communication.

5.2 Underlying assumptions, definitions and methodologies

This section of the Report was prepared in accordance with the Guidelines of the Framework Convention for the preparation of biennial transparency reports (Decision 18/CMA.1). Additionally, tabular formats approved by Decision 5/CMA.3 were used.
The required support has been identified in public policy documents, and the selection of the most important and relevant measures and programs was carried out in collaboration with the Ministry of Environmental

Protection and relevant ministries, in accordance with the Guidelines of the Framework Convention for the preparation of biennial transparency reports.
According to this methodology, information on financial support needed by the Republic of Serbia under Article 9 of the Paris Agreement are presented in tabular formats (Table III 6), on technology development and transfer support needed under Article 10 of the Paris Agreement (Table III 8), on capacity-building support needed under Article 11 of the Paris Agreement (Table III 10) as well as on support needed for the implementation of Article 13 of the Paris Agreement (Table III 12).
The review of the support received by the Republic of Serbia in the previous period was made based on information collected from relevant ministries and information from the Republic of Serbia's Second Biennial Update Report to the UN Framework Convention on Climate Change (2BUR).
This review of the received support is presented in a tabular format: Information on financial support received by the Republic of Serbia under Article 9 of the Paris Agreement (Table III 7), on technology development and transfer support received under Article 10 of the Paris Agreement (Table III 9), on capacity-building support received under Article 11 of the Paris Agreement (Table III 11) as well as on support received by developing country Parties for the implementation of Article 13 of the Paris Agreement (Table III 13).
In order to ensure the accuracy and comparability of data over time, the following assumptions, definitions, and methodologies were used for data presentation:

● **The conversion between the domestic currency and the United States dollars**

The exchange rate between the Serbian dinar (RSD) and the US dollar (USD) is 105 :1.
The exchange rate between the Serbian dinar (RSD) and the Euro (EUR) 120 :1.

● **Estimation of the amount of support needed**

The amount of required support is presented based on cost estimates for the implementation of relevant measures within public policy documents, which were adopted in the previous year (during 2023 and 2024).

● **The reporting period or year**

This report covers the period from 2023 to 2024. Given the significance of the received support, the report presents projects that have started or were in the implementation phase from 2019 to the present.

● **The amount of support funds coming from specific sources.**

For projects that are in the implementation phase, the total contracted amount of the project, or the entire approved budget for the project, is presented, rather than the currently disbursed financial resources, considering the dynamics of changes in such data.

● **Support status: Committed or received.**

The presented projects or programs have one of two statuses:

- If a contract or agreement for financial assistance has been signed for a specific project, but the implementation has not yet started, the status is " **committed** " support.
- If the implementation of the contract has started, the status is " **received** " support, regardless of whether the entire amount has been spent.

● **The status of an activity that has received support:**

The presented projects or programs have one of the following three statuses:

- If the contract has been signed but implementation has not started, the status is assigned as "Planned."
- If the implementation of the contract is ongoing, the status is assigned as "Ongoing."
- If the implementation of the contract has been completed, the status is assigned as "Completed."

● **The channel (bilateral, regional or multilateral) through which support was obtained**

The channels, or international organizations, through which the Republic of Serbia has obtained support for climate change have been identified, including both multilateral and bilateral sources.
Serbia has received assistance for climate change from the following sources:

- Funds within the UNFCCC framework: These include the Green Climate Fund (GCF) and the Global Environment Facility (GEF).
- EU funds and other donors.

For regional projects, the amount of funds shown in Table III.7 refers to the total value of the project, not exclusively the funds allocated to the Republic of Serbia.

● **Type of support (adaptation, mitigation, and adaptation and mitigation)**

According to the type of support, the presented projects or programs have one of the following three statuses:

- Climate change **adaptation** is the process through which societies, economies, and ecosystems develop and implement measures to reduce the negative impacts of climate change and take advantage of potential benefits it may bring. The goal is to increase resilience to climate impacts, such as extreme weather events, rising sea levels, droughts, and floods, while reducing risks to the environment, human health, economy, and infrastructure.
- Climate change **mitigation** refers to measures and activities aimed at reducing or preventing GHG emissions in order to slow down global warming and its negative effects. Unlike adaptation, which focuses on dealing with the consequences of climate change, mitigation addresses the causes of climate change, specifically by reducing emissions that contribute to global warming. If a measure contributes to both climate adaptation and mitigation, it is labeled as "Adaptation and Mitigation."

If a program/measure/project contributes to mitigation as a result of an adaptation action, it is labeled as "cross-cutting"

● Financial instruments (grant, concessional loan, non-concessional loan, equity, guarantees, insurance, or other).

For the presented projects or programs, the appropriate financial instruments have been defined:

- Grant - non-repayable funds
- Concessional loan - loan under favorable conditions
- Non-concessional loan - loan under market conditions
- Equity or ownership participation
- Guarantee - this type of financial instrument has not been used so far
- Insurance - this type of financial instrument has not been used so far

● Sectors and sub-sectors

The sector classification used is the one found in the table models provided in the Guidelines of the Framework Convention for the preparation of biennial transparency reports (Decision 5/CMA.3).

Sector
Energy
Transport
Industry
Agriculture
Forestry
Water and sanitation
Other

If a project, measure, or program covers multiple sectors, it is classified as "cross-cutting". If a measure/need/program/project does not belong to any of the listed sectors, it is categorized as "other."

It is estimated that the division between sectors is sufficiently clear and precise for the purposes of this Report, and that additional categorization by sub-sectors is not necessary. Therefore, categorization by sub-sectors has not been carried out.

● Information on the use, effects, and estimated results of the needed and received support.

Depending on the collected information, specific results are presented or the effect that the project is expected to achieve is described.

● Support by type of contribution: technology development and transfer or capacity building.

- **Technology development and transfer** in the context of climate change refers to the processes of creating, spreading, and applying new technologies that help mitigate climate change and adapt to

its effects. This includes the development of innovations that reduce greenhouse gas emissions, increase energy efficiency, and enable societies to better cope with the consequences of climate change, as well as the transfer of technologies between countries, particularly from developed to developing nations.

- **Capacity building** refers to the development and enhancement of skills, knowledge, institutional structures, and resources necessary for the effective implementation of climate policies and actions. It includes the preparation of legal frameworks and public policy documents, guides, manuals, analyses, and studies, as they also contribute to capacity building. For the purpose of this document, projects aimed at building infrastructure, including the preparation of documentation for construction, are not considered capacity-building projects.

It should be noted that certain measures simultaneously contribute to both technology development and transfer, as well as capacity building. Currently, there are no precise data on the funds required exclusively for each of these areas individually, and therefore, the estimated value should be taken with caution when it comes to distinguishing between these two types of contributions.

- **Clarification regarding infrastructure (investment) projects**

Infrastructure projects in the areas of waste management, water supply, and wastewater are not presented in the tables related to received funds or in the tables showing the needs of the Republic of Serbia.

5.3 Information on financial support needed

Since the 2BUR under the UNFCCC was prepared in 2023, and the Adaptation Program and INECP were recently adopted, these newly adopted documents provide updated and relevant data on needs for the upcoming period, with clear deadlines for their implementation. However, these documents do not define the prioritization of measures, nor do they establish criteria for prioritization within sectors or across all measures. Additionally, for certain measures, the investment amount has not yet been defined, as further analyses, studies, and research are required. Therefore, the financial amounts should be considered indicative.

Figure 42 shows the needed financial resources for measures that will contribute to the goals of the Paris Agreement, broken down by sectors. The division per sector is presented in line with the Guidelines for the preparation of Biennial Transparency Reports (Decision 18/CMA.1).

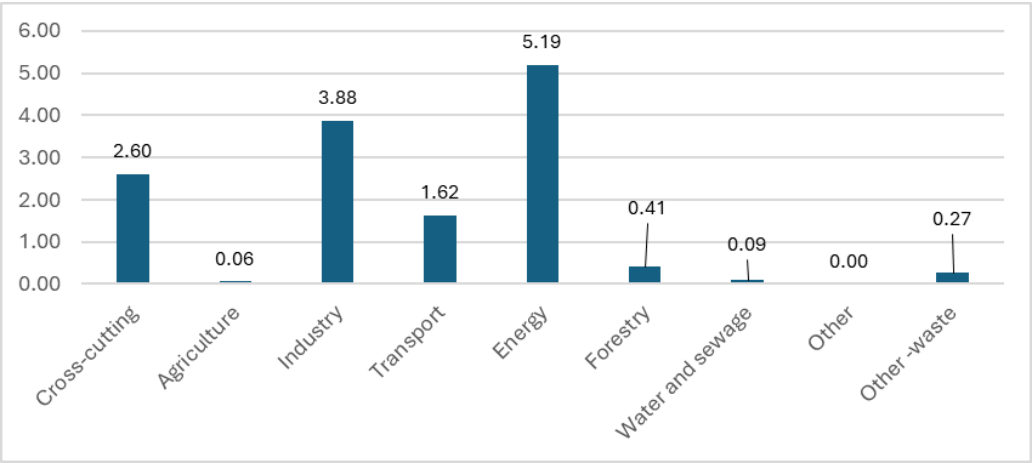


Figure 42: Needed funds by sector (billion USD)

Table III.6 presents the most important needs, whose implementation is planned with the support of the international community (EU and other donors, through grants and concessional loans), although financial options are not elaborated in detail.

In the Republic of Serbia, the Regulation on Capital Projects ("Official Gazette of RS", No. 79/2023) was adopted, which prescribes the identification and evaluation of capital projects. This enables the selection and

prioritization of infrastructure projects in the process of securing the necessary financial resources for the construction of infrastructure in the areas of water supply, wastewater management, and waste management.
A large number of activities for the construction of this infrastructure are already in the implementation phase. Therefore, the needs for the construction of infrastructure in the "water and sewage" sector, as well as in the waste management sector, are not presented in Table III.6.
The distribution of the required investments by sector is shown in Figure 43.

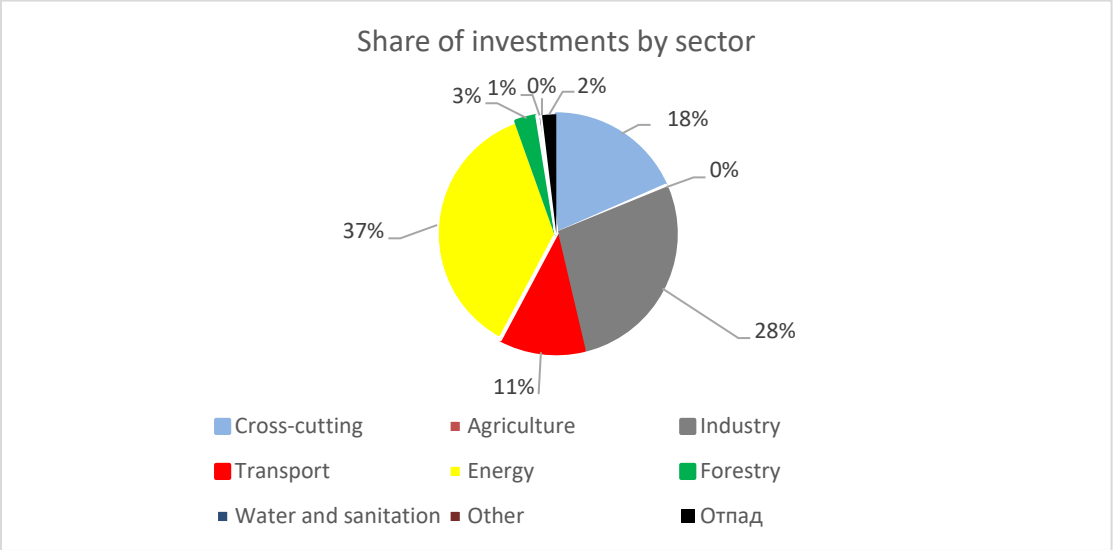


Figure 43: The distribution of needed investments by sector

The largest share of funds is needed for the energy sector (37%), followed by investments in industry (28%), while a significantly smaller amount is allocated for transport (11%).
Approximately 18% of investments are required for cross-cutting programs and measures, around 3% for forestry, while the amount needed for agriculture is negligible. For the health and biodiversity sectors, only one measure has been identified for each, with the estimated investment values included in the "other" category, which are also negligible.
For measures that contribute exclusively to adaptation, about USD 0.01 billion is required, while measures that contribute solely to mitigation are estimated at USD 6.51 billion.
However, certain measures provide dual benefits — actions that stem from adaptation often contribute to mitigation as well. These measures are categorized as "cross-cutting" with total investments for such measures amounting to USD 6.09 billion.
Figure 44 presents a comparison of measures contributing to adaptation, mitigation, and those with dual benefits categorized as "cross-cutting".

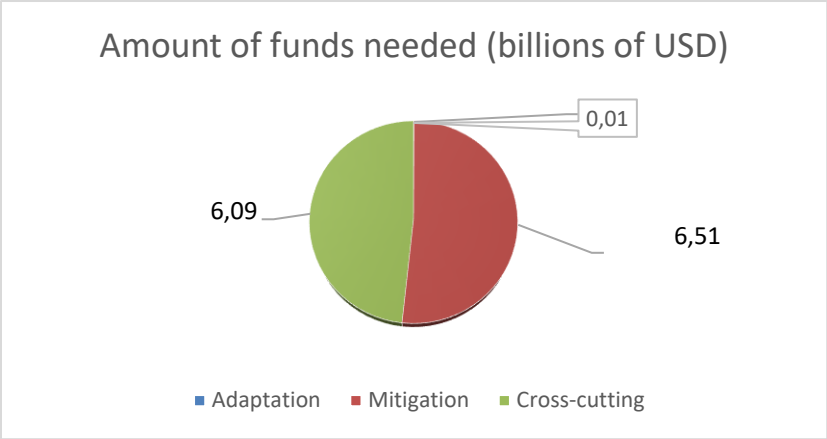


Figure 44: Amount of needed funds by type of measures

According to the currently identified needs and financial estimates for their implementation, the largest investments are required for measures that contribute to climate change mitigation, while investments in measures for adaptation to climate change are negligible compared to the other two categories of measures. However, due to their dual benefits, "cross-cutting" measures should be prioritized, as their overall effect will be significantly greater. Additionally, the financial needs estimates for adaptation in the Adaptation Program are provided only for the first three years of the program's implementation.

The identified needs (formulated as measures) are regulatory (reform), informational-educational, and investment-related (including infrastructure construction or equipment procurement).

Regulatory (reform) measures are aimed at improving the legislative framework and implementing policy reforms that will align national regulations with the objectives of the Paris Agreement. By strengthening the legal framework and aligning it with EU climate and energy standards, Serbia will enhance its ability to reduce greenhouse gas emissions and promote the transition to a low-carbon economy. These reforms will support the achievement of GHG emission reduction targets outlined in the NDC document.

Informational-educational measures are focused on raising public awareness and building capacity, which is crucial for developing environmental responsibility. These measures will empower stakeholders in national and local governments, industry, the economy, civil society, and local communities to actively contribute to climate actions. Through education and public awareness, Serbia will create a strong foundation for long-term behavioral changes that will support both climate change mitigation and adaptation measures.

In order for Serbia to reduce GHG emissions and contribute to global efforts to mitigate climate change, the transition to a low-carbon economy (decarbonization) becomes essential. Therefore, investment measures, i.e., investments in infrastructure development and equipment procurement, are recognized as the most significant and financially demanding actions that will directly contribute to reducing GHG emissions. These investments include transitioning to clean energy sources, increasing energy efficiency, developing sustainable transportation, and reducing the use of fossil fuels in industry and agriculture.

Additionally, decarbonization can stimulate the development of new technologies, create new jobs, and attract foreign investments, which would help Serbia not only achieve its climate goals but also strengthen its economic competitiveness. Successful decarbonization requires effective cooperation between different sectors, as well as international support in financing and technology transfer.

Cross-cutting measures, due to their complexity, require much more detailed coordination and cooperation between different institutions compared to sectoral measures. Although the responsible entities and partners for implementing activities are clearly defined in public policy documents, it is necessary to improve coordination mechanisms among institutions when defining priorities, communicating with donors, and during the implementation of measures and activities. Therefore, it is essential to establish clear criteria and procedures for defining priorities, as well as more detailed procedures for monitoring the implementation of measures.

Communication with donors should occur only after priorities have been agreed upon and the most optimal financial mechanisms for each measure, project, or program have been identified.

International support for the implementation of the measures presented in Table III.6 will play a key role in fulfilling the commitments Serbia has defined in its NDC, as well as in achieving the long-term goals of the Paris

Agreement. All the listed measures contribute to reducing the carbon footprint and advancing the goals Serbia has set through its NDC.

5.3.1 Information on technology development and transfer support needed

The Republic of Serbia requires support in implementing certain measures that promote technological development and technology transfer in the sectors of industry, energy, transportation, and agriculture.
Although there is a lack of investment estimates for some measures in the industrial sector (e.g., measures to reduce emissions of fluorinated greenhouse gases in refrigeration and air conditioning equipment), the financial needs for technology development and transfer in this sector are significantly higher than those in other areas. However, achieving the GHG emission reduction targets set in the NDC will require significant contributions from measures in other sectors as well.
Namely, the Republic of Serbia has defined plans for technology development and transfer through several inter-sectoral measures:

- Development of research programs in the field of adaptation to changing climate conditions: Prioritization of scientific topics contributing to climate change adaptation will help better understand the areas and topics to which scientific research should be directed. This measure involves innovations and new technologies for adaptation;
- Support for demonstration projects to promote biomethane and renewable hydrogen will contribute to demonstrating the efficiency and sustainability of these energy sources;
- Development of efficient supply chains for the exploitation of available biofuel, biogas, and biomass potential: Encouraging the exploitation of available resources promotes technological advancement in these areas;
- Financial support for the construction and energy renovation of buildings to exceed minimum energy requirements: Use of low-carbon building materials, contributing to innovations in the construction industry; Promoting smart and carbon-neutral cities involves the implementation of advanced measuring devices, which will represent technological development.

Additionally, the Republic of Serbia plans to develop and transfer technology in order to improve the use of renewable energy sources and modernize the **energy sector**.

- Support for electricity generation from renewable energy sources requires the transfer of advanced technologies and innovations to increase the efficiency and capacity of RES;
- Stimulation of energy production from renewable sources, including heating and cooling, requires the development of new technologies and the improvement of existing systems. International support can enable the introduction of the latest technologies into these sectors;
- There is a plan for the modernization of the coal industry and the introduction of new technologies to reduce harmful gas emissions and improve efficiency, ensuring resilience in case of energy supply restrictions or interruptions and flexibility in the national energy system;
- Investments in the digitalization of energy networks, the introduction of advanced metering devices, and the implementation of smart grids are essential for improving Serbia's energy infrastructure through the development and transfer of advanced technologies.

Serbia plans to **modernize industrial process technologies** and more effectively prevent the emission of pollutants into the air, water, and soil by applying Best Available Techniques (BAT) in accordance with the BREF documents. This development will enable more efficient emission prevention, including the reduction of GHG emissions.

International support will be crucial for access to the latest technologies and tools required for the modernization of the industrial sector. This includes the implementation of advanced technologies and materials that reduce the use and emissions of fluorinated gases, which are significant for global warming. Additionally, investments in new technologies and the optimization of existing industrial processes are necessary to reduce energy consumption and increase energy efficiency.
Serbia plans to **improve technologies and practices in the agriculture sector** to reduce GHG emissions:

- Reducing methane (CH4) emissions through changes in livestock feed composition and feeding practices,
- Reducing CH4 and nitrous oxide (N2O) emissions through improved manure management using anaerobic digestion, and
- Reducing N2O emissions from soil through innovative management practices.

The implementation of these plans requires close cooperation with research institutions, which will play a key role in implementing and testing new technologies in the agricultural sector. International support will be crucial for accessing the latest technologies, which should contribute to the more efficient implementation of sustainable agricultural practices. These investments will not only improve environmental standards in the sector but will also significantly accelerate the achievement of climate goals defined in the NDC and the Paris Agreement.

Serbia's plans in the **transport sector** include promoting the **production and use of advanced biofuels, as well as developing infrastructure for alternative fuels**. The planned measures aim to accelerate technological development in biofuel production for use in transportation, contributing to a reduction in GHG emissions, decreased dependence on fossil fuels, and the sustainability of the transport sector. International support will be crucial for access to state-of-the-art technologies and methods in biofuel production and distribution, as well as for developing the necessary infrastructure to expand the use of alternative fuels. These activities are essential for increasing the sustainability of the transport sector, reducing emissions, and decreasing dependence on fossil fuels, which will support Serbia's long-term climate goals.

Scientific institutions have been identified as key partners in the implementation of these measures. Through this partnership, along with access to the latest technologies and their adaptation to Serbia's specific needs, domestic capacities in research, development, and the application of innovations in the field of climate change will be significantly enhanced. This is crucial not only for strengthening domestic capacities but also for ensuring continuous progress in climate change mitigation and adaptation.

By integrating scientific and research institutions into this process, the Republic of Serbia will strengthen its capacities and technologies, thus contributing to the achievement of long-term climate goals in line with the Paris Agreement and the commitments under the NDC.

5.4 Information on technology development and transfer support received

The component related to the development and transfer of technology is identified in thirteen projects presented in Table III.7, with a total value of approximately 0.226 billion USD. One of these projects is financed by a concessionary loan amounting to 0.05 billion USD, while the total value of projects that combine loans and grants is 0.15 billion USD. The value of projects supported by the GEF fund amounts to 8,891,901 USD.

A portion of these funds has been invested in innovative projects identified through public calls. Through public calls in the form of challenges, Serbia has encouraged cooperation between business entities and research organizations, while simultaneously promoting the development and transfer of technology, within the framework of the following projects:

1. "Climate Smart Urban Development Challenge": Support has been provided for the identification of various ICT technological solutions and business ideas that can be applied at the level of local governments to increase the share of "climate-resilient" public services. Financial support was granted to 25 holders of innovative ideas (2 local self-governments, 2 public enterprises, 3 private companies, 7 research organizations, 5 civil society organizations, and 6 individuals), while further development of the ideas through a project incubator was ensured for 2 local self-governments, 3 private companies, 1 research organization, and 3 civil society organizations.
2. "Green Agenda for Serbia": A multi-year Challenge for innovative solutions for the green transition of the Serbian economy has been announced, aiming to support the implementation of innovative business solutions in all five areas of the Green Agenda for the Western Balkans, including the area of Decarbonization and Green Industry. To date, 14 project ideas for innovations for cleaner air have been selected (3 local self-governments, 2 public enterprises, 5 research organizations, 1 vocational school, 3 private companies), 29 project ideas for the decarbonization of the economy and reduction of environmental pollution (18 private companies, 10 public enterprises, and 1 local self-

government), 14 innovative project solutions under the call for Forests and Green Infrastructure to improve natural values and climate change resilience (6 local self-governments, 4 public enterprises, 2 private companies, and 2 civil society organizations), and 29 project ideas on the topic of Circular Economy.

3. "Just Green Transition and Decarbonisation in Serbia": Technologies and innovative business models have been identified and applied in sectors most affected by decarbonization. Specifically, the project co-financed 8 initiatives through a Public Call for Innovative Solutions, contributing to the achievement of Serbia's NDC targets for reducing GHG emissions with $600,000 (around 6% of the total investment value). These projects mobilized additional investments from the corporate sector, amounting to approximately $10 million. The implementation of these projects has resulted in a reduction of 12,563 t/CO2 emissions, with prospects for reaching a cumulative level of 230,147.82 t/CO2 over a 20-year period.
4. "Innovative and Just Green Transition as Tool for Securing Systemic Energy Security and Reducing Energy Poverty" Support has been provided for innovative solutions that reduce dependence on imports, diversify energy sources, lower the energy intensity of the economy, or enable access to clean and affordable energy for vulnerable populations. Through the Public Call for Innovative Solutions, the project co-financed 12 initiatives that contribute to achieving Serbia's NDC goals for reducing GHG emissions. The implementation of these projects has resulted in a reduction of 15,656 t/CO2 emissions, with an expected reduction of 313,125 t/CO2 over a 20-year period.

In the listed projects, the principle of selecting the best innovative ideas was applied, with mentorship and technical support provided for further development (acceleration phase). For the most successful among them, co-financing was secured to implement the ideas in practice.

This support mechanism significantly contributes to technological development, the improvement of existing technologies, and the development of new ones. At the same time, this approach creates opportunities to strengthen the capacities of research institutions, enabling them to develop and implement innovations in the field of climate change in the future.

Successfully implemented projects and sustainable technological solutions are actively promoted, encouraging the transfer of knowledge and expertise (know-how), which contributes to increasing the level of technical expertise and capacity within business entities, fostering innovation and sustainable development.

In addition to the projects that apply public calls in the form of challenges, through the project "Reducing the carbon footprint of local communities by applying the principles of the circular economy in the Republic of Serbia - Circular Communities" is planned to establish a Platform for Innovations in Low-Carbon Communities to identify and support new business ideas, products, and investments in the fields of circular economy and efficient resource utilization.

Additionally, biomass market development projects (Component 1 completed, Component 2 ongoing) contribute to the development and transfer of technologies for the use of biomass as an energy resource. The project "Rehabilitation of the District Heating System in Serbia – Phase V" contributes to the modernization and improvement of the efficiency of the district heating system.

Through energy efficiency projects in public buildings and central government buildings, the use of renewable energy sources and the improvement of energy efficiency have been actively promoted. These projects contribute to reducing energy consumption and heating costs, supported by the application of modern technologies that enable more efficient use of energy resources.

The "Clean Energy and Energy Efficiency for Citizens" project supports the application of technologies for clean energy production and increasing energy efficiency in households. This includes the use of solar panels and other renewable energy sources, as well as improving building insulation.

It can be concluded that the Republic of Serbia is in an early stage, advocating for fostering cooperation between businesses and research organizations to develop innovative solutions, while the application of research is still underdeveloped.

5.5 Information on capacity-building support needed

In addition to involving the research community, the Republic of Serbia strives to increase the level of knowledge and skills of all stakeholders involved in the fight against climate change. Education plays a central role in raising awareness, building capacity, and implementing measures to combat climate change. Special attention must be directed towards children and young people through the integration of climate topics into the educational system, the development of educational materials, and programs that will strengthen their understanding and empower them for climate-responsible action.

Therefore, many of the measures in Table III.6 are related to providing support for capacity building in various sectors and for different target groups.

Technical assistance is needed to **improve medium-term and long-term planning** for climate change adaptation in the Republic of Serbia, the **implementation of the Low-Carbon Development Strategy**, as well as the **implementation of the Adaptation Program**, which includes an Action Plan.

Special measures in the Action Plan of the Adaptation Program aimed at strengthening capacities include:

- Strengthening capacity and raising knowledge for adapting agricultural production to climate change.
- Strengthening capacity to achieve the resilience of forest ecosystems to changed climatic conditions.

A certain number of identified needs relate to **improving the legislative framework** (concerning green spaces, renewable energy sources, promoting electromobility, promoting renewable energy technologies through public procurement processes, and supporting/modernizing highly efficient cogeneration and district heating/cooling systems). Additionally, support is needed for the development of sustainable regional and municipal mobility plans, awareness-raising campaigns, and public information on climate change, as well as the development of various methodologies and studies in the areas of agriculture, health, and biodiversity.

The Republic of Serbia has recognized the importance of increasing the participation of both the public and private sectors in the implementation of its NDC. In this context, measures have been identified to establish **incentive schemes and mechanisms** in the following areas: agriculture, biofuel production and consumption in the transport sector, increasing the use of electric vehicles, expanding forested areas, producing electricity for self-consumption, developing renewable energy sources, promoting environmentally friendly bioenergy, as well as energy retrofitting of buildings and promoting energy efficiency in the industrial sector.

Special attention will be focused on financial and fiscal incentives, including tax exemptions and tax refunds for innovative and demonstration projects, provided that these projects can significantly contribute to increasing value added at the national level and meeting energy needs at the local level.

Technical support will be necessary for institutions in the Republic of Serbia to establish and implement these incentive mechanisms.

In addition to technical assistance for the development of various documents, including analyses, studies, and other forms of support to improve the institutional framework, which will result in strengthening the capacity of the institutions that are the beneficiaries of these documents, **support is also needed to enhance the knowledge and skills of various stakeholders** in Serbia.

Changes of employees' positions or staff turnover are common occurrences in national and local administration, which significantly complicates the capacity-building process. Therefore, continuous training and a mentoring approach for new employees are essential.

In addition, civil servants in the administration, as well as employees in public enterprises and other legal entities in the energy, industry, and transport sectors, are facing new obligations prescribed by the Climate Change Law. Furthermore, they are tasked with responsibilities that must be carried out to implement the measures outlined in public policy documents.

Therefore, it is necessary to conduct training and workshops for various stakeholders to acquire the necessary skills and knowledge to perform their duties. An example of this is training for establishing emissions trading systems, which is important for a large number of different stakeholders (government institutions, businesses, verifiers, as well as civil society).

To achieve the goals in the field of climate change, inter-sectoral cooperation is a significant challenge. As a result, it is essential to establish efficient coordination and collaboration among different institutions. Clear and detailed procedures need to be established, covering all aspects: from implementing legal obligations and identifying capacity-building needs, to communication during permit issuance and opinions, and procedures for preparing and reporting mechanisms.

It is particularly important to establish a common approach among institutions regarding priority needs, the sequence in which they should be implemented, and the division of responsibilities in this process. In line with

the identified needs and priorities for their implementation, it is necessary to develop appropriate programs and projects and strengthen the capacities for their preparation.
The basis for developing programs and projects that require financial resources is represented by the measures shown in Table III.6. These needs serve as a starting point for communication with potential donors and finding appropriate support programs (e.g., Green Climate Fund). In addition to establishing effective communication and coordination with donors and international organizations, it is necessary to strengthen the capacity for managing financial resources to ensure their proper use.
Although the Republic of Serbia is working on raising awareness about existing resources, initiatives, and available support, further enhancement of mechanisms for finding adequate support, monitoring and reporting on received support, developing clear communication channels, and involving all stakeholders in the process is crucial for the effectiveness and sustainability of strengthened capacities. It is particularly important to include the private sector due to the obligations they need to fulfill in order to contribute to emission reductions and meet the goals set in the NDC.
Additionally, continuous monitoring and reporting, based on evaluations and feedback from all stakeholders, will allow for the revision of activities to ensure that support is as effective as possible and tailored to real needs. An analysis of the received support relative to the identified needs will enable the assessment of the effectiveness of measures and programs, identify gaps, and reveal opportunities to improve existing approaches.
To ensure the sustainability of the capacity-building process, special attention needs to be directed toward previous experiences and the sharing of information about lessons learned.

5.6 Information on capacity-building support received

In the past period, the Republic of Serbia has been supported by international institutions to strengthen capacities in the area of climate change through numerous projects. Table III.7 presents the most significant projects that included capacity-building components (training and exchange of knowledge and experiences through seminars, workshops, study visits, preparation of various documents including strategic and planning documents, legal acts, guides, methodologies, etc.) between 2017 and 2024, with a total value of approximately 0.42 billion USD, of which the total value of projects supported by GEF or GCF amounts to 0.12 billion USD. This amount includes support received for the preparation of national reports to the UNFCCC, with a total value of 942,000.00 USD.

Out of a total of 31 identified capacity-building projects, 38.7% have been completed, 51.6% are ongoing, and the remaining 9.7% are in the planning process. These data indicate significant progress in the implementation of projects that contribute to the fight against climate change, which confirms the commitment of the Republic of Serbia and solid management capacities in carrying out planned initiatives.

An overview of the received support for capacity building by sector is presented in Table 29.

Table 28: Capacity building projects by sector

Sector	Number of projects/programs in the period 2017-2024	Amount of funds (billion USD)
Energy	9	0,210
Transport	1	0,002
Industry	1	0,003

Agriculture	1[77]	0,003
Forestry	4	0,100
Water and sanitation	0	0
Cross-cutting	14	0,081
Other	1	0,020

The comparison of the received support for capacity building for adaptation and mitigation is presented in Table 30.

