

Nationally Determined Contribution (NDC) of the Republic of Serbia for the 2021–2030 period

Background

The Republic of Serbia has been Party to the United Nations Framework Convention on Climate Change (UNFCCC) since 2001 and to the Paris Agreement since 2017. In 2015, the Government of the Republic of Serbia submitted its Intended National Determined Contributions (INDCs), defining a 9.8% greenhouse gas emissions reduction by 2030 compared to base year emissions (1990). The first NDC also refers to losses and damages associated with extreme weather events and indicates the need to adapt to climate change.

The Republic of Serbia hereby communicates its updated Nationally Determined Contribution (NDC), in accordance with the Articles 3 and 4 of the Paris Agreement and paragraphs 22 and 24 of Decision 1 CP/21:

Increasing its ambition to the GHG emission reduction by 13.2% compared to 2010 level (i.e. 33,3% compared to 1990) by 2030, and

Taking into account that in the period 2015-2020 period, Serbia suffered damages estimated at EUR 1.8 billion, additional to EUR 5 billion in the period 2000-2015, caused by climate change and extreme weather events.

The Republic of Serbia has signed the Stabilisation and Association Agreement with the European Union in 2012. This Agreement entered into force in September 2013. Thus, the country has committed to aligning its legislation on climate change to the EU *acquis* that will significantly contribute to the greenhouse gas emission reduction. Serbia is a landlocked country. Energy is one of the largest sectors of the Serbian economy, and the most of the electricity is produced in thermoelectric power plants (about 70%) using domestic low-calorific lignite, while the rest comes mainly from hydropower. Electricity consumption is very high, mostly due to the use of electricity for heating and a very low level of energy efficiency.

The mean annual temperature increased in the period 2008-2017 relative to the 1961-1990 reference period by 1.5°C, while in the western and eastern parts of the country, the increase exceeded 2°C. Such trend will continue up to 2-4.3°C until the end of the century. The annual precipitation increased by 10%, and in the southern part of the country up to 20% relative to the reference period¹⁵ The change in the mean annual precipitation will not be as pronounced as in the case of temperature change, but will be characterized by interannual precipitation redistribution, while during the summer season, the deficit of rainfall will be strongest.

The vulnerability of water resources, agriculture, forestry, including biodiversity and health has already been confirmed, while experience in the last few decades shows negative effects of climate change to energy, infrastructure, transport and Serbian economy in a whole. In addition, COVID-19 pandemic impacts social aspects of Serbian society, implying job loss for 34,700 women and a net increase of 1,500 more jobs for men in the second quarter of 2020.¹

Further detailed information necessary for clarity, transparency and understanding (ICTU) of the Nationally Determined Contribution (NDC) can be found at: www.klimatskepromene.rs.

¹ COVID-19: Socio-Economic Response Plan for Serbia, https://www.rs.undp.org/content/serbia/en/home/library/crisis_prevention_and_recovery/covid-19-socio-economic-response-plan.html; COVID-19 Socio-Economic Impact Assessment | UNDP in Serbia

Following the decisions 1/CP.21, 4/CMA.1, 9/CMA.1, 18/CMA.1, the following NDC-related quantifiable information is hereby submitted:

1. Quantifiable information on the reference periods (including, as appropriate, the base year)	
(a) Reference year(s), base year(s), reference period(s) and other starting point(s)	<p>Base year: 2010</p> <p>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.</p> <p>Projections reference year: 2015</p>
(b) Quantifiable information on the reference indicators, their values in the reference year(s), base year(s), reference period(s) or other starting point(s), and, as applicable, in the target year;	Further quantifiable information on the reference indicators are available in the National GHG Inventories
(c) For strategies, plans and actions referred to in Article 4, paragraph 6, of the Paris Agreement, or policies and measures as components of nationally determined contributions where paragraph 1(b) above is not applicable, Parties shall provide other relevant information;	Not applicable
(d) Target relative to the reference indicator, expressed numerically, for example, as percentage or amount of reduction;	(A) economy-wide target - reduction of GHG emissions by 2030: <ul style="list-style-type: none"> - 13.2 % compared to 2010 - 33.3% compared to 1990
(e) Information on data sources used in quantifying the reference point(s)	<p>National GHG inventories for the 1990 – 2015 period</p> <p>Prepared by the Serbian Environmental Protection Agency (SEPA) and presented in the Second Biennial update report under the United Nations Framework Convention on Climate Change</p>
(f) Information on the circumstances under which the Party may update the values of the reference indicators.	<p>The National GHG emissions in the base year and the reference year may be updated and recalculated due to the methodological changes and more precise calculations.</p> <p>In addition, changes in GDP and other macro-economic parameters, such as those recognized in COVID-19 Socio-Economic Response</p>

1. Quantifiable information on the reference periods (including, as appropriate, the base year)	
	<p>Plan for Serbia² may lead to an update of the values of the reference indicators.</p> <p>Information on recalculations will be provided in the relevant chapters of the Biennial Update Report (BUR) and the Biennial Transparency Report (BTR) under the United Nations Framework Convention on Climate Change.</p>