Table 29: Capacity building projects by type of support

Type of support	Number of projects	Amount of funds (billion USD)
Adaptation	6	0,028
Mitigation	13	0,18
Cross-cutting	12	0,22

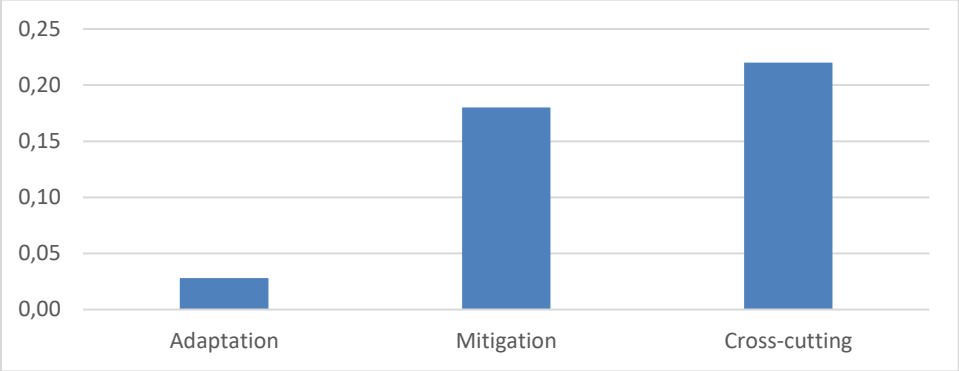


Figure 45: Financial intensity of support for capacity building by type of support

Through technical assistance projects, strategies and planning documents have been developed, and support has been provided for the development and improvement of the legal framework of the Republic of Serbia. As part of the project "Advancing medium and long-term adaptation planning in the Republic of Serbia" a sectoral analysis of the impact of climate change was conducted, along with the development of an Adaptation Program and a Digital Climate Atlas.

[77] The agriculture sector participated in cross-cutting projects. Projects financed through the IPARD program are not presented in Table III.7.

The project "Removing Barriers to Promote and Support the Energy Management System in Municipalities in Serbia (EMIS 1)" provided support for the development of the legal and institutional framework for energy efficiency.
Further support for improving the strategic and legal framework is planned through the EU-funded project "Technical Assistance for Improvement of Climate Change Policy Framework".
In addition, during the previous period, support was provided to strengthen the capacity of institutions to implement strategic, planning, and regulatory documents. Budgetary support to the Government of Serbia was secured by the French Development Agency in coordination with the World Bank, along with technical support to accelerate reforms in the field of climate change.
The following projects were significant for the establishment of the institutional framework, national procedures for financing from the Green Climate Fund, and highlighting the importance and benefits of private sector investments in the fight against climate change:

- "Developing the capacities of Serbia for an effective engagement with the Green Climate Fund (GCF)"
- "Strengthening Serbia's capacities for strategic engagement of private sector into climate financing"

So far, projects worth USD 2,795,841 have been implemented through the Green Climate Fund, and funds have been allocated for a new program titled "Enhancing the resilience of Serbian forests and the carbon storage potential of the country to support and boost the decarbonization process through adaptation and mitigation investments" amounting to USD 103,000,046.
A large number of projects included activities for training staff in relevant institutions, resulting in increased knowledge and skills in the field of climate change.
Projects such as "Climate Smart Urban Development Challenge" and "Partnership for Good Local Government" are primarily focused on strengthening capacities at the local level.
The Republic of Serbia also actively participates in the following regional projects:

- Enhancing Environmental Performance and Climate Proofing of Infrastructure Investments in the Western Balkan Region from an EU integration perspective (ClimaProof)
- „TRATOLOW" - Transition towards low emissions and climate-resilient economy in the Western Balkans and Türkiye)
- Regional Energy Efficiency Programme for the Western Balkans (REEP Plus)

Due to the lack of a legal framework and insufficient technical capacities, the software solutions developed through the project "Establishment of Transparency Framework for the Republic of Serbia (CBIT)," which aim to improve the process of monitoring and reporting on the implementation of climate change projects, are not yet operational.

5.7 Information on support needed and received by developing country Parties for the implementation of Article 13 of the Paris Agreement and transparency-related activities, including capacity-building in the area of transparency

In line with its international commitments, Serbia is making efforts to prepare and periodically submit national reports.
The first and second biennial updated climate change reports, as well as the first and second reports of the Republic of Serbia under the United Nations Framework Convention on Climate Change (UNFCCC), along with the updating of the NDC, were prepared in the previous period with financial support from GEF and technical assistance from UNDP.
The development of the first Biennial Transparency Report was supported within the project "Preparation of the First Biennial Transparency Report and Combined Fourth National Report and Second Biennial Transparency Report of Serbia under the UNFCCC," implemented by the Ministry of Environmental Protection. Through this project, the preparation of the next Biennial Transparency Report was also secured.

The preparation of these documents is coordinated by the Ministry of Environmental Protection. It has become a practice to form working groups consisting of representatives from all relevant ministries and organizations to facilitate data and information gathering. The preparation process involves organizing numerous consultations and roundtable discussions, with active participation from government institutions, public and private companies, NGOs, and research institutions, ensuring public inclusion and transparency.

The project "Establishment of Transparency Framework for the Republic of Serbia (CBIT)" supported Serbia in establishing a national transparency framework in line with the provisions of the Paris Agreement. Additionally, the continuation of the project is expected to provide further support in the future.

Serbia faces the challenge of establishing a system for continuous reporting on national communications, biennial transparency reports, and nationally determined contributions (NDCs). Systemic solutions and clear procedures are needed to enable more efficient reporting, as well as to strengthen capacities for generating and reporting with traceability and transparency.

The process of preparing the Biennial Transparency Report would not be possible without international financial and technical support, which contributes to improving national capacities. However, there remains a need for continued financing, capacity building, and awareness raising to ensure the achievement of the goals set in the NDC.

ANNEX A – Decision 5/CMA.3 Annex II Common tabular formats for the electronic reporting of the information necessary to track progress made in implementing and achieving nationally determined contributions under Article 4 of the Paris Agreement

CTF Table 1. Structured summary: Description of selected indicators

Indicator(s) selected to track progress[a]	*Description*
{Indicator}	Total GHG emissions (without LULUCF) in CO2eq
Information for the reference point(s), level(s), baseline(s), base year(s) or starting point(s), as appropriate[b]	Base year: 2010 During the revision of the first NDC, the calculation of the greenhouse gas inventory and quality assurance and quality control (QA/QC) processes identified the 2010 as the base year. In order to make comparisons with the first and the second NDC and changes in the greenhouse gases (hereinafter: GHG), the GHG emission is expressed compared to 1990. The reference level in the base year (2010) is 63 800 ktCO2eq considering NDC target is expressed also as eimssion reduction compared to 1990, the reference level in 1990 is 82 667 ktCO2eq
Updates in accordance with any recalculation of the GHG inventory, as appropriate[b]	NA (The reference level for the base year 2010 and year 1990 are consistent with the level reported in 3rd National Communication as submitted to the UNFCCC)
Relation to NDC[c]	The indicator is defined in the same metric, methodology, scope and unit as the target of the NDC.

Notes: (1) Pursuant to para. 79 of the MPGs, each Party shall report the information referred to in paras. 65–78 of the MPGs in a narrative and common tabular format, as applicable. (2) A Party may amend the reporting format (e.g. Excel file) to remove specific rows in this table if the information to be provided in those rows is not applicable to the Party's NDC under Article 4 of the Paris Agreement, in accordance with the MPGs. (3) The Party could add rows for each additional selected indicator and related information.

[a] Each Party shall identify the indicator(s) that it has selected to track progress of its NDC (para. 65 of the MPGs).

[b] Each Party shall provide the information for each selected indicator for the reference point(s), level(s), baseline(s), base year(s) or starting point(s), and shall update the information in accordance with any recalculation of the GHG inventory, as appropriate (para. 67 of the MPGs).

[c] Each Party shall describe for each indicator identified how it is related to its NDC (para. 76(a) of the MPGs).

CTF Table 2. Structured summary: Definitions needed to understand NDC

Definitions[a]	
Definition needed to understand each indicator:	
Indicator "Total GHG emissions in CO2eq"	Total GHG emissions correspond to the annual totals reported in CO2 equivalents excluding LULUCF in the latest national GHG inventory. The totals comprise all sectors and gases listed in the CTF table entitled 'Reporting format for the description of a Party's nationally determined contribution under Article 4 of the Paris Agreement, including updates'.
Any sector or category defined differently than in the national inventory report:	
{Sector}	Not applicable
{Category}	Not applicable
Definition needed to understand mitigation cobenefits of adaptation actions and/or economic diversification plans:	
{Mitigation co-benefit(s)}	Not applicable
Any other relevant definitions:	
{…}	Not applicable

Notes: (1) Pursuant to para. 79 of the MPGs, each Party shall report the information referred to in paras. 65–78 of the MPGs in a narrative and common tabular format, as applicable. (2) A Party may amend the reporting format (e.g. Excel file) to remove specific rows in this table if the information to be provided in those rows is not applicable to the Party's NDC under Article 4 of the Paris Agreement, in accordance with the MPGs. (3) The Party could add rows for each additional sector, category, mitigation co-benefits of adaptation actions and/or economic diversification plans, indicator and any other relevant definitions.

[a] Each Party shall provide any definitions needed to understand its NDC under Article 4, including those related to each indicator identified in para. 65 of the MPGs, those related to any sectors or categories defined differently than in the national inventory report, or the mitigation co-benefits of adaptation actions and/or economic diversification plans (para. 73 of the MPGs).

CTF Table 3. Structured summary: Methodologies and accounting approaches – consistency with Article 4, paragraphs 13 and 14, of the Paris Agreement and with decision 4/CMA.1

Reporting requirement	*Description or reference to the relevant section of the BTR*
For the first NDC under Article 4:[a]	
Accounting approach, including how it is consistent with Article 4, paragraphs 13–14, of the Paris Agreement (para. 71 of the MPGs)	**Accounting approach** The methodology/accounting approach/metrics/scope used for the indicators in Table 1 is the same as the methodology/accounting approach/metrics/scope used to assess the implementation and achievement the NDC target. **Consistency with Article 4 paragraph 13-14 :** Serbia's accounting approach is consistent with principles outlined in Article 4 paragraph 13 by following established IPCC Guidelines for National Greenhouse Gas Inventories. The approach promotes environmental integrity by ensuring that all significant emissions and removals are accounted for, and promotes transparency and accuracy through detailed GHG inventories that are submitted for international review under the UNFCCC's transparency framework. Moreover, by adhering to IPCC methods, Serbia ensures that its data is comparable with other Parties and consistent over time, allowing for reliable tracking of its emissions reductions. Refaqrding the avoidance of doublecounting as refered in Article 4 paragraph 14, Serbia's accounting approach explicitly avoids double counting by clearly separating emissions from sectors and ensuring that reductions or removals in one area (e.g., LULUCF) are not counted twice when assessing overall GHG reductions. The comprehensive GHG inventory system in place, along with the detailed tracking of sectoral emissions, supports this principle by ensuring emissions are reported once and attributed correctly. As emphasized in the MPGs, the accounting approach must uphold environmental integrity and prevent double counting. Serbia achieves this by adhering to the IPCC's sectoral guidelines and following international rules on how emissions and removals should be allocated. The system ensures that any emissions reductions are counted once, and any removals (especially from LULUCF) are appropriately tracked and distinguished, preventing over or under estimation of progress toward the NDC. **Consistency with the Decision 4/CMA.1** Serbia's approach aligns with this decision by: • Clearly defining the scope of its NDC accounting, particularly in relation to the inclusion or exclusion of LULUCF and the gases covered. This ensures that Serbia's reporting is transparent and meets the expectations set out in 4/CMA.1. • Consistently using the selected baseline year (1990 or 2010) to assess progress towards its NDC. This ensures the accounting is anchored in a clear reference point, allowing for progress to be tracked consistently over time. • Using the IPCC methodologies, as required by 4/CMA.1, to ensure accuracy in emissions measurement and consistency with international reporting standards. • Regular updates and transparency reporting: Serbia submits regular GHG inventories under the enhanced transparency framework of the UNFCCC, as stipulated by decision 4/CMA.1, ensuring that the international community can assess the country's progress and verify its adherence to its NDC.
For the second and subsequent NDC under Article 4, and optionally for the first NDC under Article 4:[b]	
Information on the accounting approach used is consistent with paragraphs 13–17 and annex II of decision 4/CMA.1 (para. 72 of the MPGs)	NA
Explain how the accounting for anthropogenic emissions and removals is in accordance with methodologies and common metrics assessed by the IPCC and in accordance with decision 18/CMA.1 (para. 1(a) of annex II to decision 4/CMA.1)	NA
Explain how consistency has been maintained between any GHG data and estimation methodologies used for accounting and the Party's GHG inventory, pursuant to Article 13, paragraph 7(a), of the Paris Agreement, if applicable (para. 2(b) of annex II to decision 4/CMA.1) diversification plans:	NA

Reporting requirement	*Description or reference to the relevant section of the BTR*
Explain how overestimation or underestimation has been avoided for any projected emissions and removals used for accounting (para. 2(c) of annex II to decision 4/CMA.1)	NA
For each NDC under Article 4:[c]	
Accounting for anthropogenic emissions and removals in accordance with methodologies and common metrics assessed by the IPCC and adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement:	
Each methodology and/or accounting approach used to assess the implementation and achievement of the target(s), as applicable (para. 74(a) of the MPGs)	Serbia's accounting approach for tracking "total GHG emissions" is grounded in internationally recognized principles, specifically those outlined by the Intergovernmental Panel on Climate Change (IPCC) guidelines. These guidelines provide a consistent framework for estimating and reporting emissions, ensuring the integrity and accuracy of Serbia's GHG data.
Each methodology and/or accounting approach used for the construction of any baseline, to the extent possible (para. 74(b) of the MPGs)	The methodology for preparation of the indicator is the same as the one for the preparation of the NDC target and methodology pre preparation of GHG inventory for the Republic of Serbia, which is prepared according to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (or where appropriate 2019 Refinement of the IPCC Guidelines) for emission estimations of greenhouse gases which result from anthropogenic activities: CO2, CH4, N2O, HFCs, PFCs, SF6 and NF3. For some subsectors, the IPCC 2019 refinements have been implemented but this is not the case for all subsectors concerned. The emission calculations are developed for each emission source according to the CRT nomenclature. To calculate the percentage reduction in GHG emissions, Serbia follows a formula that compares current emissions with the emissions in a base year (1990 or 2010), depending on which baseline is selected for the NDC. The process involves three key steps: 1. Establish the Baseline Year Emissions 2. Determine Current/Target Year Emissions 3. Use general formula for assessment of the Percentage Reduction
If the methodology or accounting approach used for the indicator(s) in table 1 differ from those used to assess the implementation and achievement the target, describe each methodology or accounting approach used to generate the information generated for each indicator in the tables 4 and 5 (para. 74(c) of the MPGs)	NA
Any conditions and assumptions relevant to the achievement of the NDC under Article 4, as applicable and available (para. 75(i) of the MPGs)	NA
Key parameters, assumptions, definitions, data sources and models used, as applicable and available (para. 75(a) of the MPGs)	NA
IPCC Guidelines used, as applicable and available (para. 75(b) of the MPGs)	2006 IPCC guidelines used, in some isolated cases emission factors from 2019 Refinement has been used. The use is consistent for NDC target and the selected indicator
Report the metrics used, as applicable and available (para. 75(c) of the MPGs)	The indicator is expressed in "CO2e" which aggregates all gasses expressed as CO2e using the GWP from the IPCC Fifth Assessment Report, using 100-year time horizon metric

Reporting requirement	*Description or reference to the relevant section of the BTR*
For Parties whose NDC cannot be accounted for using methodologies covered by IPCC guidelines, provide information on their own methodology used, including for NDCs, pursuant to Article 4, paragraph 6, of the Paris Agreement, if applicable (para. 1(b) of annex II to decision 4/CMA.1)	NA
Provide information on methodologies used to track progress arising from the implementation of policies and measures, as appropriate (para. 1(d) of annex II to decision 4/CMA.1)	Serbia does not include the implementation of policies and measures
Where applicable to its NDC, any sector-, categoryor activity-specific assumptions, methodologies and approaches consistent with IPCC guidance, taking into account any relevant decision under the Convention, as applicable (para. 75(d) of the MPGs)	NA
For Parties that address emissions and subsequent removals from natural disturbances on managed lands, provide detailed information on the approach used and how it is consistent with relevant IPCC guidance, as appropriate, or indicate the relevant section of the national GHG inventory report containing that information (para. 1(e) of annex II to decision 4/CMA.1, para. 75(d)(i) of the MPGs)	NA
For Parties that account for emissions and removals from harvested wood products, provide detailed information on which IPCC approach has been used to estimate emissions and removals (para. 1(f) of annex II to decision 4/CMA.1, para. 75(d)(ii) of the MPGs)	NA
For Parties that address the effects of age-class structure in forests, provide detailed information on the approach used and how this is consistent with relevant IPCC guidance, as appropriate (para. 1(g) of annex II to decision 4/CMA.1, para. 75(d)(iii) of the MPGs)	NA
How the Party has drawn on existing methods and guidance established under the Convention and its related legal instruments, as appropriate, if applicable (para. 1(c) of annex II to decision 4/CMA.1)	NA
Any methodologies used to account for mitigation cobenefits of adaptation actions and/or economic diversification plans (para. 75(e) of the MPGs	NA

Reporting requirement	*Description or reference to the relevant section of the BTR*
Describe how double counting of net GHG emission reductions has been avoided, including in accordance with guidance developed related to Article 6 if relevant (para. 76(d) of the MPGs)	NA
Any other methodologies related to the NDC under Article 4 (para. 75(h) of the MPGs)	NA
Ensuring methodological consistency, including on baselines, between the communication and implementation of NDCs (para. 12(b) of the decision 4/CMA.1):	
Explain how consistency has been maintained in scope and coverage, definitions, data sources, metrics, assumptions and methodological approaches including on baselines, between the communication and implementation of NDCs (para. 2(a) of annex II to decision 4/CMA.1)	NA
Explain how consistency has been maintained between any GHG data and estimation methodologies used for accounting and the Party's GHG inventory, pursuant to Article 13, paragraph 7(a), of the Paris Agreement, if applicable (para. 2(b) of annex II to decision 4/CMA.1) and explain methodological inconsistencies with the Party's most recent national inventory report, if applicable (para. 76(c) of the MPGs)	NA
For Parties that apply technical changes to update reference points, reference levels or projections, the changes should reflect either of the following (para. 2(d) of annex II to decision 4/CMA.1):	
Technical changes related to technical corrections to the Party's inventory (para. 2(d)(i) of annex II to decision 4/CMA.1)	NA
Technical changes related to improvements in accuracy that maintain methodological consistency (para. 2(d)(ii) of annex II to decision 4/CMA.1)	NA
Explain how any methodological changes and technical updates made during the implementation of their NDC were transparently reported (para. 2(e) of annex II to decision 4/CMA.1)	NA
Striving to include all categories of anthropogenic emissions or removals in the NDC and, once a source, sink or activity is included, continuing to include it (para. 3 of annex II to decision 4/CMA.1):	

Reporting requirement	*Description or reference to the relevant section of the BTR*
Explain how all categories of anthropogenic emissions and removals corresponding to their NDC were accounted for (para. 3(a) of annex II to decision 4/CMA.1)	Same IPCC dissagregation and categorisation, scope and metrics is used for NDC traget and NDC tracking indicator
Explain how Party is striving to include all categories of anthropogenic emissions and removals in its NDC, and, once a source, sink or activity is included, continue to include it (para. 3(b) of annex II to decision 4/CMA.1)	NA
Provide an explanation of why any categories of anthropogenic emissions or removals are excluded (para. 4 of annex II to decision 4/CMA.1)	NA
Each Party that participates in cooperative approaches that involve the use of ITMOs towards an NDC under Article 4, or authorizes the use of mitigation outcomes for international mitigation purposes other than achievement of its NDC	
Provide information on any methodologies associated with any cooperative approaches that involve the use of ITMOs towards an NDC under Article 4 (para. 75(f) of the MPGs)	NA
Provide information on how each cooperative approach promotes sustainable development, consistent with decisions adopted by the CMA on Article 6 (para. 77(d)(iv) of the MPGs)	NA
Provide information on how each cooperative approach ensures environmental integrity consistent with decisions adopted by the CMA on Article 6 (para. 77(d)(iv) of the MPGs)	NA
Provide information on how each cooperative approach ensures transparency, including in governance, consistent with decisions adopted by the CMA on Article 6 (para. 77(d)(iv) of the MPGs)	NA
Provide information on how each cooperative approach applies robust accounting to ensure, inter alia, the avoidance of double counting, consistent with decisions adopted by the CMA on Article 6 (para. 77(d)(iv) of the MPGs)	NA
Any other information consistent with decisions adopted by the CMA on reporting under Article 6 (para. 77(d)(iii) of the MPGs)	NA

Notes: (1) Pursuant to para. 79 of the MPGs, each Party shall report the information referred to in paras. 65–78 of the MPGs in a narrative and common tabular format, as applicable. (2) A Party may amend the reporting format (e.g. Excel file) to remove specific rows in this table if the information to be provided in those rows is not applicable to the Party's NDC under Article 4 of the Paris Agreement, in accordance with the MPGs.

[a] For the first NDC under Article 4, each Party shall clearly indicate and report its accounting approach, including how it is consistent with Article 4, paras. 13–14, of the Paris Agreement (para. 71 of the MPGs)

[b] For the second and subsequent NDC under Article 4, each Party shall provide information referred to in chapter III.B and C of the MPGs consistent with decision 4/CMA.1. Each Party shall clearly indicate how its reporting is consistent with decision 4/CMA.1 (para. 72 of the MPGs). Each Party may choose to provide information on accounting of its first NDC consistent with decision 4/CMA.1 (para. 71 of the MPGs).

CTF Table 4. Structured summary: Tracking progress made in implementing and achieving the NDC under Article 4 of the Paris Agreement[a]

	Unit, as applicable	*Reference point(s), level(s), baseline(s), base year(s) or starting point(s){MPGs, p. 67, 77(a)(i)}*	*Implementation period of the NDC covering information for previous reporting years and the most recent year, including the end year or end of period {MPGs, p. 68, 77(a)(ii–iii)}*					*Target level[b]*	*Target year or period*	*Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s) (paras. 69–70 of the MPGs)*
			2021	2022	…	…	…	End Year		
Indicator(s) selected to track progress towards the implementation and/or achievement of the NDC under Article 4 of the Paris Agreement[c]: {MPGs, p. 65, 77(a)}										
Total GHG emissions (without LULUCF) in CO2eq"	**kt CO2 eq**	**63.779,990**	**61.741,582**	**62.559,376**				**55.138,77**	**2030**	***The most recent level of indicator is 1,9% below the Base year and 24.3% below the 1990 GHG emission levels***
{Parties can add rows for each additional indicator and supporting information for each indicator, e.g. baseline values, baseline for the portion of NDC, target values, mitigation effects of policies and measures, etc.}										
Where applicable, total GHG emissions and removals consistent with the coverage of the NDC *{MPGs, p. 77(b)}*	**kt CO2 eq**	**63.779,990**	**61.741,582**	**62.559,376**				**55.138,77**	**2030**	
Contribution from the LULUCF sector for each year of the target period or target year, if not included in the inventory time series of total net GHG emissions and removals, as applicable *{MPGs, p. 77(c)}*	NA	NA	NA	NA			NA	NA	NA	
Each Party that participates in cooperative approaches that involve the use of ITMOs towards an NDC under Article 4 of the Paris Agreement, or authorizes the use of mitigation outcomes for international mitigation purposes other than achievement of the NDC, shall provide: *{MPGs, p. 77(d)}*										
If applicable, an indicative multi-year emissions trajectory, trajectories or budget for its NDC implementation period (para. 7(a)(i), annex to decision -/CMA.3)	NA	NA	NA	NA			NA	NA		
If applicable, multi-year emissions trajectory, trajectories or budget for its NDC implementation period that is consistent with the NDC (para. 7(b), annex to decision -/CMA.3)	NA	NA	NA	NA			NA	NA		
Annual anthropogenic emissions by sources and removals by sinks covered by its NDC or, where applicable, from the emission or sink categories as identified by the host Party pursuant to paragraph 9 of annex to decision -/CMA.3 (para. 23(a), annex to	NA	NA	NA	NA			NA			

decision -/CMA.3) (as part of para. 77 (d)(i) information)										
Annual anthropogenic emissions by sources and removals by sinks covered by its NDC or, where applicable, from theportion of its NDC in accordance with paragraph 10, annex to decision -/CMA.3 (para. 23(b), annex to decision -/CMA.3)	NA	NA	NA	NA	NA	NA				
If applicable, annual level of the relevant non-GHG indicator that is being used by the Party to track progress towards the implementation and achievement of its NDC and was selected pursuant to paragraph 65, annex to decision 18/CMA.1 (para. 23(i), annex, decision -/CMA.3)	NA	NA	NA	NA	NA					
Annual quantity of ITMOs first transferred (para. 23(c), annex to decision -/CMA.3) (para. 77(d)(ii) of the MPGs)	NA	NA	NA	NA	NA	-	-	-	-	
Annual quantity of mitigation outcomes authorized for use for other international mitigation purposes and entities authorized to use such mitigation outcomes, as appropriate (para 23(d), annex to decision -/CMA.3) (para. 77(d)(ii) of the MPGs)	NA	NA	NA	NA	NA					
Annual quantity of ITMOs used towards achievement of the NDC (para. 23(e), annex to decision -/CMA.3) (para. 77(d)(ii) of the MPGs)	NA	NA	NA	NA	NA					
Net annual quantity of ITMOs resulting from paras. 23(c)-(e), annex to decision -/CMA.3 (para. 23(f), annex to decision -/CMA.3)	NA	NA	NA	NA	NA					
If applicable, the cumulative amount of ITMOs, divided by the number of elapsed years in the NDC implementation period (para. 7(a)(ii), annex to decision -/CMA.3)	NA	NA	NA	NA	NA	NA				
Total quantitative corresponding adjustments used to calculate the emissions balance referred to in para. 23(k)(i), annex to decision -/CMA.3, in accordance with the Party's method for applying corresponding adjustments consistent with section III.B, annex to decision -/CMA.3 (Application of corresponding adjustments) (para. 23(g), annex to decision -/CMA.3)	NA	NA	NA	NA	NA					
The cumulative information in respect of the annual information in para. 23(f), annex to decision -/CMA.3, as applicable (para. 23(h), annex to decision -/CMA.3)	NA	NA	NA	NA	NA					

For metrics in tonnes of CO2 eq. or non-GHG, an annual emissions balance consistent with chapter III.B (Application of corresponding adjustment), annex, decision -/CMA.3 (para. 23(k)(i), annex to decision -/CMA.3) (as part of para. 77 (d)(ii) of the MPGs)	NA	NA	NA	NA	NA				
Any other information consistent with decisions adopted by the CMA on reporting under Article 6 (para. 77(d)(iii) of the MPGs)	NA	NA	NA	NA	NA				
Assessment of the achievement of the Party's NDC underArticle 4 of the Paris Agreement (para. 70 of the MPGs):									
Restate the target of the Party's NDC:	NA					-	-	-	-
Information for reference point(s), level(s), baseline(s), base year(s), or starting point(s):	NA								
Final information for the indicator for the target year/period, including the application of the necessary corresponding adjustments consistent with chapter III, annex, decision -/CMA.3 (Corresponding adjustments) and consistent with future decisions from the CMA (para. 23(l), annex to decision -/CMA.3):	NA								
Comparison:	NA								
Achievement of NDC: {yes/no, explanation}	NA								

Notes: (1) Pursuant to para. 79 of the MPGs, each Party shall report the information referred to in paras. 65–78 of the MPGs in a narrative and common tabular format, as applicable. (2) A Party may amend the reporting format (e.g. Excel file) to remove specific rows in this table if the information to be provided in those rows is not applicable to the Party's NDC under Article 4 of the Paris Agreement, in accordance with the MPGs. (3) The Party could add rows for each additional selected indicator.

[a]This table could be used for each NDC target in case Party's NDC has multiple targets.

[b] Parties may provide information on conditional targets in a documentation box with references to the relevant page in their biennial transparency report.

CTF Table 5. Mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement [a, b]

No.	*Name [c]*	*Description [d,e, f]*	*Objectives*	*Type of instrument [g]*	*Status [h]*	*Sector(s) affected [i]*	*Gases affected*	*Start year of implementation*	*Implementing entity or entities*	*Estim redu* / *Achie*
M1	*Implementation of equivalent measures and transition to emission trading*	*Implementation of the carbon emissions prices expected to have a significant impact on the evolution of the energy supply and the ETS sectors of the Demand Side. Power and heat generation are expected to be significantly affected, making the carbon emissions price the most influential measure for the reduction of CO2 emissions. The increase of electricity prices, as the cost of the CO2 allowances is internalized in the price paid by the final consumer, provides the incentive to market participants either to move to zero or lower emitting fuels (RES, natural Gas) or adopting processes (industrial sector) less energy intensive and producing higher added value, or promoting energy efficiency in order to reduce demand for electricity*	*Decarbonisation of Energy intensive sectors*	*Regulatory, economic*	*planned*	*Energy, IPPU*	*CO2, N2O*	*No earlier then 2026*	Ministry of Environmental Protection, Ministry of Finance	*N*
M2	*Increasing the use of RES in electricity production*	*Support scheme based on tendering procedures (auction scheme) for commercially cost-effective RES technologies aiming to ensure 2,6GW of wind parks and photovoltaic plants. Transition from feed in tariffs to auctions is planned for 2026*	*Decarbonisation of Electricity production*	*Economic*	*implemented*	*Energy*	*CO2*	*[2022]*	Ministry of Mining and Energy	*49*
M3	*Support RES technologies that will not participate into the tendering procedures*	*The policy will foresee the potential provision of economic support to the renewable energy sources, which will not participate into the planned auctions within the framework of measure No.2, primarily for small scale-decentralized RES systems. The economic support will be differentiated for each renewable energy source separately according to their operational characteristics in order to ensure that a fair and transparent profitability will be given to the investors. The measure aim to enable 0,5GW of small scale decentralised PV systems*	*Decarbonisation of Electricity production*	*Economic*	*planned*	*Energy*	*CO2*	*2025*	Ministry of Mining and Energy	*N*
M4	*Economic support to innovative and demonstration pilot RES projects*	*The measure aim to provide financial and fiscal incentives, such as investment aid, tax exemptions or reductions, tax refunds, to innovative and demonstration projects under the precondition that they lead to a considerable increase of the national value added and address significant local energy needs. The installation of floating photovoltaics and vertical wind turbines, the promotion of small wind turbines, the construction of concentrated solar power plants and the development enhanced geothermal systems comprise indicative innovative and demonstration pilot RES projects, which should be examined.*	*Decarbonisation of Electricity production*	*Economic*	*planned*	*Energy*	*CO2*	*2025*	Ministry of Mining and Energy	*N*
M5	*Carbon pricing and excise duties on energy*	*The introduction of carbon pricing and of appropriate levels of excise duties as a policy instrument, enables implementation of the polluter pays principle in the sectors and activities not covered by equivalent measures. The purpose if this, is to make fossil fuels less competitive for use by final consumers, compared to sustainable biomass or other less carbon intensive fuels. In the medium-term, appropriate carbon pricing is an important driver for consumer to redirect investment to low or zero carbon technologies and in energy efficiency. Recycling of funds collected from carbon pricing should be used to support implementation of measures reducing GHG emissions by final consumers such as households, commercial and institutional sector and industry.*	*Decarbonisation of Other sectrors*	*Economic*	*planned*	*Energy*	*CO_2*	*2025*	*Ministry of Finances*	*N*
M6	*Improving energy efficiency in industry*	*Improving energy efficiency in the energy intensive industrial sector is crucial to enhance competitiveness. The industrial sector will have to promote and implement energy efficiency projects and employ best available technology (BAT) to retain its competitive advantage*	*Decarbonisation of Manufacturing industry*	*Regulatory, economic*	*planned*	*Energy*	*CO_2*	*2025*	*Ministry of Mining and Energy*	*N*
M7	*Improving thermal integrity of households*	*Improving thermal integrity households reduces heating and cooling needs, consequently reducing energy costs as well as investment costs in heating and cooling infrastructure. There is an estimate that 85% of current buildings do not fulfil minimum energy efficiency requirements*	*Emission reductions in households*	*Regulatory, economic*	*planned*	*Energy*	*CO_2*	*2025*	*Ministry of Construction, Transport and Infrastructure*	*N*
M 8	*Energy efficiency, improvement of heating and cooling infrastructure and promotion of use of RES in households*	*A large share of single-family houses predominantly uses old inefficient boilers on coal and wood biomass. Coal combustion causes high specific CO2 emissions, while coal and biomass use in inefficient boilers also cause high emissions of PM2.5, which has adverse effects on health. More efficient boilers reduce fuel use, while also decreasing emissions since they have better efficiency*	*Emission reductions in households*	*Regulatory, economic*	*planned*	*Energy*	*CO_2*	*2025*	*Ministry of Mining and Energy*	*N*

No.	Name [c]	Description [d,e, f]	Objectives	Type of instrument [g]	Status [h]	Sector(s) affected [i]	Gases affected	Start year of implementation	Implementing entity or entities	Estim reduc Achie
M 9	Improving energy efficiency and use of RES and thermal integrity in the Tertiary sector	Commercial and institutional buildings represent important opportunities for the application of energy efficiency measures, as they are professionally managed and their respective owners and/or managers are sensitive to energy costs, which are projected to increase (through the inclusion of the carbon price in electricity and of the carbon pricing on fuels	Emission reductions in commercial and instoitutional sector	Regulatory, economic	planned	Energy	CO_2	2025	Administration for Joint Services of the Republic Bodies, Ministry of Mining and Energy	N
M 10	Renewal of the passenger fleet and promotion of sustainable passenger transport	Measure focuses on improving vehicle efficiency by aligning Serbia's regulations with EU standards, controlling the import of old vehicles, reforming taxation to incentivize low-emission vehicles, promoting electric vehicles through subsidies, leveraging public procurement, and investing in EV infrastructure.	Emission reductions in transport sector	Regulatory, economic	planned	Energy	CO_2	2025	Ministry of Environmental Protection, Ministry of Finance	N
M 11	Renewal of the freight fleet and promotion of sustainable freight transport	Freight transport is necessary for economic growth and normally witnessing higher growth rates than GDP. As such, in a context where Serbia's GDP will continue to grow and freight more than the GDP, it is important to find modalities to limit from this source, without necessarily limiting freight and growth. Serbia lies on X. and XI. Corridors experiencing high freight flows also from abroad. These will heavily increase when Serbia joins the EU, as has also been experienced by other countries joining EU, due to free trade and movement of goods	Emission reductions in transport sector	Regulatory, economic	planned	Energy	CO_2	2025	Ministry of Construction, Transport and Infrastructure	N
M 12	Implementation of the F-gas Regulation and Mobile Air Conditioning (MAC) Directive	The European Union has adopted revised F-gas regulation (517/2014), replacing the previous version (842/2006), which entered into force on 1st January 2015. The regulation is designed to reduce emissions of fluorinated greenhouse gases (F-gases) by two thirds of 2017's levels by 2030. The Regulation retains many important and successful features of the previous F-Gas Regulation related to leak prevention, F-gas recovery and technical training; key additional instruments that have to be transposed and implemented are: • Product and equipment ban: restrictions on the placing on the market (bans) of certain refrigeration and air conditioning equipment, foams and propellants using F-gases, and of SF_6 in small magnesium foundries.• Service and maintenance bans: Limits on the use of higher GWP gases, such as R404A and R507A, in existing refrigeration equipment from 2023.• Cap and phase down: Reductions on the placing on the market of F-gases via a cap and phase down on the supply of HFCs.	Emission reductions of F-gasses	Regulatory, other	planned	Energy	HFC, SF_6	2025	Ministry of Environmental Protection	N
M 13	Winter Cover Crops	The planting of winter cover crops is generally assessed as having positive effects for the management of soil erosion, soil fertility, soil quality, water, and weeds, as well as for biodiversity and the mitigation of GHG emissions. The area for cover crops is limited to the area not covered by regular crops during the winter season. Winter cover crops do not produce a market output, but have costs for machinery, other inputs and seed. If winter cover crops are legumes, the bio-fixation will reduce fertilizer demand of the main future crops	Reducing emissions from Agriculture	Other	planned	Agriculture	CO_2, N_2O	2025	Ministry of Agriculture, Forestry and Water Management	N
M 14	Increased legume share in fodder area	Legumes on temporary grassland increase bio-fixation and, therefore, reduce fertiliser needs. It is assumed that the legume share on temporary grassland can be increased to a maximum of 20%, which is equivalent to a nitrogen fixation rate of 15%.	Reducing emissions from Agriculture	Other	planned	Agriculture	CO_2, N_2O	2025	Ministry of Agriculture, Forestry and Water Management	N
M 15	Afforestation	This measure prescribes the afforestation of 5.000 ha every year up to 2030 (and should be continued up to 2050). This requires the additional afforestation of 2952 ha, compared to the current average level of 2048 ha.	Engancement of sinks in LULUCF sector	Regulatory, other	planned	LULUCF	CO_2	2026	Ministry of Agriculture, Forestry and Water Management	N
M 16	Conversion of coppice to high forest	This measure prescribes the annual conversion of 7.000 ha of coppice forest to high forests, in particular oak and beech coppice forests for conversion into high forest. At the present, the government is financing amelioration of forests, which also includes direct conversion of coppice forests. Direct conversion of coppice forests is a process consisting of clear cut of certain areas and then artificial planting. This measure is available for both State and private forests	Engancement of sinks in LULUCF sector	Regulatory, other	planned	LULUCF	CO_2	2026	Ministry of Agriculture, Forestry and Water Management	N

No.	Name [c]	Description [d,e, f]	Objectives	Type of instrument [g]	Status [h]	Sector(s) affected [i]	Gases affected	Start year of implementation	Implementing entity or entities	Estim reduc Achie
M 17	Short Rotation Plantations (SRP)	This measure proposes an area of additional 1500 hectares annually to be established using poplars and willows as the main tree species. Annual increment in SRP is 10 m3/ha up to age 10, and 18 m3/ha after that. The biomass from short rotation plantation will serve as a source of bioenergy for combined heat and power plants	Engancement of sinks in LULUCF sector	Regulatory, other	planned	LULUCF	CO_2	2026	Ministry of Agriculture, Forestry and Water Management	N
M 18	Regeneration of over mature stands	The objective is to remove over mature trees from the forest stands which have low production capacity (even negative CO2 effects) and establish naturally or artificially new forest stands with high productivity (group mixture where is possible). This is of significant importance for the forestry and climate change sectors, since the annual increment of over matured stands is only 3 m3/ha and their absorption capacity is negligible, compared to increment of young stands of 8 m3/ha.	Engancement of sinks in LULUCF sector	Regulatory, other	planned	LULUCF	CO_2	2026	Ministry of Agriculture, Forestry and Water Management	N
M 19	Climate change education, training for new skills and awareness raising	Combating climate change requires change in behaviour of all actors in society: from top level decision making at public and private levels, to daily consumption patterns. Change is best operated through a multitude of stimulus, which can effectively be provided through education, training for new skills and awareness raising.	Supporting activities targeting all relevant sectors	Other	planned	All sectors	CO_2, CH_4, N_2O	2025	Ministry of Environmental Protection	N
20	Adaptation actions with mitigation co-benefits	NA	NA	NA	NA	NA	NA	NA	NA	N
21	Adaptation actions with mitigation co-benefits	NA	NA	NA	NA	NA	NA	NA	NA	N

Custom footnotes:

Documentation box:

[a] Each Party shall provide information on actions, policies and measures that support the implementation and achievement of its NDC under Article 4 of the Paris Agreement, focusing on those that have the most significant impact on GHG emissions or removals and those impacting key categories in the national GHG inventory. This information shall be presented in narrative and tabular format (para. 80 of the MPGs).

[b] For each Party with an NDC under Article 4 of the Paris Agreement that consists of mitigation co-benefits resulting from Parties' adaptation actions and/or economic diversification plans consistent with Article 4, para. 7, information to be reported under paras. 80, 82 and 83 of the MPGs includes relevant information on policies and measures contributing to mitigation cobenefits resulting from adaptation actions or economic diversification plans (para. 84 of the MPGs).

[c] Parties may indicate whether a measure is included in the 'with measures' projections.

[d] Additional information may also be provided on the cost of the mitigation actions, non-GHG mitigation benefits, and how the mitigation action interacts with other mitigation actions, as appropriate (para. 83(a–c) of the MPGs)

[e] Parties should identify actions, policies and measures that influence GHG emissions from international transport (para. 88 of the MPGs).

[f] Parties should, to the extent possible, provide information about how actions, policies and measures are modifying longer-term trends in GHG emissions and removals (para. 89 of the MPGs).

[g] Parties shall, to the extent possible, provide information on the types of instrument: regulatory, economic instrument or other (para. 82(d) of the MPGs).

[h] Parties shall, to the extent possible, use the following descriptive terms to report on status of implementation: planned, adopted or implemented (para. 82(e) of the MPGs).

[i] Parties shall, to the extent possible, provide information on sector(s) affected: energy, transport, industrial processes and product use, agriculture, LULUCF, waste management or other (paras. 81 and 82(f) of the MPGs).

[j] Each Party shall provide, to the extent possible, estimates of expected and achieved GHG emission reductions for its actions, policies and measures in the tabular format; those developing country Parties that need flexibility in the light of their capacities with respect to this provision are instead encouraged to report this information (para. 85 of the MPGs).

[k] To the extent available, each Party shall describe the methodologies and assumptions used to estimate the GHG emission reductions or removals due to each action, policy and measure. This information may be presented in an annex to the biennial transparency report (para. 86 of the MPGs).

Source: Decision 5/CMA.3. Guidance operationalizing the modalities, procedures and guidelines for the enhanced transparency framework referred to in Article 13 of the Paris Agreement. In Annex II.

CTF Table 6. Summary of greenhouse gas emissions and removals in accordance with the common reporting table 10 emission trends –summary

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO2 emissions/ removals	CH4	N2O	HFCs (1)	PFCs (1)	Unspecified mix of HFCs and PFCs (1)	SF6	NF3	NOx	CO	NMVOC	SOX	Total GHG emissions/removals (2)
	(kt)			CO2 equivalents (kt) (3)			(kt)						CO2 equivalents (kt) (3)
Total national emissions and removals	**66.296,57**	**439,56**	**9,49**	**-**	**NA**		**5,79**						**81.254,90**
1. Energy	**62.918,69**	**110,64**	**1,12**										**66.312,63**
1.A. Fuel combustion	61.420,47	17,19	1,09										**62.191,71**
1.A.1. Energy industries	42.549,36	0,45	0,57										**42.712,65**
1.A.2. Manufacturing industries and construction	7.811,34	0,28	0,05										**7.832,86**
1.A.3. Transport	4.470,98	1,07	0,22										**4.559,93**
1.A.4. Other sectors	6.588,80	15,38	0,25										**7.086,26**
1.A.5. Other	-	-	-										**-**
1.B. Fugitive emissions from fuels	1.498,21	93,45	0,02										**4.120,93**
1.B.1. Solid fuels	-	38,82	-										**1.086,87**
1.B.2. Oil and natural gas and other emissions from energy production	1.498,21	54,64	0,02										**3.034,06**
1.C. CO2 Transport and storage	-												**-**
2. Industrial processes and product use	**4.796,57**	**0,70**	**2,13**	**-**	**NA**	**NA**	**5,79**						**5.515,64**
2.A. Mineral industry	2.023,81												**2.023,81**
2.B. Chemical industry	788,23	0,70	2,13	-	NA	NA	-						**1.371,29**
2.C. Metal industry	1.726,78	-	-	-	NA	NA	5,79						**1.862,80**
2.D. Non-energy products from fuels and solvent use	257,74	-	-										**257,74**
2.E. Electronic industry				-	NA	BA	-						**-**
2.F. Product uses as substitutes for ODS				-	NO	NA	-						**-**
2.G. Other product manufacture and use	-	-	-	-	NE	NA	-						**-**
2.H. Other (4)	-	-	-	-	NA	NA	-						**-**
3. Agriculture	**32,18**	**178,52**	**5,69**										**6.538,16**
3.A. Enteric fermentation		146,08											**4.090,37**
3.B. Manure management		29,37	2,45										**1.472,92**
3.C. Rice cultivation		-											**-**
3.D. Agricultural soils		-	3,15										**835,76**
3.E. Prescribed burning of savannahs		-	-										**-**
3.F. Field burning of agricultural residues		3,07	0,08										**106,92**
3.G. Liming	-												**-**
3.H. Urea application	32,18												**32,18**
3.I. Other carbon-containing fertilizers	-												**-**
3.J. Other	-	-	-										**-**
4. Land use, land-use change and forestry (5)	**- 1.450,86**	**0,47**	**0,10**										**- 1.411,93**
4.A. Forest land (5)	- 2.023,11	0,27	0,01										**- 2.011,68**
4.B. Cropland (5)	18,59	-	- 0,00										**18,51**
4.C. Grassland (5)	339,33	0,21	0,04										**354,43**
4.D. Wetlands (5)	169,98	-	0,03										**178,95**
4.E. Settlements (5)	70,55	-	0,01										**73,12**
4.F. Other land (5)	24,01	-	0,00										**24,96**
4.G. Harvested wood products (5)	- 50,21												**- 50,21**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO2 emissions/ removals	CH4	N2O	HFCs (1)	PFCs (1)	Unspecified mix of HFCs and PFCs (1)	SF6	NF3	NOx	CO	NMVOC	SOX	Total GHG emissions/removals (2)
	(kt)			CO2 equivalents (kt) (3)			(kt)						CO2 equivalents (kt) (3)
4.H. Other (5)	-	-	-										-
5. Waste	**-**	**149,23**	**0,46**										**4.300,39**
5.A. Solid waste disposal (6)		**108,83**											**3.047,26**
5.B. Biological treatment of solid waste		-	-										-
5.C. Incineration and open burning of waste (6)	-	-	-										-
5.D. Wastewater treatment and discharge		40,40	0,46										1.253,14
5.E. Other (6)	-	-	-										-
6. Other (please specify) (7)	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**					**0**

Memo items: (8)													
1.D.1. International bunkers	**430**	**0**	**0**										**430,43**
1.D.1.a. Aviation	430	0	0										**430,43**
1.D.1.b. Navigation	NA	NA	NA										**NA**
1.D.2. Multilateral operations	**NA**	**NA**	**NA**										**NA**
1.D.3. CO2 emissions from biomass	**7.711,35**												**7.711,35**
1.D.4. CO2 captured	**0**												**-**
5.F.1. Long-term storage of C in waste disposal sites	**586,20**												**586,20**
Indirect N2O													**-**

Indirect CO2	NA												**NA**

CTF Table 7. Information on projections of greenhouse gas emissions and removals under a 'with measures' scenario[a,b]

	Most recent year in the Party's national inventory report (kt CO2 eq)[c]	*Projections of GHG emissions and removals, (kt CO2 eq)[c]*		
	2022	*2025*	*2030*	*2035*
Sector[d]				
Energy	49.327,58	47.217,28	42.537,33	34.537,33
Transport	8.167,13	7.406,38	7.433,15	6.725,82
Industrial processes and product use	5.141,14	5.178,35	4.994,02	4.329,42
Agriculture	4.866,50	4.812,78	4.493,23	4.694,01
LULUCF	-4.548,89	-5.514,00	-4.733,00	-3.981,25
Waste	3.224,17	2.581,72	2.371,25	2.227,11
Other (specify)				
Gas				
CO2 emissions including net CO2 from LULUCF	46.875,51	43.426,07	39.682,35	32.273,57
CO2 emissions excluding net CO2 from LULUCF	51.445,76	48.919,16	44.395,44	36.235,91
CH4 emissions including CH4 from LULUCF	8.706,03	6.533,45	5.902,67	5.224,10
CH4 emissions excluding CH4 from LULUCF	8.700,32	6.527,74	5.897,16	5.218,79
N2O emissions including N2O from LULUCF	2.216,21	3.563,12	3.339,30	3.568,39
N2O emissions excluding N2O from LULUCF	2.200,56	3.547,92	3.324,90	3.554,79
HFCs	161,47	680,46	678,39	702,11
PFCs	NO	NO	NO	NO
SF6	51,27	114,85	99,95	76,27
NF3	NO	NO	NO	NO
Other (specify)	-			-
Total with LULUCF	58.010,49	54.276,12	49.662,84	41.806,62
Total without LULUCF	62.559,38	59.790,12	54.395,84	45.787,87

[a] Each Party shall report projections pursuant to paras. 93–101 of the MPGs; those developing country Parties that need flexibility in the light of their capacities are instead encouraged to report such projections (para. 92 of the MPGs).

[b] Those developing country Parties that need flexibility in the light of their capacities with respect paras. 93–101 of the MPGs can instead report using a less detailed methodology or coverage (para. 102 of the MPGs).

[c] Projections shall begin from the most recent year in the Party's national report and extend at least 15 years beyond the next year ending in zero or five; those developing country Parties that need flexibility in the light of their capacities with respect to this provision have the flexibility to instead extend their projections at least to the end point of their NDC under Article 4 of the Paris Agreement (para. 95 of the MPGs).

[d] In accordance with para. 82(f) of the MPGs.

Note: Values for "Energy" sector includes all GHG emissions under the IPCC Category 1.

CTF Table 8. Information on projections of greenhouse gas emissions and removals under a 'with additional measures' scenario[a] [b]

	Most recent year in the Party's national inventory report (kt CO2 eq)[c]	*Projections of GHG emissions and removals, (kt CO2 eq)[c]*		
	2022	*2025*	*2030*	*2035*
Sector[d]				
Energy	49.328	43.396	36.058	17.236
Transport	8.167	7.006	6.396	5.350
Industrial processes and product use	5.141	5.167	4.625	3.992
Agriculture	4.866	4.691	4.249	4.079
LULUCF	-4.549	-8.424	-9.746	-10.580
Waste	3.224	1.551	1.207	1.052
Other (specify)	-			
Gas				
CO2 emissions including net CO2 from LULUCF	46.876	36.800,88	28.070,51	8.798,13
CO2 emissions excluding net CO2 from LULUCF	51.446	45203,97	37796,59	19359,22
CH4 emissions including CH4 from LULUCF	8.706	5.391,09	4.501,52	3.379,44
CH4 emissions excluding CH4 from LULUCF	8.700	5385,38	4496,01	3374,13
N2O emissions including N2O from LULUCF	2.216	3.435,31	3.142,38	3.004,34
N2O emissions excluding N2O from LULUCF	2.201	3420,11	3127,98	2990,74
HFCs	161	680,46	638,39	571,12
PFCs	NO	NO	NO	NO
SF6	51	114,25	80,67	63,39
NF3	NO	NO	NO	NO
Other (specify)	-			
Total with LULUCF	58.010	46.380	36.394	15.779
Total without LULUCF	62.559	54.804	46.140	26.359

[a] Each Party shall report projections pursuant to paras. 93–101 of the MPGs; those developing country Parties that need flexibility in the light of their capacities are instead encouraged to report such projections (para. 92 of the MPGs).
[b] Those developing country Parties that need flexibility in the light of their capacities with respect paras. 93–101 of the MPGs can instead report using a less detailed methodology or coverage (para. 102 of the MPGs).
[c] Projections shall begin from the most recent year in the Party's national report and extend at least 15 years beyond the next year ending in zero or five; those developing country Parties that need flexibility in the light of their capacities with respect to this provision have the flexibility to instead extend their projections at least to the end point of their NDC under Article 4 of the Paris Agreement (para. 95 of the MPGs).
[d] In accordance with para. 82(f) of the MPGs.
Note: Values for "Energy" sector includes all GHG emissions under the IPCC Category 1.

CTF Table 9. Information on projections of greenhouse gas emissions and removals under a 'without measures' scenario[a,b]

	Most recent year in the Party's national inventory report (kt CO2 eq)[c]	*Projections of GHG emissions and removals, (kt CO2 eq)[c]*		
	2022	*2025*	*2030*	*2035*
Sector[d]				
Energy	49.328	51.206	51.856	54.878
Transport	8.167	7.822	8.354	8.690
Industrial processes and product use	5.141	5.384	5.671	5.952
Agriculture	4.866	5.046	4.752	4.965
LULUCF	-4.549	-5.451	-5.050	-4.828
Waste	3.224	2.582	2.371	2.227
Other (specify)	-			
Gas				
CO2 emissions including net CO2 from LULUCF	46.876	47.524,38	48.975,05	52.443,61
CO2 emissions excluding net CO2 from LULUCF	51.446	52954,47	54005,14	57252,45
CH4 emissions including CH4 from LULUCF	8.706	6.664,93	6.080,38	5.760,69
CH4 emissions excluding CH4 from LULUCF	8.700	6659,22	6074,87	5755,38
N2O emissions including N2O from LULUCF	2.216	3815,07	3670,88	4034,09
N2O emissions excluding N2O from LULUCF	2.201	3799,87	3656,48	4020,49
HFCs	161	680,46	638,39	571,12
PFCs	NO	NO	NO	NO
SF6	51	124,05	120,96	120,38
NF3	NO	NO	NO	NO
Other (specify)	-			
Total with LULUCF	58.010	58.767	59.600	63.195
Total without LULUCF	62.559	64.218	64.650	68.023

[a] Each Party shall report projections pursuant to paras. 93–101 of the MPGs; those developing country Parties that need flexibility in the light of their capacities are instead encouraged to report such projections (para. 92 of the MPGs).

[b] Those developing country Parties that need flexibility in the light of their capacities with respect paras. 93–101 of the MPGs can instead report using a less detailed methodology or coverage (para. 102 of the MPGs).

[c] Projections shall begin from the most recent year in the Party's national report and extend at least 15 years beyond the next year ending in zero or five; those developing country Parties that need flexibility in the light of their capacities with respect to this provision have the flexibility to instead extend their projections at least to the end point of their NDC under Article 4 of the Paris Agreement (para. 95 of the MPGs).

[d] In accordance with para. 82(f) of the MPGs.

Note: Values for "Energy" sector includes all GHG emissions under the IPCC Category 1.

CTF Table 10. Projections of key indicators[a,b]

Key indicator(s):[c]	Unit, as applicable	*Most recent year in the Party's national inventory report, or the most recent year for which data is available*	*Projections of key indicators[d]*		
		2022	*2025*	*2030*	*2035*
Total GHG emissions (without LULUCF) in CO2eq	[kt CO2e]	62.559	59.790	54.396	45.788
Share of RES in Electricity Generation	[%]	28,8%	35%	45,0%	60%
Share of RES in Gross final energy consumption	[%]	24,7%	29,8%	33,6%	40,8%

Note: The Party could add rows for each additional key indicator.

[a] Each Party shall report projections pursuant to paras. 93–101 of the MPGs; those developing country Parties that need flexibility in the light of their capacities are instead encouraged to report such projections (para. 92 of the MPGs).

[b] Those developing country Parties that need flexibility in the light of their capacities with respect paras. 93–101 of the MPGs can instead report using a less detailed methodology or coverage (para. 102 of the MPGs).

[c] Each Party shall also provide projections of key indicators to determine progress towards its NDC under Article 4 of the Paris Agreement (para. 97 of the MPGs).

[d] Future years extended to at least 15 years beyond the next year ending in zero or five; those developing country Parties that need flexibility in the light of their capacities with respect to this provision have the flexibility to instead extend their projections at least to the end point of their NDC under Article 4 of the Paris Agreement (para. 95 of the MPGs).

CTF Table 11. Key underlying assumptions and parameters used for projections[a,b]

Key underlying assumptions and parameters:[c]	Unit, as applicable	*Most recent year in the Party's national inventory report, or the most recent year for which data is available*	*Projections of key underlying assumptions and parameters[d]*		
		2020	*2025*	*2030*	*2035*
Population	[Million]	6,977	6,884	6,826	6,796
Households size	[inhabitants/household]	2,683	2,66	2,638	2,617
International Fuel prices - Oil	[in $'13 per boe]	59,8	76	92,2	100,3
International Fuel prices - Gas (NCV)	[in $'13 per boe]	39,4	46,7	55,2	58,9
International Fuel prices - Coal	[in $'13 per boe]	16,9	20,8	24,8	26,2
GDP	[in 000 M€13]	36,722	44,412	52,915	62,106
CO2 standards for Cars and Vans	[gCO2/km]	140	85.2	74.9	64.2
Ownership rates	[cars per capita]	0.37	0.41	0.45	0.47
Carbon taxation	[€'13/ t of CO2]	0.0	23.0	28.0	75.0

Note: The Party could add rows for each additional key underlying assumptions and parameters.

[a] Each Party shall report projections pursuant to paras. 93–101 of the MPGs; those developing country Parties that need flexibility in the light of their capacities are instead encouraged to report such projections (para. 92 of the MPGs).

[b] Those developing country Parties that need flexibility in the light of their capacities with respect to paragraphs 93–101 of the MPGs can instead report using a less detailed methodology or coverage (para. 102 of the MPGs).

[c] Information provided by each Party in describing the methodology used to develop the projections should include key underlying assumptions and parameters used for projections (e.g. gross domestic product growth rate/level, population growth rate/level) (para. 96(a) of the MPGs).

[d] Future years extended to at least 15 years beyond the next year ending in zero or five; those developing country Parties that need flexibility in the light of their capacities with respect to this provision have the flexibility to instead extend their projections at least to the end point of their NDC under Article 4 of the Paris Agreement (para. 95 of the

CTF Table 12. Information necessary to track progress on the implementation and achievement of the domestic policies and measures implemented to address the social and economicconsequences of response measures[a]

Sectors and activities associated with the response measures[b]	*Social and economic consequences of the response measures[c]*	*Challenges in and barriers to addressing the consequences[d]*	*Actions to address the consequences[e]*
NA	NA	NA	NA

[a] Each Party with an NDC under Article 4 that consists of adaptation actions and/or economic diversification plans resulting in mitigation co-benefits consistent with Article 4, para. 7, of the Paris Agreement shall provide the information necessary to track progress on the implementation and achievement of the domestic policies and measures implemented to address the social and economic consequences of response measures (para. 78 of the MPGs).

[b] In accordance with para. 78(a) of the MPGs.

[c] In accordance with para. 78(b) of the MPGs.

[d] In accordance with para. 78(c) of the MPGs.

[e] In accordance with para. 78(d) of the MPGs.

ANNEX B – Decision 5/CMA.3 Annex III: Common tabular formats for the electronic reporting of the information on financial, technology development and transfer and capacity-building support needed and received, under Articles 9–11 of the Paris Agreement

Table III.6

Information on financial support needed by the Republic of Serbia under Article 9 of the Paris Agreement

Exchange rate used: 105 RSD: 1 USD

Sector	Subsector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected timeframe	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Contribution to capacity- building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
				Domestic currency (RSD)	USD								
Cross-cutting		Further support for the establishment of a transparency framework in the Republic of Serbia (CBIT 2)	The aim of the project is to support the Republic of Serbia in establishing a national transparency framework in accordance with the provisions of the Paris Agreement	228,900,000	2,180,000	2025 -	GEF	Cross-cutting	0	1	1	The project is a continuation of the project implemented during the period 2019-2022 and directly contributes to strategic objectives in the field of climate change.	Beneficiary: MoEP Implementation: UNDP UNDP submitted a request for the second phase of the project. The application evaluation is in progress.
Cross-cutting		Continuation of Advancing Medium and Long-Term Adaptation Planning for Climate Change in the Republic of Serbia (NAP 2)	The aim of the project is to support the Republic of Serbia in monitoring the implementation of adaptation measures and actions.	94,500,000	900,000.00	2025 -	GEF	Adaptation	0	1	1	The project is a continuation of the project implemented during the period 2019-2023 and directly contributes to strategic objectives in the field of climate change.	Beneficiary: MAFWM and MoEP Implementation: UNDP UNDP submitted a request for the second phase of the project to GCF. The application evaluation is in progress.
Agriculture		Strengthening the resilience of small and medium-sized fruit and vegetable producers to climate change induced water insecurity in Central Serbia	The project is planned to implement Activity 3.1.2 from Action Plan of Climate Change Adaptation Program: Assessment of the capacities for using water from existing artificial reservoirs in Central Serbia for irrigation purposes	420,000,000.00	4,000,000.00	2025 -	GCF	Adaptation	0	1	1	The project results are expected to directly contribute to climate change adaptation	Beneficiary: MAFWM Implementation: UNDP Waiting for approval of the project.
Cross-cutting		ACTION PLAN of CLIMATE CHANGE ADAPTATION PROGRAM: Measure 1.2. Developing climate change adaptation research programme	Activity 1.2.1.: Preparing an analysis of the representation of scientific research projects financed by the Science Fund with a contribution to climate change adaptation (completed and ongoing) and identifying priority scientific topics contributing to climate change adaptation	600,000.00	5,714.00	by 2026	Grant	Adaptation	1	1	1	The research program in the field of adaptation to changed climatic conditions will contribute to climate change adaptation	The entity responsible for implementation of the activity: MoEP in cooperation with Science Fund, universities and other scientific institutions
Cross-cutting		ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 1.3. Integrating drought as a multidimensional climate hazard in the system for monitoring, timely alerts, and impact assessment, including damages and losses	Activity 1.3.1. Developing of a Methodology for Drought Monitoring of importance for all relevant sectors in the Republic of Serbia, taking into account all aspects of drought climate hazard and the time dimensions for which it is identified: from long-term to short-term.	2,950,000.00	28,095.00	By 2026	Grant	Adaptation	0	1	1	Methodology for Drought Monitoring as a multi-dimensional climate hazard will contribute to climate change adaptation	The entity responsible for implementation of the activity: MoEP in collaboration with RHMSS, MoI, MAFWM, SCC, universities and other scientific institutions

Sector	Subsector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected timeframe	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Contribution to capacity- building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
				Domestic currency (RSD)	USD								
Agriculture		ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 1.6. Capacity strengthening and awareness raising for adaptation of agricultural production to climate change	Activity 1.6.3. Developing zoning methodology for fruit production areas in conditions of climate change Activity 1.6.4. Developing zoning methodology for viticulture production areas in conditions of climate change	4,424,000.00	42,133.00	by 2026	Grant	Adaptation	0	1	1	Zoning methodologies for fruit and viticulture production areas in conditions of climate change will contribute to adaptation of agriculture on climate change.	The entity responsible for implementation of the activity: MAFWM in collaboration with MoEP, universities and other scientific institutions
Agriculture		ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 1.6. Capacity strengthening and awareness raising for adaptation of agricultural production to climate change	Activity 1.6.5. Conducting a study on suitability of growing conditions and risks for agricultural production in conditions of climate change Activity 1.6.6. Conducting a study on suitability of growing conditions and risks for livestock farming in conditions of climate change Both studies include spatial mapping of areas with favourable climate and areas under climate risks, with recommendations for climate change adaptation.	5,900,000.00	56,190.00	by 2026	Grant	Adaptation	0	1	1	Studies on suitability of growing conditions and risks for agricultural production and for livestock farming will contribute to adaptation of agriculture on climate change.	The entity responsible for implementation of the activity: MAFWM in collaboration with MoEP, universities and other scientific institutions
Agriculture		ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 1.7. Improvement of agrometeorological services to provide the necessary information for increasing the resilience of agricultural production to climate change	Activity 1.7.2. Improvement of the RHMSS agrometeorological monitoring system by increasing the number of meteorological and agrometeorological stations, stations for measuring soil moisture content, and hydrological stations for surface water and groundwater	28.700.000.00	273,333.00	by 2026	Grant	Adaptation	0	1	1	The newly installed agrometeorological stations, soil moisture measurement stations, and hydrological stations will contribute to climate change adaptation.	The entity responsible for implementation of the activity: RHMSS
Energy		ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 1.10. Assessment of the climate change impact on hydrological parameters relevant for planning in the energy sector	Activity 1.10.1. Developing climate change impact assessment methodology and preparing a study on the climate change impacts on the availability and condition of water resources for the energy sector purposes	4,424,000.00	42,133.00	by 2026	Grant	Adaptation	0	1	1	climate change impact assessment methodology and study on the climate change impacts on the availability and condition of water resources for the energy sector purposes will contribute to climate change adaptation.	The entity responsible for implementation of the activity: MoEP in collaboration with MoME, RHMSS, universities and other scientific institutions
Energy		ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 1.11. Assessment of the changes in the distribution regime of heating and cooling degree days under climate change and development of the monitoring and forecasting system for heating and cooling degree days, to improve planning of capacities for energy production	Activity 1.11.1. Developing the impact assessment methodology and preparing a study on the climate change impacts on the heating and cooling degree days distribution regime in the observed and future climate Conditions Activity 1.11.2. Developing the methodology for monitoring and forecast of heating and cooling degree days, including seasonal forecasts	5,898,000.00	56,172.00	by 2026	Grant	Adaptation	0	1	1	Study on the climate change impacts on the heating and cooling degree days distribution regime in the observed and future climate Conditions and methodology for monitoring and forecast of heating and cooling degree will improve energy production capacity planning and contribute to climate change adaptation.	The entity responsible for implementation of the activity: MOEP in collaboration with MoME, RHMSS, MCTI, universities and other scientific institutions

Sector	Subsector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected timeframe	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Contribution to capacity- building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
				Domestic currency (RSD)	USD								
Other (Health)		ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 1.12. Improving the prevention and monitoring of the climate change impact on human health	Activity 1.12.1. Developing a methodology for climate change assessment and vulnerability monitoring for the health sector, and particularly for the vulnerable populations with a proposal for climate change adaptation measures	1,475,000.00	14,048.00	by 2026	Grant	Adaptation	0	1	1	Methodology for climate change assessment and vulnerability monitoring for the health sector on climate change conditions will contribute to climate change adaptation.	The entity responsible for implementation of the activity: MH in collaboration with MoEP, RHMSS, universities and other scientific institutions
Other (Biodiversity)		ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 1.13. Developing a methodology for monitoring the biodiversity status and climate vulnerability	Activity 1.13.1. Developing methodology for status monitoring and vulnerability assessment of species, habitats and ecosystems, with proposed climate change adaptation measures	2,212,000.00	21,067.00	by 2026	Grant	Adaptation	0	1	1	Methodology for status monitoring and vulnerability assessment of species, habitats and ecosystems, with proposed climate change adaptation measures	The entity responsible for implementation of the activity: MoEP in collaboration with SEPA, The Institute for Nature Conservation of Serbia, Provincial Institute for Nature Conservation
Agriculture		ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 3.1. Optimizing irrigation in line with needs and resources	Activity 3.1.1 Preparing assessment of needs for artificial water reservoirs and atmospheric water reception and storage capacities (including micro-reservoirs) to assess the possibility for reservoirs construction and costs, for agricultural crop irrigation purposes	6,000,000.00	57,143.00	by 2026	Grant	Adaptation	0	1	1	Study on needs for artificial water reservoirs and atmospheric water reception and storage capacities will contribute to climate change adaptation.	The entity responsible for implementation of the activity: MAFWM in collaboration with MoEP, universities and other scientific institutions
Transport		ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 3.2. Road infrastructure climate vulnerability and risk assessment	Activity 3.2.1 Developing methodology for climate change vulnerability and risk assessment for road infrastructure, with the possibility of vulnerability and risk levels spatial distribution mapping	15,000,000.00	142,857.00	by 2026	Grant	Adaptation	0	1	1	Methodology for climate change vulnerability and risk assessment for road infrastructure	The entity responsible for implementation of the activity: PU Putevi Srbije, MCTI in collaboration with RHMSS, MoEP, universities and other scientific institutions
Cross-cutting		NECP MP_D2: Monitoring the implementation of the Low Carbon Development Strategy of the Republic of Serbia for the period 2023-2030, with projections until 2050, and the Program for Adaptation to Changed Climate Conditions for the period 2023 to 2030	Facilitate the process of monitoring and revision of the adopted Low-Carbon Development Strategy as well as implementation of Program of adaptation to changed climate conditions with Action Plan.	168,000,000.00	1,600,000.00	2023-2030	Grant	Cross-cutting	0	1	1	Reducing GHG emissions and increasing resilience to climate change. Contribution to the objective of reduction of GHG emissions by 33.3% (without LULUCF) by 2030 compared to 1990 levels.	The entity responsible for implementation of the activity: MoEP
Industry		NECP MP_D5: Implementation of best available technologies in production processes in specific industries	Modernization of industrial process technologies and increased material efficiency for the prevention of pollutants in air, water, soil with application of best available technologies (BAT) in accordance with BREF documents for specific areas of industrial production.	3,480,000,000.00	33,142,857.00	2024-2030	Grant	Mitigation	1	1	1	Contribution to the objective of reduction of GHG emissions by 33.3% (without LULUCF) by 2030 compared to 1990 levels through non-energy related GHG emission reductions by the modernization of industrial process technologies.	The entity responsible for implementation of the activity: MoEP, Ministry of Finance
Industry		NECP MP_D5.1: Measures for the reduction of emissions of fluorinated gases with greenhouse effect in the refrigeration and air conditioning equipment	Indicative measures include: Reduction of the consumption of fluorinated gases with greenhouse effect (HFC) in accordance with the established deadlines and obligations according to the ratified Kigali amendment Implementation and improvement of established system for training and certification of refrigeration and air-conditioning repair technicians.	Estimated implementation costs are unknown	Estimated implementation costs are unknown	2024-2030	Grant	Mitigation	1	1	1	Contribution to the objective of reduction of GHG emissions by 33.3% (without LULUCF) by 2030 compared to 1990 levels	The entity responsible for implementation of the activity: MoEP

Sector	Subsector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected timeframe	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Contribution to capacity- building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
				Domestic currency (RSD)	USD								
Forestry		NECP MP_D7. Sustainable forest management (forest land, remaining forest land)	The measure aims to reverse the loss of forest cover through sustainable forest management, including a ban on the cutting down of forest for the first level of protection and limited for the second level in sustainable and strictly controlled manner, protection, restoration, afforestation and reforestation and increase efforts to prevent forest degradation, convert coppice forests to tall forests, control invasive species and afforestation with autochthonous species, restoration of moist habitats of lowland forests and expansion of riparian zones along watercourses	42,480,000,000.00	404,571,429.00	2024-2030	Grant	Cross-cutting	0	1	1	The reverse the loss of forest cover through sustainable forest management will contribute to the objective of reduction of GHG emissions by 40.3% (with LULUCF) by 2030 compared to 1990 levels	The entity responsible for implementation of the activity: MAFWM, research institutes, organizations responsible for forest management, private forest owners
Agriculture		NECP MP_D8: Waste lands conversion to croplands	The measure will facilitate conversion of non-irrigated lands on inclined terrains into perennial grassland, which will significantly decrease intensity of soil organic matter depletion and emission of soil carbon and will lead to carbon sink. Its implementation should be supported by incentives, especially in the first years of conversion, to enable farmers to convert these waste lands into arable land.	1,020,000,000.00	9,714,286.00	2024-2030	Grant	Mitigation	0	1	1	Contribution to the objective of reduction of GHG emissions by 40.3% (without LULUCF) by 2030 compared to 1990 levels	The entity responsible for implementation of the activity: MAFWM
Forestry		NECP MP_D9: Increase the tree-planted areas (groves / parks / green roofs, sanitary protection zones around mines and industrial buildings, wind protection belts and green zones next to highways)	This Investment and reform measure envisage numerous initiatives and information campaigns for citizens, explaining the environmental benefits in terms of the reduction of CO2 emissions, as well as through the provision of financial incentives. A potential provision of legal obligations for investors will be explored in order to regenerate green areas as well as the construction of sanitary and wind protection zones around mines, industrial facilities that are significant emitters of waste gases, along highways and traffic roads.	780,000,000.00	7,428,571.00	2024-2030	Grant	Cross-cutting	0	1	1	Contribution to climate change adaptation and emission reduction.	The entity responsible for implementation of the activity: MoEP, MAFWM, MCTI
Agriculture		NECP MP_D10: Measures for the reduction of CH4 emissions from the enteric fermentation of animals	Measure will facilitate the reduction of CH4 emissions through the modification of the feed composition and nutrition practice in livestock through practical training and demonstration for farmers.	60,000,000.00	571,429.00	2024-2030	Grant	Mitigation	1	1	1	CH4 emissions reduction will contribute to the objective of reduction of GHG emissions by 40.3% (with LULUCF) by 2030 compared to 1990 levels	The entity responsible for implementation of the activity: MAFWM, Directorate for Agrarian payments, Veterinary Directorate, Chamber of Commerce and Industry, research institutes
Agriculture		NECP MP_D11: Improvement of manure management for the reduction of CH4 and N2O emissions	Facilitate the reduction of both CH4 and indirect nitrous oxide (N2O) emissions through the improvement of manure management by anaerobic digestion	1,080,000,000.00	10,285,714.00	2024-2030	Grant	Mitigation	1	1	1	Reduction of CH4 and nitrous oxide (N2O) emissions will contribute to the objective of reduction of GHG emissions by 40.3% (with LULUCF) by 2030 compared to 1990 levels.	The entity responsible for implementation of the activity: MAFWM, Directorate for Agrarian payments, Agricultural Land Directorate, Farmers Research institutes

Sector	Subsector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected timeframe	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Contribution to capacity- building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
				Domestic currency (RSD)	USD								
Agriculture		NECP MP_D12: Measures for the reduction of direct and indirect N2O emissions from managed soils	Facilitate the N2O emission reduction from managed soils through the following indicative ways: • Using less nitrogen fertiliser. • Using split applications of nitrogen fertilisers • Using legume crops or pastures in the rotation instead of nitrogen fertiliser. • Using minimum tillage for cropping. • Preventing waterlogging • Using nitrification inhibitors.	720,000,000.00	6,857,143	2024-2030	Grant	Mitigation	1	1	1	N2O emission reduction will contribute to the objective of reduction of GHG emissions by 40.3% (with LULUCF) by 2030 compared to 1990 levels	The entity responsible for implementation of the activity: MAFWM, Directorate for Agrarian payments, Agricultural Land Directorate, Farmers Research institutes
Agriculture		NECP MP_D13: Measures for reducing emissions from fertilizers use	Facilitate the reduction of ammonia and nitrous oxide emissions resulting from the use of fertilizers through the application of new technologies.	3,360,000,000.00	32,000,000.00	2024-2030	Grant	Mitigation	1	1	1	Reduction of ammonia and nitrous oxide emissions resulting from the use of fertilizers will contribute to the objective of reduction of GHG emissions by 40.3% (with LULUCF) by 2030 compared to 1990 levels.	The entity responsible for implementation of the activity: MAFWM, Agricultural Advisory Service, Directorate for Agrarian payments, Agricultural Land Directorate, Chamber of Commerce and Industry, farmers
Energy		NECP MP_D21 Supporting electricity production from renewable stations that will not participate into the auctions including the deployment of renewables power purchase agreements	Investment and regulatory measures will foresee the provision of operational aid primarily for small scale-decentralized RES systems. The support will be designed taking into consideration the potential benefits to the electricity grids, due to the avoided investments for the adaptation, enhancement and expansion of the grid networks, and supporting households as micro-investors. Indicative budget include investment measure: NECP MP_D22: Provision of economic support to innovative and demonstration pilot RES projects, such as installation of floating photovoltaics power plants and vertical wind turbines, the promotion of small wind turbines, the construction of concentrated solar power plants and the development of enhanced geothermal systems. Also, Indicative budget include investment measure: NECP MP_D26: Fostering the self-consumption of the produced electricity, for the installation of decentralized renewable energy systems as well as measure: NECP MP_D36 Promotion of RES communities (incentives will be provided so as to foster the further deployment of renewable energy sources, such as wind parks and photovoltaic stations).	84,000,000,000.00	800,000,000.00	2025-2030	Grant	Mitigation	1	1	1	Increase share of RES in electricity production The promoted renewable energy technologies will also lead to primary energy savings, contributing to the achievement of relevant goals The implementation of renewable energy technologies will reduce dependence on energy imports and increase the use of domestic energy sources.	The entity responsible for implementation of the activity: MoME and Ministry of Finance

Sector	Subsector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected timeframe	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Contribution to capacity- building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
				Domestic currency (RSD)	USD								
Energy		NECP MP_Д31 Facilitating the penetration of RES into district heating networks	Investment measure will support the further penetration of renewable energy technologies into the existing and planned district heating networks by providing specific economic incentives. Moreover, the potential imposition of a mandatory quota in the utilization of renewable energy sources as fuel in the district heating networks will be scrutinized. Finally, the initiation of modern low-temperature district heating systems will be examined, connecting local demand with all renewable and waste energy sources, as well as the wider electric and gas grid. The utilization of centralised heat pumps as pilot projects will be explored, also under the prerequisite that their investment cost will be decreased	6,240,000,000.00	59,428,571.00	2025-2030	Grant	Mitigation	1	0	1	2,65 ktoe of biomass 19,06 ktoe of solar energy An increasing share of RES in heating and cooling will lead to primary energy savings, contributing to the achievement of relevant goals. The implementation of renewable energy technologies will reduce dependence on energy imports and increase the use of domestic energy sources.	The entity responsible for implementation of the activity: MoME and LSG units
Transport		NECP MP_D32 Fostering the production of advanced biofuels for use in transport sector	Investment merasue will foster the production of domestic biofuels according to the requirements of the Directive 2018/2001/EU through the provision of subsidies and fiscal incentives.	12,000,000,000.00	114,285,714.00	2025-2030	Grant	Mitigation	1	0	1	Increase share of RES in transport: 49 ktoe of biofuels without the effect of multipliers (58 million lt of biofuels). The foreseen biofuels consist of both imported biodiesel and bioethanol and domestically produced biodiesel and bioethanol.	The entity responsible for implementation of the activity: MoME
Transport		NECP MP_D33 Fostering the consumption of biofuels in transport sector	This measure will promote the further consumption of biofuels through the imposition of mandatory quota for the suppliers and blending thresholds for the case of biodiesel and bio gasoline taking into consideration the minimum technical limits, which can be considered as acceptable for the current vehicle stock. The cultivation of fast-growing energy plants for the production of biofuels, which can be used in transport sector, will be explored. Indicative budget include measure: MP_D40 Development of effective supply chains for the exploitation of the available potential of biofuels, bioliquids and biomass, that plans to provide economic support for equipment and infrastructure in supply stages, such as production, processing, transportation, and biomass storage. Moreover, the potential imposition for collecting the biomass in the form of gate-fee levy will be examined in order to increase the quantities of biomass, which will be utilized for energy production. The compliant biofuels, bioliquids and biomass fuels with the sustainability and greenhouse gas emissions saving criteria will be supported, as foreseen by the Directive 2018/2001/EU.	60,000,000.00	571,429.00	2025-2030	Grant	Mitigation	1	1	1	Increase share of RES in transport The implementation of renewable energy technologies will reduce dependence on energy imports and increase the use of domestic energy sources.	The entity responsible for implementation of the activity: MoME including MAFWM for measure MP_D40.

Sector	Subsector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected timeframe	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Contribution to capacity- building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
				Domestic currency (RSD)	USD								
Transport		NECP MP_D34 Development of the required infrastructure for recharging electric vehicles	Investment and regulatory measures will facilitate the adoption of the legislative framework for the promotion of electromobility. Moreover, the design and deployment of the required infrastructure for charging electric vehicles will be carried out with the provision of economic support for the installation of public chargers. Potential incentives will be explored to boost the consumption of RES in electromobility during the deployment of the required recharging infrastructure. The cost of this measure refers only to the installation of chargers and not to the possible needs for strengthening the distribution network in order to accommodate these chargers.	10,200,000,000.00	97,142,857.00	2025-2030	Grant	Mitigation	0	1	1	6,8 thousand installed public chargers. The promoted electric vehicles will also lead to savings in final and primary energy, contributing to the achievement of relevant goals. The implementation of renewable energy technologies will reduce dependence on energy imports and increase the use of domestic energy sources.	The entity responsible for implementation of the activity: MCTI
Cross-cutting		NECP MP_D38 Supporting demonstration projects for the promotion of biomethane and renewable hydrogen	Investment measure will finance the design and implementation of demonstration projects for the production and utilization of biomethane and renewable hydrogen so as to be consumed in all end-use sectors contributing to the meaningful reduction of their production cost and improving their technical feasibility in regard to Hydrogen and biomethane transportation with the existing natural gas network.	4,200,000,000.00	40,000,000.00	2025-2030	Grant	Mitigation	1	1	1	87 ктое of biomethane Increase share of RES in electricity, increase share of RES in heating and cooling and increase share of RES in transport, thereby contributing to the expected share of biofuels, bioliquids, and biomass.	The entity responsible for implementation of the activity: MoME
Cross-cutting		NECP MP_D39 Development of the required legislative framework and the required infrastructure for the deployment of biomethane and renewable hydrogen	This measure envisages the adoption of the legislative framework (e.g., licensing, technical guidelines) and facilitation of the deployment of the required infrastructure for allowing the use and consumption of biomethane and renewable hydrogen in the end-use sectors. The construction of dedicated infrastructures for large-scale storage and transportation of pure hydrogen, going beyond point-to-point pipelines within industrial clusters, will be explored	96,000,000.00	914,286.00	2025-2030	Grant	Mitigation	0	1	1	Increase share of RES in electricity, in heating and cooling and in transport, thereby contributing to the expected share of biofuels, bioliquids, and biomass.	The entity responsible for implementation of the activity: MoME
Cross-cutting		NECP MP_Д42 Carrying out information and training activities to all to all relevant actors for the use of RES	This reform measure will promote the implementation of information, training programmes to inform citizens of how to exercise their rights as active customers, and of the benefits and practicalities of using RES, including producing energy for self-consumption. Guidelines will be available to all relevant actors focusing on planners and architects, to consider the optimal usage RES in planning and construction. Emphasis will be places on improving the social acceptance of the renewable energy sources for electricity production.	24,000,000.00	228,571.00	2025-2030	Grant	Mitigation	0	1	1	Increase share of RES in electricity, in heating and cooling and in transport, thereby contributing to the savings in primary energy, contributing to the achievement of relevant goals. It will reduce dependence on energy imports and increase the use of domestic energy sources.	The entity responsible for implementation of the activity: MoME

Sector	Subsector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected timeframe	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Contribution to capacity- building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
				Domestic currency (RSD)	USD								
Energy		NECP MP_EE1 Financial support for energy rehabilitation of residential buildings	Investment measure will provide subsidies for the energy renovation of the existing residential buildings through the rehabilitation of the building envelope and technical systems attaining the optimum cost-effectiveness ratio and increasing the share of the own funds, which will be utilized. Emphasis will be given to the promotion of heat pumps through specialized actions. Additional financial and fiscal measures will be initiated in the case that the contribution of the planned subsidies is not sufficient. Indicative budget include measure: NECP MP_D30 Provision of fiscal and economic incentives to foster RES in heating and cooling, that will provide incentives for the cost-effective support of renewable energy technologies for heating and cooling according to the provisions of Articles 71 and 74 of the Law on the use of renewable energy sources. The active role of the local self-governments, which are also responsible for the implementation of incentive measures, will be enabled. Also, Indicative budget include measure: NECP MP_EE5 Financial support for the construction and energy renovation of buildings exceeding minimum energy requirements. The potential use of low-carbon construction materials will be examined facilitating the transformation of the buildings into zero-emission buildings for their whole life-cycle	205,320,000,000.00	1,955,428,571.00	2025-2030	Grant Concessional loan The possibility of applying the ESCO financing model	Cross-cutting	0	1	1	131 thousand energy-renovated residential buildings (final energy savings 35 ktoe) 14.3 million m2 of energy-renovated residential buildings 2 GWth new capacity of heat pumps (final energy savings 34 ktoe) The achieved energy savings will reduce the consumption of fossil fuels, leading to a decrease in GHG emissions and a reduction in dependence on energy imports. 1476 ktoe of biomass, 4 ktoe of geothermal energy, 25 ktoe of solar thermal energy and 145 ktoe of ambient heat. Increase share of RES in in heating and cooling and promoting RES technology thereby contributing to the savings in primary energy. Applying RES technology will reduce dependence on energy imports and increase the use of domestic energy sources.	The entity responsible for implementation of the activity: Ministry of Finance, MoME, EE Directorate, MCTI
Energy		NECP MP_EE2 Financial support for the energy renovation of public buildings	Investment measure will promote the energy renovation of public buildings. The most cost-effective interventions will be supported for the rehabilitation of the building envelope and technical systems attaining the optimum cost-effectiveness ratio as prioritized within the framework of the energy management systems, which will be developed by the responsible authorities in accordance with the Law on Energy Efficiency and Rational Use of Energy. The achievement of the target for the energy renovation of buildings owned and used by the central administration (central government buildings – CGB) of 3% annually will be achieved with the most cost-effective approach. Indicative budget include measure: NECP MP_EE5: Financial support for the construction and energy renovation of buildings exceeding minimum energy requirements. The potential use of low-carbon construction materials will be examined facilitating the transformation of the buildings into zero-emission buildings for their whole life-cycle	121,920,000,000.00	1,161,142,857.00	2025-2030	Grant The possibility of applying the ESCO financing model	Cross-cutting	0	1	1	1,206 thousand m2 energy-renovated public buildings (final energy savings 5 ktoe delivered by interventions in the building envelope). 1.3 GWth new capacity of heat pumps (final energy savings 27 ktoe) The achieved energy savings will reduce fossil fuel consumption, leading to a decrease in GHG emissions and a reduction in dependence on energy imports.	The entity responsible for implementation of the activity: Ministry of Finance, MoME, EE Directorate, MCTI, Ministry for Public Investments, Provincial Secretariat of Vojvodina for Energy, Construction and Transport ,

Sector	Subsector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected timeframe	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Contribution to capacity- building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
				Domestic currency (RSD)	USD								
Cross-cutting		NECP MP_EE3 Financial support for the energy renovation of non-residential buildings (not public)	Investment measure will foresee the provision of subsidies for the energy renovation of non-residential buildings, with the exemption of public buildings, emphasising on the reduction of the heating and cooling demand in the service sector. The design and provision of dedicated financial incentives will enable more extensive energy rehabilitation of non-residential buildings through cost-optimal interventions to improve the energy efficiency of buildings and technical systems with the highest potential for energy savings. Additional financial and fiscal measures will be initiated, such as the adoption of targeted tax deductions and the unhampered access to the required funds through credit lines, guarantees and soft-interest loans in the case that the contribution of the planned subsidies is not sufficient. Indicative budget include measure: NECP MP_EE5: Financial support for the construction and energy renovation of buildings exceeding minimum energy requirements. The potential use of low-carbon construction materials will be examined facilitating the transformation of the buildings into zero-emission buildings for their whole life-cycle	192,120,000,000.00	1,829,714,286.00	2025-2030	Grant Concessional loan The possibility of applying the ESCO financing model.	Cross-cutting	0	1	1	7,681 thousand m2 energy-renovated non-residential buildings (final energy savings 32 ktoe delivered by interventions in the building envelope) 3.8 GWth new capacity of heat pumps (final energy savings 25 ktoe) The achieved energy savings will reduce fossil fuel consumption, leading to a decrease in GHG emissions and a reduction in dependence on energy imports.	The entity responsible for implementation of the activity: Ministry of Finance, MoME, EE Directorate, MCTI
Cross-cutting		NECP MP_EE6 Installation of solar thermal systems in new buildings and in buildings undergoing extensive energy renovation	Investment measure will facilitate the installation of solar thermal systems in new buildings and those undergoing major renovation, as defined in Directive 2010/31/EU, facilitating simultaneously the further deployment of renewable energy. The planned measure will also be used to combat energy poverty.	76,440,000,000.00	728,000,000.00	2027-2030	Grant	Cross-cutting	0	1	1	1.8 GW capacity of solar thermal systems (primary energy savings 41 ktoe) The achieved energy savings will reduce fossil fuel consumption, leading to a decrease in GHG emissions and a reduction in dependence on energy imports.	The entity responsible for implementation of the activity: MoME, EE Directorate,
Transport		NECP MP_EE12 Financing programs for the promotion of energy efficiency passenger vehicles	Investment measure will provide subsidies for the purchase of energy efficient passenger vehicles in order to replace conventional ones in the case that the fiscal measures are not sufficient for the fulfilment of the established targets. The provided subsidies will be considered as eligible the vehicles that consume alternative fuels. Indicative budget include investment measure: NECP MP_EE19: Development of sustainable regional or municipal mobility plans, that way leading to the completion of the holistic framework for the implementation of the above-mentioned measures at local and regional level, taking into consideration the local characteristics and the design elements from all the above-mentioned measures as well as the existing spatial planning requirements according to the legislative framework.	68,400,000,000.00	651,428,571.00	2025-2030	Grant	Mitigation	0	1	1	20.5 thousand electric vehicles (final energy savings 9 ktoe) The achieved energy savings will reduce fossil fuel consumption, leading to a decrease in GHG emissions and the promoted electric vehicles will increase the share of renewable energy sources in transport. The achieved energy savings will reduce fossil fuel consumption, leading to a decrease in GHG emissions and a reduction in dependence on energy imports.	The entity responsible for implementation of the activity: MoME and MoEP For measure EE19: The entity responsible for implementation of the activity: MoME and LSG units

Sector	Subsector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected timeframe	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Contribution to capacity- building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
				Domestic currency (RSD)	USD								
Transport		NECP MP_EE14 Promotion of energy efficiency of the freight transport	Investment measure will foster the promotion of energy efficiency of the freight transport with various initiatives, such as the replacement of the conventional light-duty and heavy-duty vehicles with new more energy efficient and the facilitation of the freight transport through specialized taxation measures. A specialized action plan will be prepared identifying the most effective activities, while special focus will be given on how the logistics sector will become more sustainable Indicative budget include investment measure: NECP MP_EE13: Development of the required infrastructure for the promotion of alternative fuels, in accordance with the provisions of Directive 2014/94/EU. Especially for the case of electromobility, an electrification action plan for passenger and freight transport, roads and infrastructure will be compiled, emphasizing also the development of the legal framework and the exploitation of various financial instruments. . Indicative budget includes reform measure: NECP MP_D35: Provision of fiscal and economic incentives to foster the further deployment of electric vehicles, focusing on energy-intensive categories, such as taxies, light-duty vehicles etc. The planned incentives will be distinguished for the acquisition and the operation of electric vehicles Indicative budget include investment measure: NECP MP_EE19: Development of sustainable regional or municipal mobility plans, leading to the completion of the holistic framework for the implementation of the above-mentioned measures at local and regional level, taking into consideration the local characteristics and the design elements from all the above-mentioned measures as well as the existing spatial planning requirements according to the legislative framework.	79,800,000,000.00	760,000,000.00	2025-2030	Grant	Mitigation	0	1	1	21.1 thousand electric LD vehicles (final energy savings 25 ktoe) Electric vehicles will lead to savings in final and primary energy, contributing to the achievement of relevant goals. The implementation of renewable energy technologies will reduce dependence on energy imports and increase the use of domestic energy sources.	The entity responsible for implementation of the activity: MoME MCTI, Ministry of Finance EE19: The entity responsible for implementation of the activity: MoME and LSG units

Sector	Subsector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected timeframe	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Contribution to capacity- building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
				Domestic currency (RSD)	USD								
Industry		NECP MP_EE21 Support schemes for the promotion of energy efficiency in the industrial sector	Investment measure will initiate a targeted support scheme for the implementation of energy efficiency projects in the industrial sector by combining various financial and fiscal instruments, such as direct financial support, low-interest loans, tax deductions, credit lines and guarantees The implementation measure is linked also with mandatory implementation of energy audits and development of energy management systems in order to identify the most cost-effective energy efficiency interventions which would enable economic support. Indicative budget include measure: NECP MP_EE22 Regulatory measures for the promotion of energy efficiency in the industrial sector, will facilitate the further deployment of the best available technologies in compliance with the respective legislation (Industrial Emission Directive), while the development of the appropriate monitoring and surveillance mechanism will be considered as a vital prerequisite for the implementation of the measure. Moreover, the application of the eco-design requirements will ensure the penetration of energy efficient technologies and equipment	403,920,000,000.00	3,846,857,143.00	2025-2030	Grant	Mitigation	1	1	1	The achieved energy savings will reduce fossil fuel consumption, leading to a decrease in GHG emissions. The achieved energy savings will reduce fossil fuel import and consumption, leading to reduction in dependence on energy imports.	The entity responsible for implementation of the activity: MoME Ministry of Economy, Ministry of Finance For measure EE22: The entity responsible for implementation of the activity: MoME and MoEP
Energy		NECP MP_EE34 Regulatory measures and financing programs for promoting/modernizing high efficient CHP units and district heating/cooling networks	Investment and reform measure will launch financial programs for the installation of new and the modernization of existing highly efficient CHP units and district heating/cooling networks. In the case of the new highly efficient CHP units, planned incentives will be carried out in alignment with the Law on Energy Efficiency and Rational Use of Energy. Emphasis will be placed on exploiting waste heat mainly by the industrial activities in the materialised highly efficient CHP units and district heating/cooling networks. The foreseen investments will be designed in conjunction with the respective one within the framework of PM_EE23	4,200,000,000.00	40,000,000.00	2025-2030	Grant	Mitigation	1	1	1	23 MW (Electricity output: 31 ktoe, Heat output for district heating: 6 ktoe, Industrial heat output: 13 ktoe)	The entity responsible for implementation of the activity: MoME, EE Directorate LSG units, Heating plants

Sector	Subsector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected timeframe	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Contribution to capacity- building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
				Domestic currency (RSD)	USD								
Energy		NECP MP_IEM9 Investments related to the digitalisation of the networks aiming at increasing RES integration and improvement of quality of supply	Investment measure refers to a policy- and financially-backed programme with the aim to promote smart grids and in particular prioritise the application of IEC 61850, the designation of sensing points and forecasting tools for demand and RES forecasting at mid and short-term time scales, the monitoring of quality of supply parameters (sags, swells, etc), as well as, the dynamic line rating for lines and cabling at important nodes to the system. These measures are expected to improve the observability of dynamic phenomena and improve the forecasting accuracy by the network operators. In addition, the measure envisages the installation of DLR and FACTS devices on the transmission network in parts that are considered to allow greater flexibility in the integration of renewable sources.	1,200,000,000.00	11,428,571.00	2026-2030	Grant	Mitigation	1	1	1	Increased system flexibility and quality of electricity supply, in particular through policies and measures related to market-based price formation in compliance with applicable law; market integration and coupling, aiming to increase the tradeable capacity of existing interconnectors, smart grids, aggregation, demand response, storage, distributed generation, mechanisms for dispatching, re-dispatching and curtailment and real-time price signals. This also includes the improvement of cybersecurity and resilience in the energy sector.	The entity responsible for implementation of the activity: MoME JSC "Elektromreza Srbije" Elektrodistribucija Srbije ltd. Belgrade

Table III.7

Information on financial support received by the Republic of Serbia under Article 9 of the Paris Agreement

Exchange rate used: 105 RSD: 1 USD

Title of activity, programme, project or other	Programme/ project description	*Channel*	Recipient entity	Implementing entity	Amount received *(climate-specific)*		Time Frame	Financial Instrument	Status	Type of Support	Sector	Sub-Sector	Contribution to technology development and transfer objectives	Contribution to capacity- building Objectives	Status of activity	Use, impact and estimated results	Additional Information
					Domestic currency (RSD)	USD											
Removing Barriers to Promote and Support the Energy Management System in Municipalities in Serbia (EMIS 1)	To increase investments in energy efficiency in public buildings and utility services within the competences of municipalities in order to improve their energy and cost efficiency through: • Development of legal, regulatory and institutional framework related to energy efficiency • Co-financing of at least 10 demonstration energy efficiency projects in public buildings / utility services on the basis of public call to units of LSG • Raising public awareness regarding energy efficiency	GEF and UNDP	MoME	UNDP	262,500,000.00	2,500,000.00	2015-2021	Grant	Received	Mitigation	Energy		1	1	Completed	It is expected that this intervention will lead to a reduction in energy consumption and CO2 emissions	
Contribution of Sustainable Forest Management to a Low Emission and Resilient Development	Contribute to the conservation of biodiversity and climate change mitigation through the promotion of multifunctional sustainable forest management in productive forest landscapes through the following: Improved decision making in management of productive forest landscapes Institutional capacities strengthened for multifunctional forest management Increased forest area under sustainable and multifunctional forest management Adaptive management ensured and key lessons shared	GEF and UN FAO	MAFWM	FAO	376,503,750.00	3,585,750.00	2017-2020	Grant	Received	Mitigation	Forestry		0	1	Completed	CCM consideration reflected in sectoral documents and action plans, as well as forest development and forest management plans under implementation. Strong standardized measurements processes established and implemented through NFI; reporting is widely available in multiple formats, improved capacities of forest managers and institutions; State Forests (PE Srbjasume/Voivodinasume, National Parks Tara and Fruska Gora): 18,000 ha; Church Forests and Private Forests: 2,000 ha; Total: 20,000 ha in addition to baseline.	

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Second Biennial Update Report and Third National Communication under the UNFCCC	Support the Government of the Republic of Serbia to prepare its Second Biennial Update Report and Third National Communication under the UNFCCC	GEF	MoEP	UNDP	98,910,000.00	942,000.00	2017-2022	Grant	Received	Cross- cutting	Cross-cutting		0	1	Completed	Second Biennial Update Report and Third National Communication under the UNFCCC	
Energy Efficiency in Public Buildings - Education Facilities: Extended TA Support for the Implementation and Management of the Project	The funds will be used to identify necessary civil works rehabilitation measures that need to be implemented prior to the EE measures, elaborate demand-based energy audits of schools ("Energy Audits"), propose the selection of schools according to agreed criteria, define additional measures to improve the learning environment of the pupils, define adequate packages of rehabilitation measures ("Investment Plans"); elaborate technical design documents (final design and design review), prepare tender documents and guide the tender procedures for supply and works contracts; supervise construction works and final acceptance, and organise and implement capacity development programme for school and municipal staff responsible for the operation and maintenance of technical equipment.	KfW	Ministry of Education		94,080,000.00	896,000.00	2017 -2027	Grant	Received	Mitigation	Energy		0	1	Ongoing	It is expected that this intervention will lead to a reduction in energy consumption and CO2 emissions for at least 20%, increased comfort of building usage, and better learning and teaching conditions.	
Climate Smart Urban Development Challenge	The objective of this project to identify and promote climate-smart solutions for mitigating climate change at the local level in the Republic of Serbia. To do so, the Project formulates Challenges for identification and support of different ICT, technological solutions and business ideas that can be applied at the level of local self-governments to increase the share of "climate proof" public services. A call for ideas was open for local self-governments, business sector, research and scientific community, CSO etc.	GEF	MoEP	UNDP	365,227,380.00	3,478,356.00	2017-2023	Grant	Received	Cross- cutting	Cross-cutting		1	1	Completed	Enhancing capacities for combating climate change and managing natural resources. Communities are more resilient to the impacts of natural disasters and human-induced catastrophes.	

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Enhancing Environmental Performance and Climate Proofing of Infrastructure Investments in the Western Balkan Region from an EU integration perspective (ClimaProof)	The long-term objective of ClimaProof was to contribute to the reduction of climate change risks in the Western Balkan (WB) region while raising awareness, strengthening capacities and creating an enabling environment for investment in green infrastructure. The project aimed to improve the technical capacities of the Western Balkans (WB) in climate proofing their investments in the road infrastructure while developing national and international frameworks through integration of EU best practices.	Austrian Development Agency (ADC)	MoEP MCTI Republic Hydrometeorological Service of Serbia (Regional project)	UNEP	199,738,875.00	1,902,275.00	2017-2021	Grant	Received	Adaptation	Cross-cutting		0	1	Completed	Key project results include 1) high resolution, localised, bias corrected scenarios for the whole target region with an easy to handle program for bias correction, 2) strengthened national capacities to integrate climate change projections, climate proofing and green infrastructure in infrastructure development on a national and regional level and 3) Regional strategy for climate resilient infrastructure development, followed with an action plan identifying concrete climate proofing measures, including green infrastructure.	
Developing the capacities of Serbia for an effective engagement with the Green Climate Fund (GCF)	The goal of the project was to assess the national capacities for the verification and approval of projects that would apply for funding from the GCF The project focused on (i): Strengthening country capacities in relation to the GCF, (ii) Engaging stakeholders in consultative processes and (iii) Realizing direct access.	GCF	MAFWM	UNEP	31,500,000.00	300,000.00	2018-2020	Grant	Received	Cross- cutting	Cross-cutting		0	1	Completed	As part of this project, the National Program of the Republic of Serbia for the Green Climate Fund until 2025 was developed, which defines the national project and program priorities for financing from the GCF funds.	
Development of the Biomass market in the Republic of Serbia (Component 1)	The program aims to introduce the use of renewable energy sources in selected heating plants in the Republic of Serbia for the production of thermal energy, transitioning from the use of fossil fuels to the use of biomass (wood chips) and geothermal energy sources.	SECO, Government of Germany and KfW bank	District heating plants	MoME	3,142,949,747.70	29,932,855 Grant amount SECO 4.750.000 EUR; Grant of Gov of Germany 2.000.000 EUR; Concessional loan KfW bank 20.000.000 EUR with 1,1% Annual interest rate	2018-2024	Concessional loan and Grant	Received	Mitigation	Energy		1	1	Completed	The investment resulted in a reduction of CO2 emissions by 88% and SO2 emissions by 99%. The share of renewable energy sources in the total fuel consumption reached 90%.	With the support of the program, four biomass heating plants were built in the cities of: Priboj, Mali Zvornik, Novi Pazar, and Majdanpek.

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Regional Energy Efficiency Programme for the Western Balkans (REEP Plus)	The program blends policy support with loans, technical assistance and incentives to support energy efficiency and renewable energy investments in the public and private sectors in the Western Balkans.	EU, Austrian Federal Ministry of Finance And European Western Balkans Joint Fund (EWBJF) under the Western Balkans Investment Framework (WBIF)	Public and private sector in wester Balkan counties including Serbia	EBRD in close collaboration with the Energy Community Secretariat.	25,474,929,480.00	Total: 242,618,376.00 Loan: 207,012,266.00 Grant: 35,606,110.00	2018 -	Grant and loans	Received	Mitigation	Energy		0	0	Ongoing	Since its inception, the integrated package offered through REEP has reached 1,000 SMEs, 16,000 households and 399 public buildings across over 700 cities and towns. Related investments translate into 964,000 MWh/year energy saved, 540,000 tCO2/year emissions avoided, and 121 MW renewable energy capacity installed.	New Green Economy Financing Facility (GEFF) in Serbia that will provide loans to households for energy efficiency improvements. UniCredit and Erste Bank have signed up as the first two local partner financial institutions, with credit lines of Din 600 million (equivalent to €5.1 million) each for on-lending to homeowners. Serbian residents will be able to take out loans from these partner financial institutions specifically for green technology solutions for their homes such as new double-glazed windows, high-efficiency boilers or thermal insulation.
Establishment of Transparency Framework for the Republic of Serbia (the CBIT)	The goal of the project is to support the Republic of Serbia in establishing a national transparency framework in accordance with the provisions of the Paris Agreement. The main goal is finalization and launching of a monitoring, reporting, and verification (MRV) system for the collection of information relevant to climate change, in line with the Climate Change Law, that could provide more accurate information and analysis of the instruments that the country selects to mitigate and adapt to climate change.	GEF Government of Austria UNDP	MoEP	UNDP	152,700,030.00	1,454,286.00	2019-2022	Grant	Received	Cross- cutting	Cross-cutting		0	1	Completed	3 Action Plans for Climate Change Adaptation for Kraljevo, Ub, and Zrenjanin Improved quality of the GHG inventory; NDC revised; The project ensured Serbia's participation in the global initiative „Climate Promise"; A system for monitoring, reporting, and verification (MRV) in the field of climate change has been established, including an MRV-IT tool that supports higher-quality and more timely reports to the UNFCCC, as well as better and more active involvement of all institutions in tracking and reporting on the NDC.	

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Advancing medium and long-term adaptation planning in the Republic of Serbia	The specific objectives of the project included identifying the vulnerability of sectors and adaptation options to changing climate conditions, as well as the systematic collection of data and information relevant for assessing the situation and monitoring the implementation of adaptation measures and actions.	*GCF -Green climate fund*	MAFWM and MoEP	UNDP	203,225,820.00	1,935,484.00	2019 - 2023	Grant	Received	Adaptation	Cross-cutting		0	1	Completed	Within this project, a sectoral analysis of the impacts of climate change, a National Adaptation Program to changing climate conditions, and a Digital Climate Atlas were developed.	
TRATOLOW (Transition towards low emissions and climate-resilient economy in the Western Balkans and Türkiye)	Overall objective is to contribute to climate change mitigation and adaptation and the development towards a resource-efficient, low emissions and climate-resilient economy in the Western Balkans and Türkiye.	Regional: EU funded	MoEP and MoME	Umweltbundesamt and NIRAS			2020-2024	Grant	Received	Cross- cutting			0	1	Ongoing	To support the beneficiaries to develop their capacities for the implementation of the 2015 Paris Agreement, the transition to low-emission and climate resilient economies and to enhance the regional exchange of information, best practices, peer reviews, experience and awareness-raising campaigns.	
Strengthening Serbia's capacities for strategic engagement of private sector into climate financing	The goal of the project was to improve the tool/instrument, specifically the matrix for assessing and prioritizing project proposals and project ideas for financing from the Green Climate Fund (GCF), as well as for their inclusion in the National Program. Additionally, the aim was to recognize the importance and benefits of private sector investments in combating climate change and to establish direct cooperation with the GCF (currently only possible through international accredited agencies) to make both state and private sector investments more significant and sustainable.	*GCF*	MAFWM	FAO	58,837,485.00	560,357.00	2020-2022	Grant	Received	Cross- cutting	Cross-cutting		0	1	Completed		

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European Union for Civil Protection and Disaster Resilience Strengthening in the Republic of Serbia	To contribute to reducing vulnerability to disasters and to increase the country's resilience to climate change. Focus is on the following: • Improving capacities at the national and local level for preparedness and response in case of accidents and disasters through upgrading infrastructural and human capacities, • Improving the institutional coordination at the horizontal and vertical level, upgrading technical and operational capacities, • Contributing to advanced cooperation across sectors and enabling a faster, better coordinated and more effective response to natural and man-made disasters.	EU		UNDP	1,973,103,615.00	18,791,463.00	2020-2024		Received	Adaptation	Cross-cutting		0	1	Ongoing	Infrastructural upgrades Procurement of the equipment Capacity building activities	
Strengthening Disaster Resilience in Agriculture	Expected results of the project are: • Institutional and capacity gap assessment in the Ministry of Agriculture, Forestry and Water Management in Disaster Risk Reduction/Management and Climate Smart Agriculture • Support for agricultural expert services in disaster risk reduction and climate-resilient agriculture • Support for the agricultural education system in the field of climate change • Establishment of demonstration fields for the application of climate-resilient agriculture principles • Training for farmers in disaster risk reduction and climate-resilient agriculture	EU	MAFWM	FAO	292,818,663.90	2,788,749.18	2020-2026		Received	Adaptation	Agriculture		1	1	Ongoing	It is of great importance for adaptation to climate change.	Implemented entity: MAFWM, Agricultural Advisory Service
Rehabilitation of the district heating system in Serbia – Phase V	Rehabilitation of the district heating system in Belgrade, Bor, Jagodina, Leskovac, Negotin, Niš, and Senta. Goal: Increase energy efficiency and reduce harmful gas emissions.	Government of Germany through KfW	Direct borrowing of the Republic of Serbia – the right to use transferred to the participating heating plants.	MoME	3,759,790,352.85	Total 35,807,527 Loan: 33,569,557 Grant: 2,237,970	2020-2026	Concessional loan and Grant	Received	Mitigation	Energy		1	1	Ongoing	Estimated results: A 15% increase in energy efficiency in the rehabilitated parts of the system, and a reduction in CO2 emissions by 70,000 tons per year.	

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Energy efficiency in public buildings and renewable energy sources in the district heating sector ("Greening the public sector") - Renovation of the VMA hospital, Phase 1A	The project for the rehabilitation of the Military Medical Academy (VMA) includes the implementation of energy efficiency measures on the building's thermal envelope, technical systems for air conditioning, heating, and cooling, as well as the preparation of sanitary hot water using renewable energy sources. It also includes measures aimed at improving the functionality of the hospital.	KfW and EU WBIF	MoME	PMO Consultant– M4H Gmbh – Frankfurt, Federal Republic of Germany, and the Project Implementation Unit. (members MoME, Ministry of Defense and VMA)	587,467,242.60	5,594,926.12	2020 –2028	Grant	Received	Mitigation	Energy		1	1	Ongoing	It is expected that this intervention will lead to a reduction in energy consumption and CO2 emissions	
Green Transition – Implementing Industrial Emissions Directive in Serbia 2021-2025	To produce Directive Specific Implementation Plan for the implementation of the EU ETS Directive as well as analysis of the alignment of national legislation with EU ETS Directive and administrative plan for the full transposition of the Directive	SIDA	MoEP	TMF	259,253,505.00	2,469,081.00	2021-2026	Grant	Received	Mitigation	Cross-cutting		0	1	Ongoing	Directive Specific Implementation Plan for the implementation of the EU ETS Directive will contribute more efficient mobilization of funds for combating climate change.	
Green Agenda for Serbia	To contribute to the efficient, inclusive and sustainable implementation of the Green Agenda in Serbia by: improving the strategic and legislative framework, co-financing implementation of innovative pilot projects and mobilizing additional financing for scale-up investments. In this way, the project will contribute to the green transformation of economy and society in Serbia.	EU - IPA 2020 Embassy of Sweden EIB with additional funding from the Governments of Sweden, Switzerland and Serbia	MoEP	UNDP	540,474,480.00	5,147,376.00	2021-2024	Grant	Received	Cross- cutting	Cross-cutting		1	1	Ongoing	1. Support to MEP on establishment of MRVA in Serbia in accordance with Law on Climate Change 2. Based on the legal framework for GHG emissions permitting requirements the activity will support capacity building for MEP and SEPA regarding implementation of the newly established permitting requirements. 3. Development of an IT system/software for issuance of GHG emission permits. 4. Capacity building of operators on their legal obligations on preparing proper GHG monitoring plans, GHG emission reports and to apply for the GHG Permit. socio-economic benefits and prepare for compliance. 5. Selection of up to 10 EU ETS operators and up to 10 public and private entities from non-ETS sectors and assisting them in identification of best technologies for lowering their carbon intensity	

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Cities and Climate Change Program	AFD is implementing a budgetary funding and technical supports to accompany and accelerate the implementation of the Serbian government's climate roadmap over the coming years, in coordination with the World Bank.	AFD	Republic of Serbia	/	5,874,672,405.00	55,949,261.00	2021-	Concessional loan	Received	Cross- cutting	Cross-cutting		0	1	Ongoing	The program will make a structural contribution to Serbia's low-carbon pathway through its action to unlock the adoption and implementation of climate legislation, which is a prerequisite for the effectiveness of all other change mechanisms: engagement of public actors, monitoring of greenhouse gas emissions, report preparation, and mobilization of climate finance.	
Improvement of forest management in Serbia as a contribution to climate change adaptation and mitigation	The purpose is to strengthen the capacities of the forestry sector in Serbia and so assist the Serbian partners to further harmonise regulations and implement obligations stemming from EU regulations and standards in forestry and related fields, including timber market, Forest Information System, subsidies, Natura 2000 nature protection network and use of wood and other forest products in the bioeconomy.	EU Funding – IPA	MAFWM	Twinning Project Consortium of Austria and Slovakia	117,493,425.00	1,118,985.00	2021 -2023	Grant	Received	Cross- cutting	Forestry		0	1	Completed	Policy and administrative capacities in the forestry sector of Serbia assessed and improved. The system of subsidies in the forestry sector assessed and improved. Timber trade system legislation harmonised with EU requirements. The project will contribute to climate change adaptation and mitigation in forestry, entirely in accordance with the European Green Deal.	
Energy Efficiency in Central Government Buildings	The project covers the improvement of energy efficiency in 26 out of a total of 56 central government buildings (CGS). These central government buildings will undergo energy renovations through the reconstruction of the thermal envelope (replacement of windows and installation of insulation), reconstruction of the heating system, reconstruction of the cooling and ventilation systems in buildings where they exist, and the installation of energy-efficient indoor lighting, resulting in an energy savings of approximately 30% in these buildings. To date, funding for the project has been secured through a loan of 40 million euros and a grant of 1.02 million euros.	CEB, WBiF, SIGA, SCA, UNDP through Resource Mobilization Facility (RMF) trust fund of Slovakia	MoME	UNDP	4,819,581,270.00	45,900,774	2021-2025	Grant and Loan	Received	Mitigation	Energy		1	1	Ongoing	A reduction in primary energy consumption by at least 30%, a reduction in CO2 emissions by approximately 20%, and savings of about 29% in energy operating costs. Additionally, the program is expected to improve working conditions and contribute to the protection and preservation of cultural heritage.	

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Improvement of the energy management system to increase investments in energy efficiency in public buildings in Serbia	Further development of the energy management system, particularly in areas related to energy audits and the training system for energy advisors, as support for the implementation of the Energy Efficiency and Rational Use of Energy Act through: Improving energy efficiency and promoting the use of renewable energy sources in public buildings, with a special focus on buildings owned by the state. Supporting the incentive framework for policy and building local capacities for conducting energy audits. Contributing to the adoption of the Energy Management Information System (EMIS). Energy management in at least 80 new state-owned buildings. Supporting the renovation to improve energy efficiency in at least 28 buildings.	GEF/ UNDP	MoME	MoME	158,025,000.00	Total: 1,505,000.00 GEF 1.405.000 USD UNDP 100.000 USD	2021-2026	Grant	Received	Mitigation	Energy		0	1	Ongoing	It is expected that this intervention will lead to a reduction in energy consumption and CO2 emissions, around 145,000 tons CO_{2eq} during the 25-year lifecycle of the investment.	
Enabling environment at policy, field and market levels for Forest Landscape Restoration (FLR) to achieve Land Degradation Neutrality (LDN) in Serbia	The goal of the project is to promote and implement good practices for forest restoration and stopping soil degradation in Serbia. Outcomes of the project: Enhanced capacity in FLR planning and implementation to achieve LDN FLR approaches selected for upscaling Monitoring and dissemination of lessons learned to support scaling up of FLR to the national level	GEF	MAFWM	FAO	78,739,500.00	749,900.00	2022 -2025	Grant	Received	Cross- cutting	Forestry		0	1	Ongoing	Capacity of FLR/LDN related institutions for LDN incorporation into legal framework increased and strengthened FLR approaches with potential for upscaling in both pilot regions tested 35,715 ha of forest in Dmitrovgrad under FMP 1,392 ha of forests in Zrenanjin under FMP Project delivers expected results and shares lessons learned	

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Reducing the carbon footprint of local communities by applying the principles of the circular economy in the Republic of Serbia - Circular Communities	Project goal is Encouraging the development and supporting the implementation of circular ideas, business models and products of public and private companies, in order to reduce the carbon footprint of local communities in Serbia	GEF Republic of Sebia UNDP	MoEP	UNDP	305,922,225.00	2,913,545.00	2022 -2027	Grant	Received	Mitigation	Cross-cutting		1	1	Ongoing	Establish a supportive public policy and institutional framework aligned with EU circular economy policies, including training to improve the knowledge and skills of stakeholders, as well as encouraging broad community participation in the development and implementation of such policies; Establish a Low Carbon Communities Innovation Platform – LCCIP, in order to identify and support new business ideas, products, investments in the area of circular economy and efficient use of resources; Pilot investments in the area of circular economy; Spread knowledge and raise public awareness on the importance of circular economy.	

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Just Green Transition and Decarbonisation in Serbia	Project goal is Contributing to the achievement of Serbia's Nationally Determined Contribution (NDC) targets of 33,3% compared to 1990 level by 2030. Project focus Facilitation of wide consultation process and comprehensive dialogues with all relevant stakeholders for strategic planning and implementation of fair green transition, resulting in respective socio-economic analysis, conclusions and roadmap on just green transition Supporting concrete investments for green technology projects and innovative business models	Government of Japan Swiss Agy for Development & Cooperation State Secretariat for Eco Affairs Republic of Serbia	MoME and MoEP	UNDP	511,982,310	4,876,022.00	2022-2023	Grant	Received	Mitigation	Cross-cutting		1	1	Completed	Project helped to identify and use technologies and innovative business models in sectors most affected by decarbonization, while ensuring the principles of a just transition are incorporated into it. 12,563 t/CO2 emissions reduced in the 1st year of implementation of 8 supported projects, with prospects of reaching a cumulative level of 230,147.82 t/CO2e in a 20-year horizon. 7,8 MW of RES installed 25 new green jobs created 38 representatives of public and private companies trained in Accelerator for decarbonisation and just transition 15 representatives of business and institutional stakeholders trained for KAIZEN management methodology 110 beneficiaries (workers, representatives of vulnerable groups etc.) trained for new jobs	Through the Innovation Challenge Call, the project co-financed 8 projects that contribute to achieving Serbia's NDC target in reducing the greenhouse gas emissions (GHG) emissions with 600.000 USD (around 6% of total investment value) and mobilized additional investments for these projects from corporate sector of approx. 10 million USD
Innovative and Just Green Transition as Tool for Securing Systemic Energy Security and Reducing Energy Poverty	Ensuring energy security for all, reducing energy poverty in Serbia and contributing to achieving of the Nationally Determined Contribution (NDC) targets	Government of Japan Republic of Serbia	MoME and MoEP	UNDP	121,172,100.00	1,154,020.00	2023-2024	Grant	Received	Mitigation	Cross-cutting		1	1	Completed	Support to collectively respond to the climate emergency and establish resilient development pathways for sustaining human security and green transformation	Project focus was on Supporting innovative solutions that reduce import dependency, diversify energy sources, reduce energy intensity of the economy or enable access to clean and affordable energy for vulnerable population. and Improvements of legal and policy system on just green transition and energy poverty.

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Climate Proofing for Sustainable Development in the Western Balkans	The overall objective of this project is to establish a comprehensive knowledge and information base by development of a Western Balkan Climate-Proofing Platform (WB-CPP), tailored in terms of its content, featured methods, and tools provided and complementing other existing web-based platforms.	Austrian Development Agency (ADC)	MoEP Ministry of Toursim and Youth Protected Area managers	UNEP	232,660,291.50	2,215,812	2023 –2027	Grant	Received	Cross- cutting	Cross-cutting		0	1	Ongoing	Outcome I will provide general access to climate change knowledge, best practices and adaptation solutions by establishing a regional Western Balkans Climate-Proofing Platform (WB-CPP), which will be the key information base for evidence-based decision making. Outcome II will facilitate incorporation of climate considerations in planning and development processes through targeted stakeholder empowerment to apply climate-proofing principles and use the WB-CPP as well as piloting practical adaptation approaches in selected tourism destinations	
Partnership for Good Local Government	Program is to contribute to the development of decentralized public governance and accountable local governments which respect citizens' rights and provide sustainable services to all citizens. The quality and availability of local public services provided to the citizens and business by LSG will be improved in several areas of local-self-government competence: 1) administrative services; 2) economic development; 3) agriculture and rural development; 4) social development; 5) urbanism and spatial planning; 6) environmental protection; etc. The project improved Methodology for developing local adaptation plans to change climate conditions through a participatory process and intersectoral cooperation. Additionally, training was conducted to strengthen the capacity of Local Self-Governments (LSGs) for implementing climate change adaptation, including accredited training for LSG staff.	Swiss Government	MoEP and MCTI	SCTM and Swiss Agency for Development and Cooperation (SDC)	1,349,985.00	12,857.00	2023-2026		Received	Adaptation	Cross-cutting		0	1	Ongoing	The improved methodology for developing local adaptation plans to change climate conditions will contribute to increasing the resilience of urban areas to altered climate conditions by enhancing green infrastructure, in line with Measure 2.5 of the Action Plan of the Adaptation Program. Training for employees in LSGs has been conducted to increase capacity for adaptation to climate change, in accordance with Measure 3.3 of the Action Plan of the Adaptation Program (Supporting local government units in implementing climate change adaptation through strengthening green infrastructure).	

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					Domestic currency (RSD)	USD											
Clean energy and energy efficiency for citizens	The project will achieve energy savings through the implementation of energy rehabilitation of residential buildings, which will include the replacement of windows and doors, installation of insulation on roofs and walls, and replacement of heating systems, including the replacement of boilers and stoves, fuel change, and installation of solar collectors for heating sanitary hot water. The project will also promote the production of electricity from renewable energy sources by supporting the installation of solar panels in households.	World bank	MoME	MoME	5,275,455,838.80	50,242,437.56	2023-2027	Concessional loan	Received	Mitigation	Energy		1	1	Ongoing	This project is expected to lead to a reduction in energy consumption and CO2 emissions in the residential sector.	
Renewable District Energy Serbia - ReDE Serbia	The introduction of renewable energy sources (RES) into the district heating subsector will contribute to harnessing its vast potential in the process of decarbonizing Serbia. Phase 1 covers 14 investments in 10 cities across Serbia, through which renewable energy sources (mainly heat pumps, geothermal, and solar technologies) will be integrated into district heating systems. The program also includes institutional support from the EBRD. In this regard, it has been agreed between the Ministry of Mining and Energy (MOME) and EBRD that donor funds from EBRD will finance the development of several documents related to energy efficiency and the district heating subsector.	EBRD	MoME/LSG/ district heating plants	MoME	4,406,004,319.50	41,961,946.00	2024-2027	Concessional loan And Grant	Received	Mitigation	Energy		0	1	Ongoing	It is expected that this intervention will lead to an increase in the share of renewable energy sources in final energy consumption, a reduction in energy consumption, and a decrease in CO2 emissions.	
Energy renovation of residential, multi-family buildings connected to the district heating system – Public ESCO Project	The goal of the project is to improve energy efficiency in multi-family residential buildings connected to district heating systems and transition to billing based on heat energy consumption.	EBRD	MoME/LSG/ district heating plants / residential communities	MoME/LSG	7,578,327,429.75	72,174,547.00	2024-2027	Concessional loan and Grant	Committed	Mitigation	Energy		0	0	Planned	It is expected that this intervention will lead to a reduction in energy consumption and CO2 emissions	
The integration of renewable energy from solar thermal sources and heat pumps with a heat storage system into the district heating system in Novi Sad.	The integration of renewable energy produced from solar thermal sources and heat pumps into the district heating system of Novi Sad.	EBRD	City and district heating plant Novi Sad	MoME/ District heating plant Novi Sad	12,336,812,094.60	117,493,448.52	2024-2030	Concessional loan And Grant	Committed	Mitigation	Energy		0	0	Planned	It is expected that this intervention will lead to an increase in the share of renewable energy sources in final energy consumption, a reduction in energy consumption, and a decrease in CO2 emissions.	

Title of activity, programme, project or other	Programme/ project description	*Channel*	Recipient entity	Implementing entity	Amount received *(climate-specific)*		Time Frame	Financial Instrument	Status	Type of Support	Sector	Sub-Sector	Contribution to technology development and transfer objectives	Contribution to capacity- building Objectives	Status of activity	Use, impact and estimated results	Additional Information
					Domestic currency (RSD)	USD											
Technical Assistance for Improvement of Climate Change Policy Framework	Improvement of climate change policy and legal framework, further development of capacities for implementation of climate change policy and legal framework and development of mechanisms for support of industry related to decarbonization	IPA 2021	MoEP				2024-2026	Grant	Committed	Cross- cutting	Cross-cutting		0	1	Planned	A Roadmap for further improvement of policy planning in the field of climate change will be developed, the legal and institutional frameworks will be enhanced, the capacities of national institutions will be strengthened, and Roadmaps for decarbonization will be prepared for at least four different ETS and/or non-ETS sectors.	
Development of the Biomass market in the Republic of Serbia (Component 2)	The program aims to introduce the use of renewable energy sources in selected heating plants in the Republic of Serbia for the production of thermal energy, transitioning from the use of fossil fuels to the use of biomass.	IPA 2018, WBIF, Government of Germany and KfW bank	District heating plants	MoME	3,748,041,007.20	35,695,628.64 Grant amount 11.900.000 EUR (IPA 2018: 900.000 EUR, WBIF 9.000.000 EUR and Gov of Germany 2.000.000 EUR; Concessional loan KfW bank 20.000.000 EUR	2025-2029	Concessional loan and Grant	Committed	Mitigation	Energy		1	1	Planned	Overall, the investment will lead to a 8% reduction in network losses; CO2 emissions will be 1,537 tons instead of 12,815 tons (reduced by 88%); SO2 emissions will be 0.8 tons instead of 78 tons (reduced by 99%); the billing for energy consumption will be based on actual usage, encouraging users to be more mindful of their energy consumption.	With the support of the program, investments will be made in heating plants in Majdanpek (primary heating pipeline for which there were no funds in the first phase), Novi Pazar (additional wood chip boiler), Vranje, Prijepolje, Rača, and Niš.

Title of activity, programme, project or other	Programme/ project description	*Channel*	Recipient entity	Implementing entity	Amount received *(climate-specific)*		Time Frame	Financial Instrument	Status	Type of Support	Sector	Sub-Sector	Contribution to technology development and transfer objectives	Contribution to capacity- building Objectives	Status of activity	Use, impact and estimated results	Additional Information
					Domestic currency (RSD)	USD											
Enhancing the resilience of Serbian forests and the carbon storage potential of the country to support and boost the decarbonization process through adaptation and mitigation investments	The project aims to support the Republic of Serbia in enabling the forestry sector to contribute to the country's climate change adaptation and mitigation goals and support the most vulnerable households. This will be achieved by enhancing the management capacities of key institutions and communities, expanding ecosystem services to reduce poverty, encouraging private companies to decarbonize their processes, and simultaneously contributing to forest restoration, improved management, and the stabilization and increase of carbon removal.	GCF	MAFWM	FAO	10,815,004,830.00	103,000,046.00	2025-2028	Concessional loan and Grant Grant USD 25,000,000	Committed, prepared, waiting for approval	Cross- cutting	Forestry		0	1	Planned	Improvement of forest management and governance to ensure adaptation to climate change and the reduction of degradation factors. Increase in the contribution of forests to the energy security of vulnerable communities and carbon removal, while enhancing resilience through investments in climate change adaptation. Support for private sector engagement in forest management and "greening" the value chain of wood biomass. The combined impact of these actions will enable Serbia to reduce the vulnerability of its forestry sector and increase overall carbon dioxide removal, while simultaneously enhancing biodiversity and capitalizing on the role of forests in protecting and supporting the most vulnerable communities.	

Table III.8

Information on technology development and transfer support needed by the Republic of Serbia under Article 10 of the Paris Agreement

Exchange rate used: 105 RSD: 1 USD

Sector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected time frame	Expected financial instrument	Type of support	Contribution to capacity- building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
			Domestic currency (RSD)	USD							
Cross-cutting	ACTION PLAN of CLIMATE CHANGE ADAPTATION PROGRAM: Measure 1.2. Developing climate change adaptation research programme	Activity 1.2.1.: Preparing an analysis of the representation of scientific research projects financed by the Science Fund with a contribution to climate change adaptation (completed and ongoing) and identifying priority scientific topics contributing to climate change adaptation	600,000.00	5,714.00	by 2026	Grant	Adaptation	1	1	The research program in the field of adaptation to changed climatic conditions will contribute to climate change adaptation	The entity responsible for implementation of the activity: MoEP in cooperation with Science Fund, universities and other scientific institutions
Industry	NECP MP_D5: Implementation of best available technologies in production processes in specific industries	Modernization of industrial process technologies and increased material efficiency for the prevention of pollutants in air, water, soil with application of best available technologies (BAT) in accordance with BREF documents for specific areas of industrial production.	3,480,000,000.00	33,142,857.00	2024-2030	Grant	Mitigation	1	1	Contribution to the objective of reduction of GHG emissions by 33.3% (without LULUCF) by 2030 compared to 1990 levels through non-energy related GHG emission reductions by the modernization of industrial process technologies.	The entity responsible for implementation of the activity: MoEP, Ministry of Finance
Industry	NECP MP_D5.1: Measures for the reduction of emissions of fluorinated gases with greenhouse effect in the refrigeration and air conditioning equipment	Indicative measures include: Reduction of the consumption of fluorinated gases with greenhouse effect (HFC) in accordance with the established deadlines and obligations according to the ratified Kigali amendment Implementation and improvement of established system for training and certification of refrigeration and air-conditioning repair technicians.	Estimated implementation costs are unknown	Estimated implementation costs are unknown	2024-2030	Grant	Mitigation	1	1	Contribution to the objective of reduction of GHG emissions by 33.3% (without LULUCF) by 2030 compared to 1990 levels	The entity responsible for implementation of the activity: MoEP
Agriculture	NECP MP_D10: Measures for the reduction of CH4 emissions from the enteric fermentation of animals	Measure will facilitate the reduction of CH4 emissions through the modification of the feed composition and nutrition practice in livestock through practical training and demonstration for farmers.	60,000,000.00	571,429.00	2024-2030	Grant	Mitigation	1	1	CH4 emissions reduction will contribute to the objective of reduction of GHG emissions by 40.3% (with LULUCF) by 2030 compared to 1990 levels	The entity responsible for implementation of the activity: MAFWM, Directorate for Agrarian payments, Veterinary Directorate, Chamber of Commerce and Industry, research institutes
Agriculture	NECP MP_D11: Improvement of manure management for the reduction of CH4 and N2O emissions	Facilitate the reduction of both CH4 and indirect nitrous oxide (N2O) emissions through the improvement of manure management by anaerobic digestion	1,080,000,000.00	10,285,714.00	2024-2030	Grant	Mitigation	1	1	Reduction of CH4 and nitrous oxide (N2O) emissions will contribute to the objective of reduction of GHG emissions by 40.3% (with LULUCF) by 2030 compared to 1990 levels.	The entity responsible for implementation of the activity: MAFWM, Directorate for Agrarian payments, Agricultural Land Directorate, Farmers Research institutes
Agriculture	NECP MP_D12: Measures for the reduction of direct and indirect N2O emissions from managed soils	Facilitate the N2O emission reduction from managed soils through the following indicative ways: • Using less nitrogen fertiliser. • Using split applications of nitrogen fertilisers • Using legume crops or pastures in the rotation instead of nitrogen fertiliser. • Using minimum tillage for cropping. • Preventing waterlogging • Using nitrification inhibitors.	720,000,000.00	6,857,143	2024-2030	Grant	Mitigation	1	1	N2O emission reduction will contribute to the objective of reduction of GHG emissions by 40.3% (with LULUCF) by 2030 compared to 1990 levels	The entity responsible for implementation of the activity: MAFWM, Directorate for Agrarian payments, Agricultural Land Directorate, Farmers Research institutes

Sector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected time frame	Expected financial instrument	Type of support	Contribution to capacity- building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
			Domestic currency (RSD)	USD							
Agriculture	NECP MP_D13: Measures for reducing emissions from fertilizers use	Facilitate the reduction of ammonia and nitrous oxide emissions resulting from the use of fertilizers through the application of new technologies.	3,360,000,000.00	32,000,000.00	2024-2030	Grant	Mitigation	1	1	Reduction of ammonia and nitrous oxide emissions resulting from the use of fertilizers will contribute to the objective of reduction of GHG emissions by 40.3% (with LULUCF) by 2030 compared to 1990 levels.	The entity responsible for implementation of the activity: MAFWM, Agricultural Advisory Service, Directorate for Agrarian payments, Agricultural Land Directorate, Chamber of Commerce and Industry, farmers
Energy	NECP MP_D21 Supporting electricity production from renewable stations that will not participate into the auctions including the deployment of renewables power purchase agreements	Investment and regulatory measures will foresee the provision of operational aid primarily for small scale-decentralized RES systems. The support will be designed taking into consideration the potential benefits to the electricity grids, due to the avoided investments for the adaptation, enhancement and expansion of the grid networks, and supporting households as micro-investors. Indicative budget include investment measure: NECP MP_D22: Provision of economic support to innovative and demonstration pilot RES projects, such as installation of floating photovoltaics power plants and vertical wind turbines, the promotion of small wind turbines, the construction of concentrated solar power plants and the development of enhanced geothermal systems. Also, Indicative budget include investment measure: NECP MP_D26: Fostering the self-consumption of the produced electricity, for the installation of decentralized renewable energy systems as well as measure: NECP MP_D36 Promotion of RES communities (incentives will be provided so as to foster the further deployment of renewable energy sources, such as wind parks and photovoltaic stations).	84,000,000,000.00	800,000,000.00	2025-2030	Grant	Mitigation	1	1	Increase share of RES in electricity production The promoted renewable energy technologies will also lead to primary energy savings, contributing to the achievement of relevant goals The implementation of renewable energy technologies will reduce dependence on energy imports and increase the use of domestic energy sources.	The entity responsible for implementation of the activity: MoME and Ministry of Finance
Energy	NECP MP_Д31 Facilitating the penetration of RES into district heating networks	Investment measure will support the further penetration of renewable energy technologies into the existing and planned district heating networks by providing specific economic incentives. Moreover, the potential imposition of a mandatory quota in the utilization of renewable energy sources as fuel in the district heating networks will be scrutinized. Finally, the initiation of modern low-temperature district heating systems will be examined, connecting local demand with all renewable and waste energy sources, as well as the wider electric and gas grid. The utilization of centralised heat pumps as pilot projects will be explored, also under the prerequisite that their investment cost will be decreased	6,240,000,000.00	59,428,571.00	2025-2030	Grant	Mitigation	0	1	2,65 ktoe of biomass 19,06 ktoe of solar energy An increasing share of RES in heating and cooling will lead to primary energy savings, contributing to the achievement of relevant goals. The implementation of renewable energy technologies will reduce dependence on energy imports and increase the use of domestic energy sources.	The entity responsible for implementation of the activity: MoME and LSG units
Transport	NECP MP_D32 Fostering the production of advanced biofuels for use in transport sector	Investment merasue will foster the production of domestic biofuels according to the requirements of the Directive 2018/2001/EU through the provision of subsidies and fiscal incentives.	12,000,000,000.00	114,285,714.00	2025-2030	Grant	Mitigation	0	1	Increase share of RES in transport: 49 ktoe of biofuels without the effect of multipliers (58 million lt of biofuels). The foreseen biofuels consist of both imported biodiesel and bioethanol and domestically produced biodiesel and bioethanol.	The entity responsible for implementation of the activity: MoME

Sector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected time frame	Expected financial instrument	Type of support	Contribution to capacity- building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
			Domestic currency (RSD)	USD							
Transport	NECP MP_D33 Fostering the consumption of biofuels in transport sector	This measure will promote the further consumption of biofuels through the imposition of mandatory quota for the suppliers and blending thresholds for the case of biodiesel and bio gasoline taking into consideration the minimum technical limits, which can be considered as acceptable for the current vehicle stock. The cultivation of fast-growing energy plants for the production of biofuels, which can be used in transport sector, will be explored. Indicative budget include measure: MP_D40 Development of effective supply chains for the exploitation of the available potential of biofuels, bioliquids and biomass, that plans to provide economic support for equipment and infrastructure in supply stages, such as production, processing, transportation, and biomass storage. Moreover, the potential imposition for collecting the biomass in the form of gate-fee levy will be examined in order to increase the quantities of biomass, which will be utilized for energy production. The compliant biofuels, bioliquids and biomass fuels with the sustainability and greenhouse gas emissions saving criteria will be supported, as foreseen by the Directive 2018/2001/EU.	60,000,000.00	571,429.00	2025-2030	Grant	Mitigation	1	1	Increase share of RES in transport The implementation of renewable energy technologies will reduce dependence on energy imports and increase the use of domestic energy sources.	The entity responsible for implementation of the activity: MoME including MAFWM for measure MP_D40.
Cross-cutting	NECP MP_D38 Supporting demonstration projects for the promotion of biomethane and renewable hydrogen	Investment measure will finance the design and implementation of demonstration projects for the production and utilization of biomethane and renewable hydrogen so as to be consumed in all end-use sectors contributing to the meaningful reduction of their production cost and improving their technical feasibility in regard to Hydrogen and biomethane transportation with the existing natural gas network.	4,200,000,000.00	40,000,000.00	2025-2030	Grant	Mitigation	1	1	87 ктое of biomethane Increase share of RES in electricity, increase share of RES in heating and cooling and increase share of RES in transport, thereby contributing to the expected share of biofuels, bioliquids, and biomass.	The entity responsible for implementation of the activity: MoME
Industry	NECP MP_EE21 Support schemes for the promotion of energy efficiency in the industrial sector	Investment measure will initiate a targeted support scheme for the implementation of energy efficiency projects in the industrial sector by combining various financial and fiscal instruments, such as direct financial support, low-interest loans, tax deductions, credit lines and guarantees The implementation measure is linked also with mandatory implementation of energy audits and development of energy management systems in order to identify the most cost-effective energy efficiency interventions which would enable economic support. Indicative budget include measure: NECP MP_EE22 Regulatory measures for the promotion of energy efficiency in the industrial sector, will facilitate the further deployment of the best available technologies in compliance with the respective legislation (Industrial Emission Directive), while the development of the appropriate monitoring and surveillance mechanism will be considered as a vital prerequisite for the implementation of the measure. Moreover, the application of the eco-design requirements will ensure the penetration of energy efficient technologies and equipment	403,920,000,000.00	3,846,857,143.00	2025-2030	Grant	Mitigation	1	1	The achieved energy savings will reduce fossil fuel consumption, leading to a decrease in GHG emissions. The achieved energy savings will reduce fossil fuel import and consumption, leading to reduction in dependence on energy imports.	The entity responsible for implementation of the activity: MoME Ministry of Economy, Ministry of Finance For measure EE22: The entity responsible for implementation of the activity: MoME and MoEP
Energy	NECP MP_EE34 Regulatory measures and financing programs for promoting/modernizing high efficient CHP units and district heating/cooling networks	Investment and reform measures will launch financial programs for the installation of new and the modernization of existing highly efficient CHP units and district heating/cooling networks. In the case of the new highly efficient CHP units, planned incentives will be carried out in alignment with the Law on Energy Efficiency and Rational Use of Energy. Emphasis will be placed on exploiting waste heat mainly by the industrial activities in the materialised highly efficient CHP units and district heating/cooling networks. The foreseen investments will be designed in conjunction with the respective one within the framework of PM_EE23	4,200,000,000.00	40,000,000.00	2025-2030	Grant	Mitigation	1	1	23 MW (Electricity output: 31 ktoe, Heat output for district heating: 6 ktoe, Industrial heat output: 13 ktoe)	The entity responsible for implementation of the activity: MoME, EE Directorate LSG units, Heating plants

Sector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected time frame	Expected financial instrument	Type of support	Contribution to capacity- building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
			Domestic currency (RSD)	USD							
Energy	NECP MP_IEM9 Investments related to the digitalisation of the networks aiming at increasing RES integration and improvement of quality of supply	Investment measure refers to a policy- and financially-backed programme with the aim to promote smart grids and in particular prioritise the application of IEC 61850, the designation of sensing points and forecasting tools for demand and RES forecasting at mid and short-term time scales, the monitoring of quality of supply parameters (sags, swells, etc), as well as, the dynamic line rating for lines and cabling at important nodes to the system. These measures are expected to improve the observability of dynamic phenomena and improve the forecasting accuracy by the network operators. In addition, the measure envisages the installation of DLR and FACTS devices on the transmission network in parts that are considered to allow greater flexibility in the integration of renewable sources.	1,200,000,000.00	11,428,571.00	2026-2030	Grant	Mitigation	1	1	Increased system flexibility and quality of electricity supply, in particular through policies and measures related to market-based price formation in compliance with applicable law; market integration and coupling, aiming to increase the tradeable capacity of existing interconnectors, smart grids, aggregation, demand response, storage, distributed generation, mechanisms for dispatching, re-dispatching and curtailment and real-time price signals. This also includes the improvement of cybersecurity and resilience in the energy sector.	The entity responsible for implementation of the activity: MoME JSC "Elektromreza Srbije" Elektrodistribucija Srbije ltd. Belgrade

Table III.9

Information on technology development and transfer support received by the Republic of Serbia under Article 10 of the Paris Agreement

Exchange rate used:105 RSD: 1 USD

Title of activity, programme, project or other	Programme/ project description	*Channel*	Recipient entity	Implementing entity	Amount received *(climate-specific)*		Time Frame	Financial Instrument	Status	Type of Support	Sector	Contribution to capacity-building Objectives	Status of activity	Use, impact and estimated results	Additional Information
					Domestic currency (RSD)	USD									
Removing Barriers to Promote and Support the Energy Management System in Municipalities in Serbia (EMIS 1)	To increase investments in energy efficiency in public buildings and utility services within the competences of municipalities in order to improve their energy and cost efficiency through: • Development of legal, regulatory and institutional framework related to energy efficiency • Co-financing of at least 10 demonstration energy efficiency projects in public buildings / utility services on the basis of public call to units of LSG • Raising public awareness regarding energy efficiency	GEF and UNDP	MoME	UNDP	262,500,000.00	2,500,000.00	2015-2021	Grant	Received	Mitigation	Energy	1	Completed	It is expected that this intervention will lead to a reduction in energy consumption and CO2 emissions	
Climate Smart Urban Development Challenge	The objective of this project to identify and promote climate-smart solutions for mitigating climate change at the local level in the Republic of Serbia. To do so, the Project formulates Challenges for identification and support of different ICT, technological solutions and business ideas that can be applied at the level of local self-governments to increase the share of "climate proof" public services. A call for ideas was open for local self-governments, business sector, research and scientific community, CSO etc.	GEF	MoEP	UNDP	365,227,380.00	3,478,356.00	2017-2023	Grant	Received	Cross- cutting	Cross-cutting	1	Completed	Enhancing capacities for combating climate change and managing natural resources. Communities are more resilient to the impacts of natural disasters and human-induced catastrophes.	
Development of the Biomass market in the Republic of Serbia (Component 1)	The program aims to introduce the use of renewable energy sources in selected heating plants in the Republic of Serbia for the production of thermal energy, transitioning from the use of fossil fuels to the use of biomass (wood chips) and geothermal energy sources.	SECO, Government of Germany and KfW bank	District heating plants	MoME	3,142,949,747.70	29,932,855 Grant amount SECO 4.750.000 EUR; Grant of Gov of Germany 2.000.000 EUR; Concessional loan KfW bank 20.000.000 EUR with 1,1% Annual interest rate	2018-2024	Concessional loan and Grant	Received	Mitigation	Energy	1	Completed	The investment resulted in a reduction of CO2 emissions by 88% and SO2 emissions by 99%. The share of renewable energy sources in the total fuel consumption reached 90%.	With the support of the program, four biomass heating plants were built in the cities of: Priboj, Mali Zvornik, Novi Pazar, and Majdanpek.

Title of activity, programme, project or other	Programme/ project description	*Channel*	Recipient entity	Implementing entity	Amount received *(climate-specific)*		Time Frame	Financial Instrument	Status	Type of Support	Sector	Contribution to capacity-building Objectives	Status of activity	Use, impact and estimated results	Additional Information
					Domestic currency (RSD)	USD									
Strengthening Disaster Resilience in Agriculture	Expected results of the project are: • Institutional and capacity gap assessment in the Ministry of Agriculture, Forestry and Water Management in Disaster Risk Reduction/Management and Climate Smart Agriculture • Support for agricultural expert services in disaster risk reduction and climate-resilient agriculture • Support for the agricultural education system in the field of climate change • Establishment of demonstration fields for the application of climate-resilient agriculture principles • Training for farmers in disaster risk reduction and climate-resilient agriculture	EU	MAFWM	FAO	292,818,663.90	2,788,749.18	2020-2026		Received	Adaptation	Agriculture	1	Ongoing	It is of great importance for adaptation to climate change.	Implemented entity: MAFWM, Agricultural Advisory Service
Rehabilitation of the district heating system in Serbia – Phase V	Rehabilitation of the district heating system in Belgrade, Bor, Jagodina, Leskovac, Negotin, Niš, and Senta. Goal: Increase energy efficiency and reduce harmful gas emissions.	Government of Germany through KfW	Direct borrowing of the Republic of Serbia – the right to use transferred to the participating heating plants.	MoME	3,759,790,352.85	Total 35,807,527 Loan: 33,569,557 Grant: 2,237,970	2020-2026	Concessional loan and Grant	Received	Mitigation	Energy	1	Ongoing	Estimated results: A 15% increase in energy efficiency in the rehabilitated parts of the system, and a reduction in CO2 emissions by 70,000 tons per year.	
Energy efficiency in public buildings and renewable energy sources in the district heating sector ("Greening the public sector") - Renovation of the VMA hospital, Phase 1A	The project for the rehabilitation of the Military Medical Academy (VMA) includes the implementation of energy efficiency measures on the building's thermal envelope, technical systems for air conditioning, heating, and cooling, as well as the preparation of sanitary hot water using renewable energy sources. It also includes measures aimed at improving the functionality of the hospital.	KfW and EU WBIF	MoME	PMO Consultant– M4H Gmbh – Frankfurt, Federal Republic of Germany, and the Project Implementation Unit. (members MoME, Ministry of Defense and VMA)	587,467,242.60	5,594,926.12	2020 –2028	Grant	Received	Mitigation	Energy	1	Ongoing	It is expected that this intervention will lead to a reduction in energy consumption and CO2 emissions	

Title of activity, programme, project or other	Programme/ project description	*Channel*	Recipient entity	Implementing entity	Amount received *(climate-specific)*		Time Frame	Financial Instrument	Status	Type of Support	Sector	Contribution to capacity-building Objectives	Status of activity	Use, impact and estimated results	Additional Information
					Domestic currency (RSD)	USD									
Green Agenda for Serbia	To contribute to the efficient, inclusive and sustainable implementation of the Green Agenda in Serbia by: improving the strategic and legislative framework, co-financing implementation of innovative pilot projects and mobilizing additional financing for scale-up investments. In this way, the project will contribute to the green transformation of economy and society in Serbia.	EU - IPA 2020 Embassy of Sweden EIB with additional funding from the Government of Sweden, Switzerland and Serbia	MoEP	UNDP	540,474,480.00	5,147,376.00	2021-2024	Grant	Received	Cross- cutting	Cross-cutting	1	Ongoing	1. Support to MEP on establishment of MRVA in Serbia in accordance with Law on Climate Change 2. Based on the legal framework for GHG emissions permitting requirements the activity will support capacity building for MEP and SEPA regarding implementation of the newly established permitting requirements. 3. Development of an IT system/software for issuance of GHG emission permits. 4. Capacity building of operators on their legal obligations on preparing proper GHG monitoring plans, GHG emission reports and to apply for the GHG Permit. socio-economic benefits and prepare for compliance. 5. Selection of up to 10 EU ETS operators and up to 10 public and private entities from non-ETS sectors and assisting them in identification of best technologies for lowering their carbon intensity	
Energy Efficiency in Central Government Buildings	The project covers the improvement of energy efficiency in 26 out of a total of 56 central government buildings (CGS). These central government buildings will undergo energy renovations through the reconstruction of the thermal envelope (replacement of windows and installation of insulation), reconstruction of the heating system, reconstruction of the cooling and ventilation systems in buildings where they exist, and the installation of energy-efficient indoor lighting, resulting in an energy savings of approximately 30% in these buildings. To date, funding for the project has been secured through a loan of 40 million euros and a grant of 1.02 million euros.	CEB, WBiF, SIGA, SCA, UNDP through Resource Mobilization Facility (RMF) trust fund of Slovakia	MoME	UNDP	4,819,581,270.00	45,900,774	2021-2025	Grant and Loan	Received	Mitigation	Energy	1	Ongoing	A reduction in primary energy consumption by at least 30%, a reduction in CO2 emissions by approximately 20%, and savings of about 29% in energy operating costs. Additionally, the program is expected to improve working conditions and contribute to the protection and preservation of cultural heritage.	

Title of activity, programme, project or other	Programme/ project description	*Channel*	Recipient entity	Implementing entity	Amount received *(climate-specific)*		Time Frame	Financial Instrument	Status	Type of Support	Sector	Contribution to capacity-building Objectives	Status of activity	Use, impact and estimated results	Additional Information
					Domestic currency (RSD)	USD									
Reducing the carbon footprint of local communities by applying the principles of the circular economy in the Republic of Serbia - Circular Communities	Project goal is Encouraging the development and supporting the implementation of circular ideas, business models and products of public and private companies, in order to reduce the carbon footprint of local communities in Serbia	GEF Republic of Sebia UNDP	MoEP	UNDP	305,922,225.00	2,913,545.00	2022 -2027	Grant	Received	Mitigation	Cross-cutting	1	Ongoing	Establish a supportive public policy and institutional framework aligned with EU circular economy policies, including training to improve the knowledge and skills of stakeholders, as well as encouraging broad community participation in the development and implementation of such policies; Establish a Low Carbon Communities Innovation Platform – LCCIP, in order to identify and support new business ideas, products, investments in the area of circular economy and efficient use of resources; Pilot investments in the area of circular economy; Spread knowledge and raise public awareness on the importance of circular economy.	
Just Green Transition and Decarbonisation in Serbia	Project goal is Contributing to the achievement of Serbia's Nationally Determined Contribution (NDC) targets of 33,3% compared to 1990 level by 2030. Project focus Facilitation of wide consultation process and comprehensive dialogues with all relevant stakeholders for strategic planning and implementation of fair green transition, resulting in respective socio-economic analysis, conclusions and roadmap on just green transition Supporting concrete investments for green technology projects and innovative business models	Government of Japan Swiss Agy for Development & Cooperation State Secretariat for Eco Affairs Republic of Serbia	MoME and MoEP	UNDP	511,982,310	4,876,022.00	2022-2023	Grant	Received	Mitigation	Cross-cutting	1	Completed	Project helped to identify and use technologies and innovative business models in sectors most affected by decarbonization, while ensuring the principles of a just transition are incorporated into it. 12,563 t/CO2 emissions reduced in the 1st year of implementation of 8 supported projects, with prospects of reaching a cumulative level of 230,147.82 t/CO2e in a 20-year horizon. 7,8 MW of RES installed 25 new green jobs created 38 representatives of public and private companies trained in Accelerator for decarbonisation and just transition 15 representatives of business and institutional stakeholders trained for KAIZEN management methodology 110 beneficiaries (workers, representatives of vulnerable groups etc.) trained for new jobs	Through the Innovation Challenge Call, the project co-financed 8 projects that contribute to achieving Serbia's NDC target in reducing the greenhouse gas emissions (GHG) emissions with 600.000 USD (around 6% of total investment value) and mobilized additional investments for these projects from corporate sector of approx. 10 million USD

Title of activity, programme, project or other	Programme/ project description	*Channel*	Recipient entity	Implementing entity	Amount received *(climate-specific)*		Time Frame	Financial Instrument	Status	Type of Support	Sector	Contribution to capacity-building Objectives	Status of activity	Use, impact and estimated results	Additional Information
					Domestic currency (RSD)	USD									
Innovative and Just Green Transition as Tool for Securing Systemic Energy Security and Reducing Energy Poverty	Ensuring energy security for all, reducing energy poverty in Serbia and contributing to achieving of the Nationally Determined Contribution (NDC) targets	Government of Japan Republic of Serbia	MoME and MoEP	UNDP	121,172,100.00	1,154,020.00	2023-2024	Grant	Received	Mitigation	Cross-cutting	1	Completed	Support to collectively respond to the climate emergency and establish resilient development pathways for sustaining human security and green transformation	Project focus was on Supporting innovative solutions that reduce import dependency, diversify energy sources, reduce energy intensity of the economy or enable access to clean and affordable energy for vulnerable population. and Improvements of legal and policy system on just green transition and energy poverty.
Clean energy and energy efficiency for citizens	The project will achieve energy savings through the implementation of energy rehabilitation of residential buildings, which will include the replacement of windows and doors, installation of insulation on roofs and walls, and replacement of heating systems, including the replacement of boilers and stoves, fuel change, and installation of solar collectors for heating sanitary hot water. The project will also promote the production of electricity from renewable energy sources by supporting the installation of solar panels in households.	World bank	MoME	MoME	5,275,455,838.80	50,242,437.56	2023-2027	Concessional loan	Received	Mitigation	Energy	1	Ongoing	This project is expected to lead to a reduction in energy consumption and CO2 emissions in the residential sector.	
Development of the Biomass market in the Republic of Serbia (Component 2)	The program aims to introduce the use of renewable energy sources in selected heating plants in the Republic of Serbia for the production of thermal energy, transitioning from the use of fossil fuels to the use of biomass.	IPA 2018, WBIF, Government of Germany and KfW bank	District heating plants	MoME	3,748,041,007.20	35,695,628.64 Grant amount 11.900.000 EUR (IPA 2018: 900.000 EUR, WBIF 9.000.000 EUR and Gov of Germany 2.000.000 EUR; Concessional loan KfW bank 20.000.000 EUR	2025-2029	Concessional loan and Grant	Committed	Mitigation	Energy	1	Planned	Overall, the investment will lead to a 8% reduction in network losses; CO2 emissions will be 1,537 tons instead of 12,815 tons (reduced by 88%); SO2 emissions will be 0.8 tons instead of 78 tons (reduced by 99%); the billing for energy consumption will be based on actual usage, encouraging users to be more mindful of their energy consumption.	With the support of the program, investments will be made in heating plants in Majdanpek (primary heating pipeline for which there were no funds in the first phase), Novi Pazar (additional wood chip boiler), Vranje, Prijepolje, Rača, and Niš.

Table III.10

Information on capacity-building support needed by the Republic of Serbia under Article 11 of the Paris Agreement

Exchange rate used:105 RSD: 1 USD

Sector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected timeframe	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Expected use, impact and estimated results	Additional information
			Domestic currency (RSD)	USD						
Cross-cutting	Further support for the establishment of a transparency framework in the Republic of Serbia (CBIT 2)	The aim of the project is to support the Republic of Serbia in establishing a national transparency framework in accordance with the provisions of the Paris Agreement	228,900,000	2,180,000	2025 -	GEF	Cross-cutting	0	The project is a continuation of the project implemented during the period 2019-2022 and directly contributes to strategic objectives in the field of climate change.	Beneficiary: MoEP Implementation: UNDP UNDP submitted a request for the second phase of the project. The application evaluation is in progress.
Cross-cutting	Continuation of Advancing Medium and Long-Term Adaptation Planning for Climate Change in the Republic of Serbia (NAP 2)	The aim of the project is to support the Republic of Serbia in monitoring the implementation of adaptation measures and actions.	94,500,000	900,000.00	2025 -	GEF	Adaptation	0	The project is a continuation of the project implemented during the period 2019-2023 and directly contributes to strategic objectives in the field of climate change.	Beneficiary: MAFWM and MoEP Implementation: UNDP UNDP submitted a request for the second phase of the project to GCF. The application evaluation is in progress.
Agriculture	Strengthening the resilience of small and medium-sized fruit and vegetable producers to climate change induced water insecurity in Central Serbia	The project is planned to implement Activity 3.1.2 from Action Plan of Climate Change Adaptation Program: Assessment of the capacities for using water from existing artificial reservoirs in Central Serbia for irrigation purposes	420,000,000.00	4,000,000.00	2025 -	GCF	Adaptation	0	The project results are expected to directly contribute to climate change adaptation	Beneficiary: MAFWM Implementation: UNDP Waiting for approval of the project.
Cross-cutting	ACTION PLAN of CLIMATE CHANGE ADAPTATION PROGRAM: Measure 1.2. Developing climate change adaptation research programme	Activity 1.2.1.: Preparing an analysis of the representation of scientific research projects financed by the Science Fund with a contribution to climate change adaptation (completed and ongoing) and identifying priority scientific topics contributing to climate change adaptation	600,000.00	5,714.00	by 2026	Grant	Adaptation	1	The research program in the field of adaptation to changed climatic conditions will contribute to climate change adaptation	The entity responsible for implementation of the activity: MoEP in cooperation with Science Fund, universities and other scientific institutions
Cross-cutting	ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 1.3. Integrating drought as a multidimensional climate hazard in the system for monitoring, timely alerts, and impact assessment, including damages and losses	Activity 1.3.1. Developing of a Methodology for Drought Monitoring of importance for all relevant sectors in the Republic of Serbia, taking into account all aspects of drought climate hazard and the time dimensions for which it is identified: from long-term to short-term.	2,950,000.00	28,095.00	By 2026	Grant	Adaptation	0	Methodology for Drought Monitoring as a multi-dimensional climate hazard will contribute to climate change adaptation	The entity responsible for implementation of the activity: MoEP in collaboration with RHMSS, MoI, MAFWM, SCC, universities and other scientific institutions
Agriculture	ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 1.6. Capacity strengthening and awareness raising for adaptation of agricultural production to climate change	Activity 1.6.3. Developing zoning methodology for fruit production areas in conditions of climate change Activity 1.6.4. Developing zoning methodology for viticulture production areas in conditions of climate change	4,424,000.00	42,133.00	by 2026	Grant	Adaptation	0	Zoning methodologies for fruit and viticulture production areas in conditions of climate change will contribute to adaptation of agriculture on climate change.	The entity responsible for implementation of the activity: MAFWM in collaboration with MoEP, universities and other scientific institutions
Agriculture	ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 1.6. Capacity strengthening and awareness raising for adaptation of agricultural production to climate change	Activity 1.6.5. Conducting a study on suitability of growing conditions and risks for agricultural production in conditions of climate change Activity 1.6.6. Conducting a study on suitability of growing conditions and risks for livestock farming in conditions of climate change Both studies include spatial mapping of areas with favourable climate and areas under climate risks, with recommendations for climate change adaptation.	5,900,000.00	56,190.00	by 2026	Grant	Adaptation	0	Studies on suitability of growing conditions and risks for agricultural production and for livestock farming will contribute to adaptation of agriculture on climate change.	The entity responsible for implementation of the activity: MAFWM in collaboration with MoEP, universities and other scientific institutions

Sector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected timeframe	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Expected use, impact and estimated results	Additional information
			Domestic currency (RSD)	USD						
Agriculture	ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 1.7. Improvement of agrometeorological services to provide the necessary information for increasing the resilience of agricultural production to climate change	Activity 1.7.2. Improvement of the RHMSS agrometeorological monitoring system by increasing the number of meteorological and agrometeorological stations, stations for measuring soil moisture content, and hydrological stations for surface water and groundwater	28.700.000.00	273,333.00	by 2026	Grant	Adaptation	0	The newly installed agrometeorological stations, soil moisture measurement stations, and hydrological stations will contribute to climate change adaptation.	The entity responsible for implementation of the activity: RHMSS
Energy	ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 1.10. Assessment of the climate change impact on hydrological parameters relevant for planning in the energy sector	Activity 1.10.1. Developing climate change impact assessment methodology and preparing a study on the climate change impacts on the availability and condition of water resources for the energy sector purposes	4,424,000.00	42,133.00	by 2026	Grant	Adaptation	0	climate change impact assessment methodology and study on the climate change impacts on the availability and condition of water resources for the energy sector purposes will contribute to climate change adaptation.	The entity responsible for implementation of the activity: MoEP in collaboration with MoME, RHMSS, universities and other scientific institutions
Energy	ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 1.11. Assessment of the changes in the distribution regime of heating and cooling degree days under climate change and development of the monitoring and forecasting system for heating and cooling degree days, to improve planning of capacities for energy production	Activity 1.11.1. Developing the impact assessment methodology and preparing a study on the climate change impacts on the heating and cooling degree days distribution regime in the observed and future climate Conditions Activity 1.11.2. Developing the methodology for monitoring and forecast of heating and cooling degree days, including seasonal forecasts	5,898,000.00	56,172.00	by 2026	Grant	Adaptation	0	Study on the climate change impacts on the heating and cooling degree days distribution regime in the observed and future climate Conditions and methodology for monitoring and forecast of heating and cooling degree will improve energy production capacity planning and contribute to climate change adaptation.	The entity responsible for implementation of the activity: MOEP in collaboration with MoME, RHMSS, MCTI, universities and other scientific institutions
Other (Health)	ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 1.12. Improving the prevention and monitoring of the climate change impact on human health	Activity 1.12.1. Developing a methodology for climate change assessment and vulnerability monitoring for the health sector, and particularly for the vulnerable populations with a proposal for climate change adaptation measures	1,475,000.00	14,048.00	by 2026	Grant	Adaptation	0	Methodology for climate change assessment and vulnerability monitoring for the health sector on climate change conditions will contribute to climate change adaptation.	The entity responsible for implementation of the activity: MH in collaboration with MoEP, RHMSS, universities and other scientific institutions
Other	ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 1.13. Developing a methodology for monitoring the biodiversity status and climate vulnerability	Activity 1.13.1. Developing methodology for status monitoring and vulnerability assessment of species, habitats and ecosystems, with proposed climate change adaptation measures	2,212,000.00	21,067.00	by 2026	Grant	Adaptation	0	Methodology for status monitoring and vulnerability assessment of species, habitats and ecosystems, with proposed climate change adaptation measures	The entity responsible for implementation of the activity: MoEP in collaboration with SEPA, The Institute for Nature Conservation of Serbia, Provincial Institute for Nature Conservation
Agriculture	ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 3.1. Optimizing irrigation in line with needs and resources	Activity 3.1.1 Preparing assessment of needs for artificial water reservoirs and atmospheric water reception and storage capacities (including micro-reservoirs) to assess the possibility for reservoirs construction and costs, for agricultural crop irrigation purposes	6,000,000.00	57,143.00	by 2026	Grant	Adaptation	0	Study on needs for artificial water reservoirs and atmospheric water reception and storage capacities will contribute to climate change adaptation.	The entity responsible for implementation of the activity: MAFWM in collaboration with MoEP, universities and other scientific institutions
Transport	ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 3.2. Road infrastructure climate vulnerability and risk assessment	Activity 3.2.1 Developing methodology for climate change vulnerability and risk assessment for road infrastructure, with the possibility of vulnerability and risk levels spatial distribution mapping	15,000,000.00	142,857.00	by 2026	Grant	Adaptation	0	Methodology for climate change vulnerability and risk assessment for road infrastructure	The entity responsible for implementation of the activity: PU Putevi Srbije, MCTI in collaboration with RHMSS, MoEP, universities and other scientific institutions

Sector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected timeframe	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Expected use, impact and estimated results	Additional information
			Domestic currency (RSD)	USD						
Cross-cutting	NECP MP_D2: Monitoring the implementation of the Low Carbon Development Strategy of the Republic of Serbia for the period 2023-2030, with projections until 2050, and the Program for Adaptation to Changed Climate Conditions for the period 2023 to 2030	Facilitate the process of monitoring and revision of the adopted Low-Carbon Development Strategy as well as implementation of Program of adaptation to changed climate conditions with Action Plan.	168,000,000.00	1,600,000.00	2023-2030	Grant	Cross-cutting	0	Reducing GHG emissions and increasing resilience to climate change. Contribution to the objective of reduction of GHG emissions by 33.3% (without LULUCF) by 2030 compared to 1990 levels.	The entity responsible for implementation of the activity: MoEP
Industry	NECP MP_D5: Implementation of best available technologies in production processes in specific industries	Modernization of industrial process technologies and increased material efficiency for the prevention of pollutants in air, water, soil with application of best available technologies (BAT) in accordance with BREF documents for specific areas of industrial production.	3,480,000,000.00	33,142,857.00	2024-2030	Grant	Mitigation	1	Contribution to the objective of reduction of GHG emissions by 33.3% (without LULUCF) by 2030 compared to 1990 levels through non-energy related GHG emission reductions by the modernization of industrial process technologies.	The entity responsible for implementation of the activity: MoEP, Ministry of Finance
Industry	NECP MP_D5.1: Measures for the reduction of emissions of fluorinated gases with greenhouse effect in the refrigeration and air conditioning equipment	Indicative measures include: Reduction of the consumption of fluorinated gases with greenhouse effect (HFC) in accordance with the established deadlines and obligations according to the ratified Kigali amendment Implementation and improvement of established system for training and certification of refrigeration and air-conditioning repair technicians.	Estimated implementation costs are unknown	Estimated implementation costs are unknown	2024-2030	Grant	Mitigation	1	Contribution to the objective of reduction of GHG emissions by 33.3% (without LULUCF) by 2030 compared to 1990 levels	The entity responsible for implementation of the activity: MoEP
Forestry	NECP MP_D7. Sustainable forest management (forest land, remaining forest land)	The measure aims to reverse the loss of forest cover through sustainable forest management, including a ban on the cutting down of forest for the first level of protection and limited for the second level in sustainable and strictly controlled manner, protection, restoration, afforestation and reforestation and increase efforts to prevent forest degradation, convert coppice forests to tall forests, control invasive species and afforestation with autochthonous species, restoration of moist habitats of lowland forests and expansion of riparian zones along watercourses	42,480,000,000.00	404,571,429.00	2024-2030	Grant	Cross-cutting	0	The reverse the loss of forest cover through sustainable forest management will contribute to the objective of reduction of GHG emissions by 40.3% (with LULUCF) by 2030 compared to 1990 levels	The entity responsible for implementation of the activity: MAFWM, research institutes, organizations responsible for forest management, private forest owners
Agriculture	NECP MP_D8: Waste lands conversion to croplands	The measure will facilitate conversion of non-irrigated lands on inclined terrains into perennial grassland, which will significantly decrease intensity of soil organic matter depletion and emission of soil carbon and will lead to carbon sink. Its implementation should be supported by incentives, especially in the first years of conversion, to enable farmers to convert these waste lands into arable land.	1,020,000,000.00	9,714,286.00	2024-2030	Grant	Mitigation	0	Contribution to the objective of reduction of GHG emissions by 40.3% (without LULUCF) by 2030 compared to 1990 levels	The entity responsible for implementation of the activity: MAFWM
Forestry	NECP MP_D9: Increase the tree-planted areas (groves / parks / green roofs, sanitary protection zones around mines and industrial buildings, wind protection belts and green zones next to highways)	This Investment and reform measure envisage numerous initiatives and information campaigns for citizens, explaining the environmental benefits in terms of the reduction of CO2 emissions, as well as through the provision of financial incentives. A potential provision of legal obligations for investors will be explored in order to regenerate green areas as well as the construction of sanitary and wind protection zones around mines, industrial facilities that are significant emitters of waste gases, along highways and traffic roads.	780,000,000.00	7,428,571.00	2024-2030	Grant	Cross-cutting	0	Contribution to climate change adaptation and emission reduction.	The entity responsible for implementation of the activity: MoEP, MAFWM, MCTI
Agriculture	NECP MP_D10: Measures for the reduction of CH4 emissions from the enteric fermentation of animals	Measure will facilitate the reduction of CH4 emissions through the modification of the feed composition and nutrition practice in livestock through practical training and demonstration for farmers.	60,000,000.00	571,429.00	2024-2030	Grant	Mitigation	1	CH4 emissions reduction will contribute to the objective of reduction of GHG emissions by 40.3% (with LULUCF) by 2030 compared to 1990 levels	The entity responsible for implementation of the activity: MAFWM, Directorate for Agrarian payments, Veterinary Directorate, Chamber of Commerce and Industry, research institutes

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			Domestic currency (RSD)	USD						
Agriculture	NECP MP_D11: Improvement of manure management for the reduction of CH4 and N2O emissions	Facilitate the reduction of both CH4 and indirect nitrous oxide (N2O) emissions through the improvement of manure management by anaerobic digestion	1,080,000,000.00	10,285,714.00	2024-2030	Grant	Mitigation	1	Reduction of CH4 and nitrous oxide (N2O) emissions will contribute to the objective of reduction of GHG emissions by 40.3% (with LULUCF) by 2030 compared to 1990 levels.	The entity responsible for implementation of the activity: MAFWM, Directorate for Agrarian payments, Agricultural Land Directorate, Farmers Research institutes
Agriculture	NECP MP_D12: Measures for the reduction of direct and indirect N2O emissions from managed soils	Facilitate the N2O emission reduction from managed soils through the following indicative ways: • Using less nitrogen fertiliser. • Using split applications of nitrogen fertilisers • Using legume crops or pastures in the rotation instead of nitrogen fertiliser. • Using minimum tillage for cropping. • Preventing waterlogging • Using nitrification inhibitors.	720,000,000.00	6,857,143	2024-2030	Grant	Mitigation	1	N2O emission reduction will contribute to the objective of reduction of GHG emissions by 40.3% (with LULUCF) by 2030 compared to 1990 levels	The entity responsible for implementation of the activity: MAFWM, Directorate for Agrarian payments, Agricultural Land Directorate, Farmers Research institutes
Agriculture	NECP MP_D13: Measures for reducing emissions from fertilizers use	Facilitate the reduction of ammonia and nitrous oxide emissions resulting from the use of fertilizers through the application of new technologies.	3,360,000,000.00	32,000,000.00	2024-2030	Grant	Mitigation	1	Reduction of ammonia and nitrous oxide emissions resulting from the use of fertilizers will contribute to the objective of reduction of GHG emissions by 40.3% (with LULUCF) by 2030 compared to 1990 levels.	The entity responsible for implementation of the activity: MAFWM, Agricultural Advisory Service, Directorate for Agrarian payments, Agricultural Land Directorate, Chamber of Commerce and Industry, farmers
Energy	NECP MP_D21 Supporting electricity production from renewable stations that will not participate into the auctions including the deployment of renewables power purchase agreements	Investment and regulatory measures will foresee the provision of operational aid primarily for small scale-decentralized RES systems. The support will be designed taking into consideration the potential benefits to the electricity grids, due to the avoided investments for the adaptation, enhancement and expansion of the grid networks, and supporting households as micro-investors. Indicative budget include investment measure: NECP MP_D22: Provision of economic support to innovative and demonstration pilot RES projects, such as installation of floating photovoltaics power plants and vertical wind turbines, the promotion of small wind turbines, the construction of concentrated solar power plants and the development of enhanced geothermal systems. Also, Indicative budget include investment measure: NECP MP_D26: Fostering the self-consumption of the produced electricity, for the installation of decentralized renewable energy systems as well as measure: NECP MP_D36 Promotion of RES communities (incentives will be provided so as to foster the further deployment of renewable energy sources, such as wind parks and photovoltaic stations).	84,000,000,000.00	800,000,000.00	2025-2030	Grant	Mitigation	1	Increase share of RES in electricity production The promoted renewable energy technologies will also lead to primary energy savings, contributing to the achievement of relevant goals The implementation of renewable energy technologies will reduce dependence on energy imports and increase the use of domestic energy sources.	The entity responsible for implementation of the activity: MoME and Ministry of Finance

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Transport	NECP MP_D33 Fostering the consumption of biofuels in transport sector	This measure will promote the further consumption of biofuels through the imposition of mandatory quota for the suppliers and blending thresholds for the case of biodiesel and bio gasoline taking into consideration the minimum technical limits, which can be considered as acceptable for the current vehicle stock. The cultivation of fast-growing energy plants for the production of biofuels, which can be used in transport sector, will be explored. Indicative budget include measure: MP_D40 Development of effective supply chains for the exploitation of the available potential of biofuels, bioliquids and biomass, that plans to provide economic support for equipment and infrastructure in supply stages, such as production, processing, transportation, and biomass storage. Moreover, the potential imposition for collecting the biomass in the form of gate-fee levy will be examined in order to increase the quantities of biomass, which will be utilized for energy production. The compliant biofuels, bioliquids and biomass fuels with the sustainability and greenhouse gas emissions saving criteria will be supported, as foreseen by the Directive 2018/2001/EU.	60,000,000.00	571,429.00	2025-2030	Grant	Mitigation	1	Increase share of RES in transport The implementation of renewable energy technologies will reduce dependence on energy imports and increase the use of domestic energy sources.	The entity responsible for implementation of the activity: MoME including MAFWM for measure MP_D40.
Transport	NECP MP_D34 Development of the required infrastructure for recharging electric vehicles	Investment and regulatory measures will facilitate the adoption of the legislative framework for the promotion of electromobility. Moreover, the design and deployment of the required infrastructure for charging electric vehicles will be carried out with the provision of economic support for the installation of public chargers. Potential incentives will be explored to boost the consumption of RES in electromobility during the deployment of the required recharging infrastructure. The cost of this measure refers only to the installation of chargers and not to the possible needs for strengthening the distribution network in order to accommodate these chargers.	10,200,000,000.00	97,142,857.00	2025-2030	Grant	Mitigation	0	6,8 thousand installed public chargers. The promoted electric vehicles will also lead to savings in final and primary energy, contributing to the achievement of relevant goals. The implementation of renewable energy technologies will reduce dependence on energy imports and increase the use of domestic energy sources.	The entity responsible for implementation of the activity: MCTI
Cross-cutting	NECP MP_D38 Supporting demonstration projects for the promotion of biomethane and renewable hydrogen	Investment measure will finance the design and implementation of demonstration projects for the production and utilization of biomethane and renewable hydrogen so as to be consumed in all end-use sectors contributing to the meaningful reduction of their production cost and improving their technical feasibility in regard to Hydrogen and biomethane transportation with the existing natural gas network.	4,200,000,000.00	40,000,000.00	2025-2030	Grant	Mitigation	1	87 ктое of biomethane Increase share of RES in electricity, increase share of RES in heating and cooling and increase share of RES in transport, thereby contributing to the expected share of biofuels, bioliquids, and biomass.	The entity responsible for implementation of the activity: MoME
Cross-cutting	NECP MP_D39 Development of the required legislative framework and the required infrastructure for the deployment of biomethane and renewable hydrogen	This measure envisages the adoption of the legislative framework (e.g., licensing, technical guidelines) and facilitation of the deployment of the required infrastructure for allowing the use and consumption of biomethane and renewable hydrogen in the end-use sectors. The construction of dedicated infrastructures for large-scale storage and transportation of pure hydrogen, going beyond point-to-point pipelines within industrial clusters, will be explored	96,000,000.00	914,286.00	2025-2030	Grant	Mitigation	0	Increase share of RES in electricity, in heating and cooling and in transport, thereby contributing to the expected share of biofuels, bioliquids, and biomass.	The entity responsible for implementation of the activity: MoME
Cross-cutting	NECP MP_Д42 Carrying out information and training activities to all to all relevant actors for the use of RES	This reform measure will promote the implementation of information, training programmes to inform citizens of how to exercise their rights as active customers, and of the benefits and practicalities of using RES, including producing energy for self-consumption. Guidelines will be available to all relevant actors focusing on planners and architects, to consider the optimal usage RES in planning and construction. Emphasis will be places on improving the social acceptance of the renewable energy sources for electricity production.	24,000,000.00	228,571.00	2025-2030	Grant	Mitigation	0	Increase share of RES in electricity, in heating and cooling and in transport, thereby contributing to the savings in primary energy, contributing to the achievement of relevant goals. It will reduce dependence on energy imports and increase the use of domestic energy sources.	The entity responsible for implementation of the activity: MoME

Sector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected timeframe	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Expected use, impact and estimated results	Additional information
			Domestic currency (RSD)	USD						
Energy	NECP MP_EE1 Financial support for energy rehabilitation of residential buildings	Investment measure will provide subsidies for the energy renovation of the existing residential buildings through the rehabilitation of the building envelope and technical systems attaining the optimum cost-effectiveness ratio and increasing the share of the own funds, which will be utilized. Emphasis will be given to the promotion of heat pumps through specialized actions. Additional financial and fiscal measures will be initiated in the case that the contribution of the planned subsidies is not sufficient. Indicative budget include measure: NECP MP_D30 Provision of fiscal and economic incentives to foster RES in heating and cooling, that will provide incentives for the cost-effective support of renewable energy technologies for heating and cooling according to the provisions of Articles 71 and 74 of the Law on the use of renewable energy sources. The active role of the local self-governments, which are also responsible for the implementation of incentive measures, will be enabled. Also, Indicative budget include measure: NECP MP_EE5 Financial support for the construction and energy renovation of buildings exceeding minimum energy requirements. The potential use of low-carbon construction materials will be examined facilitating the transformation of the buildings into zero-emission buildings for their whole life-cycle	205,320,000,000.00	1,955,428,571.00	2025-2030	Grant Concessional loan The possibility of applying the ESCO financing model	Cross-cutting	0	131 thousand energy-renovated residential buildings (final energy savings 35 ktoe) 14.3 million m2 of energy-renovated residential buildings 2 GWth new capacity of heat pumps (final energy savings 34 ktoe) The achieved energy savings will reduce the consumption of fossil fuels, leading to a decrease in GHG emissions and a reduction in dependence on energy imports. 1476 ktoe of biomass, 4 ktoe of geothermal energy, 25 ktoe of solar thermal energy and 145 ktoe of ambient heat. Increase share of RES in in heating and cooling and promoting RES technology thereby contributing to the savings in primary energy. Applying RES technology will reduce dependence on energy imports and increase the use of domestic energy sources.	The entity responsible for implementation of the activity: Ministry of Finance, MoME, EE Directorate, MCTI
Energy	NECP MP_EE2 Financial support for the energy renovation of public buildings	Investment measure will promote the energy renovation of public buildings. The most cost-effective interventions will be supported for the rehabilitation of the building envelope and technical systems attaining the optimum cost-effectiveness ratio as prioritized within the framework of the energy management systems, which will be developed by the responsible authorities in accordance with the Law on Energy Efficiency and Rational Use of Energy. The achievement of the target for the energy renovation of buildings owned and used by the central administration (central government buildings – CGB) of 3% annually will be achieved with the most cost-effective approach. Indicative budget include measure: NECP MP_EE5: Financial support for the construction and energy renovation of buildings exceeding minimum energy requirements. The potential use of low-carbon construction materials will be examined facilitating the transformation of the buildings into zero-emission buildings for their whole life-cycle	121,920,000,000.00	1,161,142,857.00	2025-2030	Grant The possibility of applying the ESCO financing model	Cross-cutting	0	1,206 thousand m2 energy-renovated public buildings (final energy savings 5 ktoe delivered by interventions in the building envelope). 1.3 GWth new capacity of heat pumps (final energy savings 27 ktoe) The achieved energy savings will reduce fossil fuel consumption, leading to a decrease in GHG emissions and a reduction in dependence on energy imports.	The entity responsible for implementation of the activity: Ministry of Finance, MoME, EE Directorate, MCTI, Ministry for Public Investments, Provincial Secretariat of Vojvodina for Energy, Construction and Transport ,

Sector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected timeframe	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Expected use, impact and estimated results	Additional information
			Domestic currency (RSD)	USD						
Cross-cutting	NECP MP_EE3 Financial support for the energy renovation of non-residential buildings (not public)	Investment measure will foresee the provision of subsidies for the energy renovation of non-residential buildings, with the exemption of public buildings, emphasising on the reduction of the heating and cooling demand in the service sector. The design and provision of dedicated financial incentives will enable more extensive energy rehabilitation of non-residential buildings through cost-optimal interventions to improve the energy efficiency of buildings and technical systems with the highest potential for energy savings. Additional financial and fiscal measures will be initiated, such as the adoption of targeted tax deductions and the unhampered access to the required funds through credit lines, guarantees and soft-interest loans in the case that the contribution of the planned subsidies is not sufficient. Indicative budget include measure: NECP MP_EE5: Financial support for the construction and energy renovation of buildings exceeding minimum energy requirements. The potential use of low-carbon construction materials will be examined facilitating the transformation of the buildings into zero-emission buildings for their whole life-cycle	192,120,000,000.00	1,829,714,286.00	2025-2030	Grant Concessional loan The possibility of applying the ESCO financing model.	Cross-cutting	0	7,681 thousand m2 energy-renovated non-residential buildings (final energy savings 32 ktoe delivered by interventions in the building envelope) 3.8 GWth new capacity of heat pumps (final energy savings 25 ktoe) The achieved energy savings will reduce fossil fuel consumption, leading to a decrease in GHG emissions and a reduction in dependence on energy imports.	The entity responsible for implementation of the activity: Ministry of Finance, MoME, EE Directorate, MCTI
Cross-cutting	NECP MP_EE6 Installation of solar thermal systems in new buildings and in buildings undergoing extensive energy renovation	Investment measure will facilitate the installation of solar thermal systems in new buildings and those undergoing major renovation, as defined in Directive 2010/31/EU, facilitating simultaneously the further deployment of renewable energy. The planned measure will also be used to combat energy poverty.	76,440,000,000.00	728,000,000.00	2027-2030	Grant	Cross-cutting	0	1.8 GW capacity of solar thermal systems (primary energy savings 41 ktoe) The achieved energy savings will reduce fossil fuel consumption, leading to a decrease in GHG emissions and a reduction in dependence on energy imports.	The entity responsible for implementation of the activity: MoME, EE Directorate,
Transport	NECP MP_EE12 Financing programs for the promotion of energy efficiency passenger vehicles	Investment measure will provide subsidies for the purchase of energy efficient passenger vehicles in order to replace conventional ones in the case that the fiscal measures are not sufficient for the fulfilment of the established targets. The provided subsidies will be considered as eligible the vehicles that consume alternative fuels. Indicative budget include investment measure: NECP MP_EE19: Development of sustainable regional or municipal mobility plans, that way leading to the completion of the holistic framework for the implementation of the above-mentioned measures at local and regional level, taking into consideration the local characteristics and the design elements from all the above-mentioned measures as well as the existing spatial planning requirements according to the legislative framework.	68,400,000,000.00	651,428,571.00	2025-2030	Grant	Mitigation	0	20.5 thousand electric vehicles (final energy savings 9 ktoe) The achieved energy savings will reduce fossil fuel consumption, leading to a decrease in GHG emissions and the promoted electric vehicles will increase the share of renewable energy sources in transport. The achieved energy savings will reduce fossil fuel consumption, leading to a decrease in GHG emissions and a reduction in dependence on energy imports.	The entity responsible for implementation of the activity: MoME and MoEP For measure EE19: The entity responsible for implementation of the activity: MoME and LSG units

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Transport	NECP MP_EE14 Promotion of energy efficiency of the freight transport	Investment measure will foster the promotion of energy efficiency of the freight transport with various initiatives, such as the replacement of the conventional light-duty and heavy-duty vehicles with new more energy efficient and the facilitation of the freight transport through specialized taxation measures. A specialized action plan will be prepared identifying the most effective activities, while special focus will be given on how the logistics sector will become more sustainable Indicative budget include investment measure: NECP MP_EE13: Development of the required infrastructure for the promotion of alternative fuels, in accordance with the provisions of Directive 2014/94/EU. Especially for the case of electromobility, an electrification action plan for passenger and freight transport, roads and infrastructure will be compiled, emphasizing also the development of the legal framework and the exploitation of various financial instruments. . Indicative budget includes reform measure: NECP MP_D35: Provision of fiscal and economic incentives to foster the further deployment of electric vehicles, focusing on energy-intensive categories, such as taxies, light-duty vehicles etc. The planned incentives will be distinguished for the acquisition and the operation of electric vehicles Indicative budget include investment measure: NECP MP_EE19: Development of sustainable regional or municipal mobility plans, leading to the completion of the holistic framework for the implementation of the above-mentioned measures at local and regional level, taking into consideration the local characteristics and the design elements from all the above-mentioned measures as well as the existing spatial planning requirements according to the legislative framework.	79,800,000,000.00	760,000,000.00	2025-2030	Grant	Mitigation	0	21.1 thousand electric LD vehicles (final energy savings 25 ktoe) Electric vehicles will lead to savings in final and primary energy, contributing to the achievement of relevant goals. The implementation of renewable energy technologies will reduce dependence on energy imports and increase the use of domestic energy sources.	The entity responsible for implementation of the activity: MoME MCTI, Ministry of Finance EE19: The entity responsible for implementation of the activity: MoME and LSG units
Industry	NECP MP_EE21 Support schemes for the promotion of energy efficiency in the industrial sector	Investment measure will initiate a targeted support scheme for the implementation of energy efficiency projects in the industrial sector by combining various financial and fiscal instruments, such as direct financial support, low-interest loans, tax deductions, credit lines and guarantees The implementation measure is linked also with mandatory implementation of energy audits and development of energy management systems in order to identify the most cost-effective energy efficiency interventions which would enable economic support. Indicative budget include measure: NECP MP_EE22 Regulatory measures for the promotion of energy efficiency in the industrial sector, will facilitate the further deployment of the best available technologies in compliance with the respective legislation (Industrial Emission Directive), while the development of the appropriate monitoring and surveillance mechanism will be considered as a vital prerequisite for the implementation of the measure. Moreover, the application of the eco-design requirements will ensure the penetration of energy efficient technologies and equipment	403,920,000,000.00	3,846,857,143.00	2025-2030	Grant	Mitigation	1	The achieved energy savings will reduce fossil fuel consumption, leading to a decrease in GHG emissions. The achieved energy savings will reduce fossil fuel import and consumption, leading to reduction in dependence on energy imports.	The entity responsible for implementation of the activity: MoME Ministry of Economy, Ministry of Finance For measure EE22: The entity responsible for implementation of the activity: MoME and MoEP
Energy	NECP MP_EE34 Regulatory measures and financing programs for promoting/modernizing high efficient CHP units and district heating/cooling networks	Investment and reform measure will launch financial programs for the installation of new and the modernization of existing high efficient CHP units and district heating/cooling networks. In the case of the new highly efficient CHP units, planned incentives will be carried out in alignment with the Law on Energy Efficiency and Rational Use of Energy. Emphasis will be placed on exploiting waste heat mainly by the industrial activities in the materialised high efficient CHP units and district heating/cooling networks. The foreseen investments will be designed in conjunction with the respective one within the framework of PM_EE23	4,200,000,000.00	40,000,000.00	2025-2030	Grant	Mitigation	1	23 MW (Electricity output: 31 ktoe, Heat output for district heating: 6 ktoe, Industrial heat output: 13 ktoe)	The entity responsible for implementation of the activity: MoME, EE Directorate LSG units, Heating plants

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Energy	NECP MP_IEM9 Investments related to the digitalisation of the networks aiming at increasing RES integration and improvement of quality of supply	Investment measure refers to a policy- and financially-backed programme with the aim to promote smart grids and in particular prioritise the application of IEC 61850, the designation of sensing points and forecasting tools for demand and RES forecasting at mid and short-term time scales, the monitoring of quality of supply parameters (sags, swells, etc), as well as, the dynamic line rating for lines and cabling at important nodes to the system. These measures are expected to improve the observability of dynamic phenomena and improve the forecasting accuracy by the network operators. In addition, the measure envisages the installation of DLR and FACTS devices on the transmission network in parts that are considered to allow greater flexibility in the integration of renewable sources.	1,200,000,000.00	11,428,571.00	2026-2030	Grant	Mitigation	1	Increased system flexibility and quality of electricity supply, in particular through policies and measures related to market-based price formation in compliance with applicable law; market integration and coupling, aiming to increase the tradeable capacity of existing interconnectors, smart grids, aggregation, demand response, storage, distributed generation, mechanisms for dispatching, re-dispatching and curtailment and real-time price signals. This also includes the improvement of cybersecurity and resilience in the energy sector.	The entity responsible for implementation of the activity: MoME JSC "Elektromreza Srbije" Elektrodistribucija Srbije ltd. Belgrade

Table III.11

Information on capacity-building support received by Republic of Serbia under Article 11 of the Paris Agreement

Exchange rate used:105 RSD: 1 USD

Title of activity, programme, project or other	Programme/ project description	*Channel*	Recipient entity	Implementing entity	Amount received *(climate-specific)*		Time Frame	Financial Instrument	Status	Type of Support	Sector	Contribution to technology development and transfer objectives	Status of activity	Use, impact and estimated results	Additional Information
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Removing Barriers to Promote and Support the Energy Management System in Municipalities in Serbia (EMIS 1)	To increase investments in energy efficiency in public buildings and utility services within the competences of municipalities in order to improve their energy and cost efficiency through: • Development of legal, regulatory and institutional framework related to energy efficiency • Co-financing of at least 10 demonstration energy efficiency projects in public buildings / utility services on the basis of public call to units of LSG • Raising public awareness regarding energy efficiency	GEF and UNDP	MoME	UNDP	262,500,000.00	2,500,000.00	2015-2021	Grant	Received	Mitigation	Energy	1	Completed	It is expected that this intervention will lead to a reduction in energy consumption and CO2 emissions.	
Contribution of Sustainable Forest Management to a Low Emission and Resilient Development	Contribute to the conservation of biodiversity and climate change mitigation through the promotion of multifunctional sustainable forest management in productive forest landscapes through the following: Improved decision making in management of productive forest landscapes Institutional capacities strengthened for multifunctional forest management Increased forest area under sustainable and multifunctional forest management Adaptive management ensured and key lessons shared	GEF and UN FAO	MAFWM	FAO	376,503,750.00	3,585,750.00	2017-2020	Grant	Received	Mitigation	Forestry	0	Completed	CCM consideration reflected in sectoral documents and action plans, as well as forest development and forest management plans under implementation. Strong standardized measurements processes established and implemented through NFI; reporting is widely available in multiple formats, improved capacities of forest managers and institutions; State Forests (PE Srbjasume/Voivodinasume, National Parks Tara and Fruska Gora): 18,000 ha; Church Forests and Private Forests: 2,000 ha; Total: 20,000 ha in addition to baseline.	

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Second Biennial Update Report and Third National Communication under the UNFCCC	Support the Government of the Republic of Serbia to prepare its Second Biennial Update Report and Third National Communication under the UNFCCC	GEF	MoEP	UNDP	98,910,000.00	942,000.00	2017-2022	Grant	Received	Cross- cutting	Cross-cutting	0	Completed	Second Biennial Update Report and Third National Communication under the UNFCCC	
Energy Efficiency in Public Buildings - Education Facilities: Extended TA Support for the Implementation and Management of the Project	The funds will be used to identify necessary civil works rehabilitation measures that need to be implemented prior to the EE measures, elaborate demand-based energy audits of schools ("Energy Audits"), propose the selection of schools according to agreed criteria, define additional measures to improve the learning environment of the pupils, define adequate packages of rehabilitation measures ("Investment Plans"); elaborate technical design documents (final design and design review), prepare tender documents and guide the tender procedures for supply and works contracts; supervise construction works and final acceptance, and organise and implement capacity development programme for school and municipal staff responsible for the operation and maintenance of technical equipment.	KfW	Ministry of Education		94,080,000.00	896,000.00	2017 -2027	Grant	Received	Mitigation	Energy	0	Ongoing	It is expected that this intervention will lead to a reduction in energy consumption and CO2 emissions for at least 20%, increased comfort of building usage, and better learning and teaching conditions.	
Climate Smart Urban Development Challenge	The objective of this project to identify and promote climate-smart solutions for mitigating climate change at the local level in the Republic of Serbia. To do so, the Project formulates Challenges for identification and support of different ICT, technological solutions and business ideas that can be applied at the level of local self-governments to increase the share of “climate proof” public services. A call for ideas was open for local self-governments, business sector, research and scientific community, CSO etc.	GEF	MoEP	UNDP	365,227,380.00	3,478,356.00	2017-2023	Grant	Received	Cross- cutting	Cross-cutting	1	Completed	Enhancing capacities for combating climate change and managing natural resources. Communities are more resilient to the impacts of natural disasters and human-induced catastrophes.	

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Enhancing Environmental Performance and Climate Proofing of Infrastructure Investments in the Western Balkan Region from an EU integration perspective (ClimaProof)	The long-term objective of ClimaProof was to contribute to the reduction of climate change risks in the Western Balkan (WB) region while raising awareness, strengthening capacities and creating an enabling environment for investment in green infrastructure. The project aimed to improve the technical capacities of the Western Balkans (WB) in climate proofing their investments in the road infrastructure while developing national and international frameworks through integration of EU best practices.	Austrian Development Agency (ADC)	MoEP MCTI Republic Hydrometeorological Service of Serbia (Regional project)	UNEP	199,738,875.00	1,902,275.00	2017-2021	Grant	Received	Adaptation	Cross-cutting	0	Completed	Key project results include 1) high resolution, localised, bias corrected scenarios for the whole target region with an easy to handle program for bias correction, 2) strengthened national capacities to integrate climate change projections, climate proofing and green infrastructure in infrastructure development on a national and regional level and 3) Regional strategy for climate resilient infrastructure development, followed with an action plan identifying concrete climate proofing measures, including green infrastructure.	
Developing the capacities of Serbia for an effective engagement with the Green Climate Fund (GCF)	The goal of the project was to assess the national capacities for the verification and approval of projects that would apply for funding from the GCF The project focused on (i): Strengthening country capacities in relation to the GCF, (ii) Engaging stakeholders in consultative processes and (iii) Realizing direct access.	GCF	MAFWM	UNEP	31,500,000.00	300,000.00	2018-2020	Grant	Received	Cross- cutting	Cross-cutting	0	Completed	As part of this project, the National Program of the Republic of Serbia for the Green Climate Fund until 2025 was developed, which defines the national project and program priorities for financing from the GCF funds.	
Development of the Biomass market in the Republic of Serbia (Component 1)	The program aims to introduce the use of renewable energy sources in selected heating plants in the Republic of Serbia for the production of thermal energy, transitioning from the use of fossil fuels to the use of biomass (wood chips) and geothermal energy sources.	SECO, Government of Germany and KfW bank	District heating plants	MoME	3,142,949,747.70	29,932,855 Grant amount SECO 4.750.000 EUR; Grant of Gov of Germany 2.000.000 EUR; Concessional loan KfW bank 20.000.000 EUR with 1,1% Annual interest rate	2018-2024	Concessional loan and Grant	Received	Mitigation	Energy	1	Completed	The investment resulted in a reduction of CO2 emissions by 88% and SO2 emissions by 99%. The share of renewable energy sources in the total fuel consumption reached 90%.	With the support of the program, four biomass heating plants were built in the cities of: Priboj, Mali Zvornik, Novi Pazar, and Majdanpek.

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Establishment of Transparency Framework for the Republic of Serbia (the CBIT)	The goal of the project is to support the Republic of Serbia in establishing a national transparency framework in accordance with the provisions of the Paris Agreement. The main goal is finalization and launching of a monitoring, reporting, and verification (MRV) system for the collection of information relevant to climate change, in line with the Climate Change Law, that could provide more accurate information and analysis of the instruments that the country selects to mitigate and adapt to climate change.	GEF Government of Austria UNDP	MoEP	UNDP	152,700,030.00	1,454,286.00	2019-2022	Grant	Received	Cross- cutting	Cross-cutting	0	Completed	3 Action Plans for Climate Change Adaptation for Kraljevo, Ub, and Zrenjanin Improved quality of the GHG inventory; NDC revised; The project ensured Serbia's participation in the global initiative „Climate Promise"; A system for monitoring, reporting, and verification (MRV) in the field of climate change has been established, including an MRV-IT tool that supports higher-quality and more timely reports to the UNFCCC, as well as better and more active involvement of all institutions in tracking and reporting on the NDC.	
TRATOLOW (Transition towards low emissions and climate-resilient economy in the Western Balkans and Türkiye)	Overall objective is to contribute to climate change mitigation and adaptation and the development towards a resource-efficient, low emissions and climate-resilient economy in the Western Balkans and Türkiye.	Regional: EU funded	MoEP And MoME	Umweltbundesamt and NIRAS			2020-2024	Grant	Received	Cross- cutting		0	Ongoing	To support the beneficiaries to develop their capacities for the implementation of the 2015 Paris Agreement, the transition to low-emission and climate resilient economies and to enhance the regional exchange of information, best practices, peer reviews, experience and awareness-raising campaigns.	
Strengthening Serbia's capacities for strategic engagement of private sector into climate financing	The goal of the project was to improve the tool/instrument, specifically the matrix for assessing and prioritizing project proposals and project ideas for financing from the Green Climate Fund (GCF), as well as for their inclusion in the National Program. Additionally, the aim was to recognize the importance and benefits of private sector investments in combating climate change and to establish direct cooperation with the GCF (currently only possible through international accredited agencies) to make both state and private sector investments more significant and sustainable.	*GCF*	MAFWM	FAO	58,837,485.00	560,357.00	2020-2022	Grant	Received	Cross- cutting	Cross-cutting	0	Completed		

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European Union for Civil Protection and Disaster Resilience Strengthening in the Republic of Serbia	To contribute to reducing vulnerability to disasters and to increase the country's resilience to climate change. Focus is on the following: • Improving capacities at the national and local level for preparedness and response in case of accidents and disasters through upgrading infrastructural and human capacities, • Improving the institutional coordination at the horizontal and vertical level, upgrading technical and operational capacities, • Contributing to advanced cooperation across sectors and enabling a faster, better coordinated and more effective response to natural and man-made disasters.	EU		UNDP	1,973,103,615.00	18,791,463.00	2020-2024		Received	Adaptation	Cross-cutting	0	Ongoing	Infrastructural upgrades Procurement of the equipment Capacity building activities	
Strengthening Disaster Resilience in Agriculture	Expected results of the project are: • Institutional and capacity gap assessment in the Ministry of Agriculture, Forestry and Water Management in Disaster Risk Reduction/Management and Climate Smart Agriculture • Support for agricultural expert services in disaster risk reduction and climate-resilient agriculture • Support for the agricultural education system in the field of climate change • Establishment of demonstration fields for the application of climate-resilient agriculture principles • Training for farmers in disaster risk reduction and climate-resilient agriculture	EU	MAFWM	FAO	292,818,663.90	2,788,749.18	2020-2026		Received	Adaptation	Agriculture	1	Ongoing	It is of great importance for adaptation to climate change.	Implemented entity: MAFWM, Agricultural Advisory Service
Rehabilitation of the district heating system in Serbia – Phase V	Rehabilitation of the district heating system in Belgrade, Bor, Jagodina, Leskovac, Negotin, Niš, and Senta. Goal: Increase energy efficiency and reduce harmful gas emissions.	Government of Germany through KfW	Direct borrowing of the Republic of Serbia – the right to use transferred to the participating heating plants.	MoME	3,759,790,352.85	Total 35,807,527 Loan: 33,569,557 Grant: 2,237,970	2020-2026	Concessional loan and Grant	Received	Mitigation	Energy	1	Ongoing	Estimated results: A 15% increase in energy efficiency in the rehabilitated parts of the system, and a reduction in CO_2 emissions by 70,000 tons per year.	

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Energy efficiency in public buildings and renewable energy sources in the district heating sector ("Greening the public sector") - Renovation of the VMA hospital, Phase 1A	The project for the rehabilitation of the Military Medical Academy (VMA) includes the implementation of energy efficiency measures on the building's thermal envelope, technical systems for air conditioning, heating, and cooling, as well as the preparation of sanitary hot water using renewable energy sources. It also includes measures aimed at improving the functionality of the hospital.	KfW and EU WBIF	MoME	PMO Consultant–M4H Gmbh – Frankfurt, Federal Republic of Germany, and the Project Implementation Unit. (members MoME, Ministry of Defense and VMA)	587,467,242.60	5,594,926.12	2020 –2028	Grant	Received	Mitigation	Energy	1	Ongoing	It is expected that this intervention will lead to a reduction in energy consumption and CO2 emissions	
Green Transition – Implementing Industrial Emissions Directive in Serbia 2021-2025	To produce Directive Specific Implementation Plan for the implementation of the EU ETS Directive as well as analysis of the alignment of national legislation with EU ETS Directive and administrative plan for the full transposition of the Directive	SIDA	MoEP	TMF	259,253,505.00	2,469,081.00	2021-2026	Grant	Received	Mitigation	Cross-cutting	0	Ongoing	Directive Specific Implementation Plan for the implementation of the EU ETS Directive will contribute more efficient mobilization of funds for combating climate change.	
Green Agenda for Serbia	To contribute to the efficient, inclusive and sustainable implementation of the Green Agenda in Serbia by: improving the strategic and legislative framework, co-financing implementation of innovative pilot projects and mobilizing additional financing for scale-up investments. In this way, the project will contribute to the green transformation of economy and society in Serbia.	EU - IPA 2020 Embassy of Sweden EIB with additional funding from the Governments of Sweden, Switzerland and Serbia	MoEP	UNDP	540,474,480.00	5,147,376.00	2021-2024	Grant	Received	Cross- cutting	Cross-cutting	1	Ongoing	1. Support to MEP on establishment of MRVA in Serbia in accordance with Law on Climate Change 2. Based on the legal framework for GHG emissions permitting requirements the activity will support capacity building for MEP and SEPA regarding implementation of the newly established permitting requirements. 3. Development of an IT system/software for issuance of GHG emission permits. 4. Capacity building of operators on their legal obligations on preparing proper GHG monitoring plans, GHG emission reports and to apply for the GHG Permit. socio-economic benefits and prepare for compliance. 5. Selection of up to 10 EU ETS operators and up to 10 public and private entities from non-ETS sectors and assisting them in identification of best technologies for lowering their carbon intensity	

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Cities and Climate Change Program	AFD is implementing a budgetary funding and technical supports to accompany and accelerate the implementation of the Serbian government's climate roadmap over the coming years, in coordination with the World Bank.	AFD	Republic of Serbia	/	5,874,672,405.00	55,949,261.00	2021-	Concessional loan	Received	Cross- cutting	Cross-cutting	0	Ongoing	The program will make a structural contribution to Serbia's low-carbon pathway through its action to unlock the adoption and implementation of climate legislation, which is a prerequisite for the effectiveness of all other change mechanisms: engagement of public actors, monitoring of greenhouse gas emissions, report preparation, and mobilization of climate finance.	
Improvement of forest management in Serbia as a contribution to climate change adaptation and mitigation	The purpose is to strengthen the capacities of the forestry sector in Serbia and so assist the Serbian partners to further harmonise regulations and implement obligations stemming from EU regulations and standards in forestry and related fields, including timber market, Forest Information System, subsidies, Natura 2000 nature protection network and use of wood and other forest products in the bioeconomy.	EU Funding – IPA	MAFWM	Twinning Project Consortium of Austria and Slovakia	117,493,425.00	1,118,985.00	2021 -2023	Grant	Received	Cross- cutting	Forestry	0	Completed	Policy and administrative capacities in the forestry sector of Serbia assessed and improved. The system of subsidies in the forestry sector assessed and improved. Timber trade system legislation harmonised with EU requirements. The project will contribute to climate change adaptation and mitigation in forestry, entirely in accordance with the European Green Deal.	
Energy Efficiency in Central Government Buildings	The project covers the improvement of energy efficiency in 26 out of a total of 56 central government buildings (CGS). These central government buildings will undergo energy renovations through the reconstruction of the thermal envelope (replacement of windows and installation of insulation), reconstruction of the heating system, reconstruction of the cooling and ventilation systems in buildings where they exist, and the installation of energy-efficient indoor lighting, resulting in an energy savings of approximately 30% in these buildings. To date, funding for the project has been secured through a loan of 40 million euros and a grant of 1.02 million euros.	CEB, WBiF, SIGA, SCA, UNDP through Resource Mobilization Facility (RMF) trust fund of Slovakia	MoME	UNDP	4,819,581,270.00	45,900,774	2021-2025	Grant and Loan	Received	Mitigation	Energy	1	Ongoing	A reduction in primary energy consumption by at least 30%, a reduction in CO2 emissions by approximately 20%, and savings of about 29% in energy operating costs. Additionally, the program is expected to improve working conditions and contribute to the protection and preservation of cultural heritage.	

Title of activity, programme, project or other	Programme/ project description	*Channel*	Recipient entity	Implementing entity	Amount received *(climate-specific)*		Time Frame	Financial Instrument	Status	Type of Support	Sector	Contribution to technology development and transfer objectives	Status of activity	Use, impact and estimated results	Additional Information
					Domestic currency (RSD)	USD									
Improvement of the energy management system to increase investments in energy efficiency in public buildings in Serbia	Further development of the energy management system, particularly in areas related to energy audits and the training system for energy advisors, as support for the implementation of the Energy Efficiency and Rational Use of Energy Act through: Improving energy efficiency and promoting the use of renewable energy sources in public buildings, with a special focus on buildings owned by the state. Supporting the incentive framework for policy and building local capacities for conducting energy audits. Contributing to the adoption of the Energy Management Information System (EMIS). Energy management in at least 80 new state-owned buildings. Supporting the renovation to improve energy efficiency in at least 28 buildings.	GEF/ UNDP	MoME	MoME	158,025,000.00	Total: 1,505,000.00 GEF 1.405.000 USD UNDP 100.000 USD	2021-2026	Grant	Received	Mitigation	Energy	0	Ongoing	It is expected that this intervention will lead to a reduction in energy consumption and CO2 emissions, around 145,000 tons CO_{2eq} during the 25-year lifecycle of the investment.	
Enabling environment at policy, field and market levels for Forest Landscape Restoration (FLR) to achieve Land Degradation Neutrality (LDN) in Serbia	The goal of the project is to promote and implement good practices for forest restoration and stopping soil degradation in Serbia. Outcomes of the project: Enhanced capacity in FLR planning and implementation to achieve LDN FLR approaches selected for upscaling Monitoring and dissemination of lessons learned to support scaling up of FLR to the national level	GEF	MAFWM	FAO	78,739,500.00	749,900.00	2022 -2025	Grant	Received	Cross- cutting	Forestry	0	Ongoing	Capacity of FLR/LDN related institutions for LDN incorporation into legal framework increased and strengthened FLR approaches with potential for upscaling in both pilot regions tested 35,715 ha of forest in Dmitrovgrad under FMP 1,392 ha of forests in Zrenanjin under FMP Project delivers expected results and shares lessons learned	

Title of activity, programme, project or other	Programme/ project description	*Channel*	Recipient entity	Implementing entity	Amount received *(climate-specific)*		Time Frame	Financial Instrument	Status	Type of Support	Sector	Contribution to technology development and transfer objectives	Status of activity	Use, impact and estimated results	Additional Information
					Domestic currency (RSD)	USD									
Reducing the carbon footprint of local communities by applying the principles of the circular economy in the Republic of Serbia - Circular Communities	Project goal is Encouraging the development and supporting the implementation of circular ideas, business models and products of public and private companies, in order to reduce the carbon footprint of local communities in Serbia	GEF Republic of Sebia UNDP	MoEP	UNDP	305,922,225.00	2,913,545.00	2022 -2027	Grant	Received	Mitigation	Cross-cutting	1	Ongoing	Establish a supportive public policy and institutional framework aligned with EU circular economy policies, including training to improve the knowledge and skills of stakeholders, as well as encouraging broad community participation in the development and implementation of such policies; Establish a Low Carbon Communities Innovation Platform – LCCIP, in order to identify and support new business ideas, products, investments in the area of circular economy and efficient use of resources; Pilot investments in the area of circular economy; Spread knowledge and raise public awareness on the importance of circular economy.	

Title of activity, programme, project or other	Programme/ project description	*Channel*	Recipient entity	Implementing entity	Amount received *(climate-specific)*		Time Frame	Financial Instrument	Status	Type of Support	Sector	Contribution to technology development and transfer objectives	Status of activity	Use, impact and estimated results	Additional Information
					Domestic currency (RSD)	USD									
Just Green Transition and Decarbonisation in Serbia	Project goal is Contributing to the achievement of Serbia's Nationally Determined Contribution (NDC) targets of 33,3% compared to 1990 level by 2030. Project focus Facilitation of wide consultation process and comprehensive dialogues with all relevant stakeholders for strategic planning and implementation of fair green transition, resulting in respective socio-economic analysis, conclusions and roadmap on just green transition Supporting concrete investments for green technology projects and innovative business models	Government of Japan Swiss Agy for Development & Cooperation State Secretariat for Eco Affairs Republic of Serbia	MoME and MoEP	UNDP	511,982,310	4,876,022.00	2022-2023	Grant	Received	Mitigation	Cross-cutting	1	Completed	Project helped to identify and use technologies and innovative business models in sectors most affected by decarbonization, while ensuring the principles of a just transition are incorporated into it. 12,563 t/CO2 emissions reduced in the 1st year of implementation of 8 supported projects, with prospects of reaching a cumulative level of 230,147.82 t/CO2e in a 20-year horizon. 7,8 MW of RES installed 25 new green jobs created 38 representatives of public and private companies trained in Accelerator for decarbonisation and just transition 15 representatives of business and institutional stakeholders trained for KAIZEN management methodology 110 beneficiaries (workers, representatives of vulnerable groups etc.) trained for new jobs	Through the Innovation Challenge Call, the project co-financed 8 projects that contribute to achieving Serbia's NDC target in reducing the greenhouse gas emissions (GHG) emissions with 600.000 USD (around 6% of total investment value) and mobilized additional investments for these projects from corporate sector of approx. 10 million USD
Innovative and Just Green Transition as Tool for Securing Systemic Energy Security and Reducing Energy Poverty	Ensuring energy security for all, reducing energy poverty in Serbia and contributing to achieving of the Nationally Determined Contribution (NDC) targets	Government of Japan Republic of Serbia	MoME and MoEP	UNDP	121,172,100.00	1,154,020.00	2023-2024	Grant	Received	Mitigation	Cross-cutting	1	Completed	Support to collectively respond to the climate emergency and establish resilient development pathways for sustaining human security and green transformation	Project focus was on Supporting innovative solutions that reduce import dependency, diversify energy sources, reduce energy intensity of the economy or enable access to clean and affordable energy for vulnerable population. and Improvements of legal and policy system on just green transition and energy poverty.

Title of activity, programme, project or other	Programme/ project description	*Channel*	Recipient entity	Implementing entity	Amount received *(climate-specific)*		Time Frame	Financial Instrument	Status	Type of Support	Sector	Contribution to technology development and transfer objectives	Status of activity	Use, impact and estimated results	Additional Information
					Domestic currency (RSD)	USD									
Climate Proofing for Sustainable Development in the Western Balkans	The overall objective of this project is to establish a comprehensive knowledge and information base by development of a Western Balkan Climate-Proofing Platform (WB-CPP), tailored in terms of its content, featured methods, and tools provided and complementing other existing web-based platforms.	Austrian Development Agency (ADC)	MoEP Ministry of Toursim and Youth Protected Area managers	UNEP	232,660,291.50	2,215,812	2023 –2027	Grant	Received	Cross- cutting	Cross-cutting	0	Ongoing	Outcome I will provide general access to climate change knowledge, best practices and adaptation solutions by establishing a regional Western Balkans Climate-Proofing Platform (WB-CPP), which will be the key information base for evidence-based decision making. Outcome II will facilitate incorporation of climate considerations in planning and development processes through targeted stakeholder empowerment to apply climate-proofing principles and use the WB-CPP as well as piloting practical adaptation approaches in selected tourism destinations	
Partnership for Good Local Government	Program is to contribute to the development of decentralized public governance and accountable local governments which respect citizens' rights and provide sustainable services to all citizens. The quality and availability of local public services provided to the citizens and business by LSG will be improved in several areas of local-self-government competence: 1) administrative services; 2) economic development; 3) agriculture and rural development; 4) social development; 5) urbanism and spatial planning; 6) environmental protection; etc. The project improved Methodology for developing local adaptation plans to change climate conditions through a participatory process and intersectoral cooperation. Additionally, training was conducted to strengthen the capacity of Local Self-Governments (LSGs) for implementing climate change adaptation, including accredited training for LSG staff.	Swiss Government	MoEP and MCTI	SCTM and Swiss Agency for Development and Cooperation (SDC)	1,349,985.00	12,857.00	2023-2026		Received	Adaptation	Cross-cutting	0	Ongoing	The improved methodology for developing local adaptation plans to change climate conditions will contribute to increasing the resilience of urban areas to altered climate conditions by enhancing green infrastructure, in line with Measure 2.5 of the Action Plan of the Adaptation Program. Training for employees in LSGs has been conducted to increase capacity for adaptation to climate change, in accordance with Measure 3.3 of the Action Plan of the Adaptation Program (Supporting local government units in implementing climate change adaptation through strengthening green infrastructure).	

Title of activity, programme, project or other	Programme/ project description	*Channel*	Recipient entity	Implementing entity	Amount received *(climate-specific)*		Time Frame	Financial Instrument	Status	Type of Support	Sector	Contribution to technology development and transfer objectives	Status of activity	Use, impact and estimated results	Additional Information
					Domestic currency (RSD)	USD									
Clean energy and energy efficiency for citizens	The project will achieve energy savings through the implementation of energy rehabilitation of residential buildings, which will include the replacement of windows and doors, installation of insulation on roofs and walls, and replacement of heating systems, including the replacement of boilers and stoves, fuel change, and installation of solar collectors for heating sanitary hot water. The project will also promote the production of electricity from renewable energy sources by supporting the installation of solar panels in households.	World bank	MoME	MoME	5,275,455,838.80	50,242,437.56	2023-2027	Concessional loan	Received	Mitigation	Energy	1	Ongoing	This project is expected to lead to a reduction in energy consumption and CO2 emissions in the residential sector.	
Renewable District Energy Serbia - ReDE Serbia	The introduction of renewable energy sources (RES) into the district heating subsector will contribute to harnessing its vast potential in the process of decarbonizing Serbia. Phase 1 covers 14 investments in 10 cities across Serbia, through which renewable energy sources (mainly heat pumps, geothermal, and solar technologies) will be integrated into district heating systems. The program also includes institutional support from the EBRD. In this regard, it has been agreed between the Ministry of Mining and Energy (MOME) and EBRD that donor funds from EBRD will finance the development of several documents related to energy efficiency and the district heating subsector.	EBRD	MoME/LSG/ district heating plants	MoME	4,406,004,319.50	41,961,946.00	2024-2027	Concessional loan And Grant	Received	Mitigation	Energy	0	Ongoing	It is expected that this intervention will lead to an increase in the share of renewable energy sources in final energy consumption, a reduction in energy consumption, and a decrease in CO2 emissions.	
Energy renovation of residential, multi-family buildings connected to the district heating system – Public ESCO Project	The goal of the project is to improve energy efficiency in multi-family residential buildings connected to district heating systems and transition to billing based on heat energy consumption.	EBRD	MoME/LSG/ district heating plants / residential communities	MoME/LSG	7,578,327,429.75	72,174,547.00	2024-2027	Concessional loan and Grant	Committed	Mitigation	Energy	0	Planned	It is expected that this intervention will lead to a reduction in energy consumption and CO2 emissions	
The integration of renewable energy from solar thermal sources and heat pumps with a heat storage system into the district heating system in Novi Sad.	The integration of renewable energy produced from solar thermal sources and heat pumps into the district heating system of Novi Sad.	EBRD	City and district heating plant Novi Sad	MoME/ District heating plant Novi Sad	12,336,812,094.60	117,493,448.52	2024-2030	Concessional loan And Grant	Committed	Mitigation	Energy	0	Planned	It is expected that this intervention will lead to an increase in the share of renewable energy sources in final energy consumption, a reduction in energy consumption, and a decrease in CO2 emissions.	

Title of activity, programme, project or other	Programme/ project description	*Channel*	Recipient entity	Implementing entity	Amount received *(climate-specific)*		Time Frame	Financial Instrument	Status	Type of Support	Sector	Contribution to technology development and transfer objectives	Status of activity	Use, impact and estimated results	Additional Information
					Domestic currency (RSD)	USD									
Technical Assistance for Improvement of Climate Change Policy Framework	Improvement of climate change policy and legal framework, further development of capacities for implementation of climate change policy and legal framework and development of mechanisms for support of industry related to decarbonization	IPA 2021	MoEP				2024-2026	Grant	Committed	Cross- cutting	Cross-cutting	0	Planned	A Roadmap for further improvement of policy planning in the field of climate change will be developed, the legal and institutional frameworks will be enhanced, the capacities of national institutions will be strengthened, and Roadmaps for decarbonization will be prepared for at least four different ETS and/or non-ETS sectors.	
Development of the Biomass market in the Republic of Serbia (Component 2)	The program aims to introduce the use of renewable energy sources in selected heating plants in the Republic of Serbia for the production of thermal energy, transitioning from the use of fossil fuels to the use of biomass.	IPA 2018, WBIF, Government of Germany and KfW bank	District heating plants	MoME	3,748,041,007.20	35,695,628.64 Grant amount 11.900.000 EUR (IPA 2018: 900.000 EUR, WBIF 9.000.000 EUR and Gov of Germany 2.000.000 EUR; Concessional loan KfW bank 20.000.000 EUR	2025-2029	Concessional loan and Grant	Committed	Mitigation	Energy	1	Planned	Overall, the investment will lead to a 8% reduction in network losses; CO2 emissions will be 1,537 tons instead of 12,815 tons (reduced by 88%); SO2 emissions will be 0.8 tons instead of 78 tons (reduced by 99%); the billing for energy consumption will be based on actual usage, encouraging users to be more mindful of their energy consumption.	With the support of the program, investments will be made in heating plants in Majdanpek (primary heating pipeline for which there were no funds in the first phase), Novi Pazar (additional wood chip boiler), Vranje, Prijepolje, Rača, and Niš.
Enhancing the resilience of Serbian forests and the carbon storage potential of the country to support and boost the decarbonization process through adaptation and mitigation investments	The project aims to support the Republic of Serbia in enabling the forestry sector to contribute to the country's climate change adaptation and mitigation goals and support the most vulnerable households. This will be achieved by enhancing the management capacities of key institutions and communities, expanding ecosystem services to reduce poverty, encouraging private companies to decarbonize their processes, and simultaneously contributing to forest restoration, improved management, and the stabilization and increase of carbon removal.	GCF	MAFWM	FAO	10,815,004,830.00	103,000,046.00	2025-2028	Concessional loan and Grant Grant USD 25,000,000	Committed, prepared, waiting for approval	Cross- cutting	Forestry	0	Planned	Improvement of forest management and governance to ensure adaptation to climate change and the reduction of degradation factors. Increase in the contribution of forests to the energy security of vulnerable communities and carbon removal, while enhancing resilience through investments in climate change adaptation. Support for private sector engagement in forest management and "greening" the value chain of wood biomass. The combined impact of these actions will enable Serbia to reduce the vulnerability of its forestry sector and increase overall carbon dioxide removal, while simultaneously enhancing biodiversity and capitalizing on the role of forests in protecting and supporting the most vulnerable communities.	

Table III.12

Information on support needed by the Republic of Sebia for the implementation of Article 13 of the Paris Agreement and transparency-related activities, including for transparency-related capacity-building

Exchange rate used:105 RSD: 1 USD

Sector	Subsector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected time frame	Expected financial instrument	Type of support	Contribution to technology development and transfer objectives	Contribution to capacity- building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
				Domestic currency (RSD)	USD								
Cross-cutting		Further support for the establishment of a transparency framework in the Republic of Serbia (CBIT 2)	The aim of the project is to support the Republic of Serbia in establishing a national transparency framework in accordance with the provisions of the Paris Agreement	228,900,000	2,180,000	2025 -	GEF	Cross-cutting	0	1	1	The project is a continuation of the project implemented during the period 2019-2022 and directly contributes to strategic objectives in the field of climate change.	Beneficiary: MoEP Implementation: UNDP UNDP submitted a request for the second phase of the project. The application evaluation is in progress.
Cross-cutting		Continuation of Advancing Medium and Long-Term Adaptation Planning for Climate Change in the Republic of Serbia (NAP 2)	The aim of the project is to support the Republic of Serbia in monitoring the implementation of adaptation measures and actions.	94,500,000	900,000.00	2025 -	GEF	Adaptation	0	1	1	The project is a continuation of the project implemented during the period 2019-2023 and directly contributes to strategic objectives in the field of climate change.	Beneficiary: MAFWM and MoEP Implementation: UNDP UNDP submitted a request for the second phase of the project to GCF. The application evaluation is in progress.
Agriculture		ACTION PLAN OF CLIMATE CHANGE ADAPTATION PROGRAM: MEASURE 3.1. Optimizing irrigation in line with needs and resources	Activity 3.1.1 Preparing assessment of needs for artificial water reservoirs and atmospheric water reception and storage capacities (including micro-reservoirs) to assess the possibility for reservoirs construction and costs, for agricultural crop irrigation purposes	6,000,000.00	57,143.00	by 2026	Grant	Adaptation	0	1	1	Study on needs for artificial water reservoirs and atmospheric water reception and storage capacities will contribute to climate change adaptation.	The entity responsible for implementation of the activity: MAFWM in collaboration with MoEP, universities and other scientific institutions
Cross-cutting		NECP MP_D2: Monitoring the implementation of the Low Carbon Development Strategy of the Republic of Serbia for the period 2023-2030, with projections until 2050, and the Program for Adaptation to Changed Climate Conditions for the period 2023 to 2030	Facilitate the process of monitoring and revision of the adopted Low-Carbon Development Strategy as well as implementation of Program of adaptation to changed climate conditions with Action Plan.	168,000,000.00	1,600,000.00	2023-2030	Grant	Cross-cutting	0	1	1	Reducing GHG emissions and increasing resilience to climate change. Contribution to the objective of reduction of GHG emissions by 33.3% (without LULUCF) by 2030 compared to 1990 levels.	The entity responsible for implementation of the activity: MoEP

Table III.13

Information on support received by the Republic of Serbia for the implementation of Article 13 of the Paris Agreement and transparency-related activities, including for transparency-related capacity-building

Exchange rate used:105 RSD: 1 USD

Title of activity, programme, project or other	Programme/ project description	*Channel*	Recipient entity	Implementing entity	Amount received *(climate-specific)*		Time Frame	Financial Instrument	Status	Type of Support	Sector	Sub-Sector	Contribution to technology development and transfer objectives	Contribution to capacity- building Objectives	Status of activity	Use, impact and estimated results	Additional Information
					Domestic currency (RSD)	USD											
Second Biennial Update Report and Third National Communication under the UNFCCC	Support the Government of the Republic of Serbia to prepare its Second Biennial Update Report and Third National Communication under the UNFCCC	GEF	MoEP	UNDP	98,910,000.00	942,000.00	2017-2022	Grant	Received	Cross- cutting	Cross-cutting		0	1	Completed	Second Biennial Update Report and Third National Communication under the UNFCCC	
Establishment of Transparency Framework for the Republic of Serbia (the CBIT)	The goal of the project is to support the Republic of Serbia in establishing a national transparency framework in accordance with the provisions of the Paris Agreement. The main goal is finalization and launching of a monitoring, reporting, and verification (MRV) system for the collection of information relevant to climate change, in line with the Climate Change Law, that could provide more accurate information and analysis of the instruments that the country selects to mitigate and adapt to climate change.	GEF Government of Austria UNDP	MoEP	UNDP	152,700,030.00	1,454,286.00	2019-2022	Grant	Received	Cross- cutting	Cross-cutting		0	1	Completed	3 Action Plans for Climate Change Adaptation for Kraljevo, Ub, and Zrenjanin Improved quality of the GHG inventory; NDC revised; The project ensured Serbia's participation in the global initiative „Climate Promise"; A system for monitoring, reporting, and verification (MRV) in the field of climate change has been established, including an MRV-IT tool that supports higher-quality and more timely reports to the UNFCCC, as well as better and more active involvement of all institutions in tracking and reporting on the NDC.	
TRATOLOW (Transition towards low emissions and climate-resilient economy in the Western Balkans and Türkiye)	Overall objective is to contribute to climate change mitigation and adaptation and the development towards a resource-efficient, low emissions and climate-resilient economy in the Western Balkans and Türkiye.	Regional: EU funded	MoEP and MoME	Umweltbundesamt and NIRAS			2020-2024	Grant	Received	Cross- cutting			0	1	Ongoing	To support the beneficiaries to develop their capacities for the implementation of the 2015 Paris Agreement, the transition to low-emission and climate resilient economies and to enhance the regional exchange of information, best practices, peer reviews, experience and awareness-raising campaigns.	