2. Time frames and/or implementation periods	
(a) Time frame and/or period for implementation, including start and end date, consistent with any further relevant decision adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA)	The time-frame for implementation is from 1 January 2021 to 31 December 2030 .
(b) Whether it is a single-year or multi-year target, as applicable.	Single-year target established for 2030

3. Scope and coverage	
(a) General description of the target;	The contribution determined for 2030 is an economy-wide GHG reduction target , expressed as relative reduction by 2030 compared to 2010.
(b) Sectors, gases, categories and pools covered by the nationally determined contribution, including, as applicable, consistent with Intergovernmental Panel on Climate Change (IPCC) guidelines;	Energy, Industrial processes and product use (IPPU), Agriculture, Waste
	<p>Gases covered: all greenhouse gases (GHG) not controlled by the Montreal Protocol – carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), sulphur hexafluorides (SF₆) and nitrogen trifluorides (NF₃).</p> <p>Carbon pools: not applicable</p>

² https://www.rs.undp.org/content/serbia/en/home/library/crisis_prevention_and_recovery/covid-19-socio-economic-response-plan.html

3. Scope and coverage	
<p>(c) How the Party has taken into consideration paragraph 31(c) and (d) of Decision 1/CP.21;</p>	<p>Applied IPCC Guidelines: The national GHG inventory (GHG emissions by sources and removals by sinks) is prepared in accordance with the 2006 IPCC Guidelines for the National Greenhouse Gas Inventories and the 2013 Supplement to the 2006 IPCC Guidelines for the National Greenhouse Gas Inventories - Wetlands (IPCC 2013 Wetlands Supplement).</p> <p>The Republic of Serbia takes note of future application of the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories³.</p> <p>There are several activities which cannot be estimated due to lack of data:</p> <ul style="list-style-type: none"> • Use of fluorinated gases as foam blowing agents, in fire protection equipment and electrical equipment; • Liming activities; • Open burning.
<p>(d) Mitigation co-benefits resulting from Parties' adaptation actions and/or economic diversification plans, including description of specific projects, measures and initiatives of Parties' adaptation actions and/or economic diversification plans.</p>	<p>The implementation of the adaptation measures proposed in the Draft Third National Communication to the UNFCCC and Adaptation Planning Framework will contribute to the achievement of the full mitigation potential in the sectors of agriculture, forestry and water as analysed in the new report on nature-based solutions⁴:</p> <p>Agriculture – food production</p> <ul style="list-style-type: none"> • New irrigation systems construction and efficient use of existing ones • Multipurpose small accumulation lakes, ponds and reservoirs for water supply, irrigation, erosion control, ecosystem services <p>Adaptation of the technologies of agricultural plant and animal production (selection of species and agro-technical measures, increasing the quality of soil and rational use of fertilizers, adaptation of crop rotation, adaptation of zootechnical conditions in animal husbandry facilities). Appropriate selection of species might reduce water and nutrient supply, therefore, reducing GHG emissions. Increased agricultural biomass production can partly be used (crop residues, waste) for renewable energy production, replacing the use of fossil fuels⁵. Nutrient management's mitigation potential was assessed to 1.09 Mt CO₂ equ./yr. Optimal grazing management and grazing legumes in pastures have the potential to reduce GHG emissions by 0.27 Mt CO₂ equ./yr.</p> <p>Forestry – bioenergy</p> <ul style="list-style-type: none"> • Afforestation of new land using site mapping and climate change adapted tree species,

³ <https://www.ipcc-nggip.iges.or.jp/public/2019rf/index.html>

⁴ UNDP (2020): Nature-based solutions for climate change mitigation and adaptation.

⁵ Strategy of Agriculture and Rural Development for the period 2014-2024

3. Scope and coverage

- Reforestation,
- Implementation of an improved forest management close-to-nature forest management, introduction of a "climate smart forestry" approach
- Forest fire management and
- Integrated disease and pest management

result in mitigation co-benefits by supporting the replacement of fossil fuels and construction materials by biomass. The mitigation potential of afforestation has been assessed at 25.9 Mt CO₂ equ/yr. The effect of Sustainable Forest Management and Close to Nature Management is estimated at 1.008 Mt CO₂ eq by the year 2030, from all three aspects (close to nature forest management, conversion of coppice forest and regeneration of over mature stands – mainly beech).

Hydrology and Water Resources– hydro-electric production

- Construction of flooding/torrential barriers and additional measures in the basin
- Improvement of the system for observation, data collection and early warning systems for extreme climate and hydrological events and development of mathematical models for optimal management of hydro power plants (HPPs)
- Increase in water storage capacity

Water availability is an important factor for the production of renewable energy (hydro power) and the production of biomass for the production of energy and construction materials.

Mitigation co-benefits resulting from adaptation actions will be further elaborated in the National Adaptation Programme (NAP) that is under development and might increase the co-benefits mentioned above.

4. Planning processes	
(a) Information on the planning processes that the Party undertook to prepare its nationally determined contributions and, if available, on the Party's implementation plans, including, as appropriate:	<p>The GHG emission reduction target presented in this NDC is determined based on the Draft Low Carbon Development Strategy (LCDS), while its achievement is defined by an accompanying Action Plan. The planning and information relevant to the NDC are presented in Second BUR (BUR2). During the process of preparation of relevant documents, working groups were formed and numerous consultations, round tables with active participation of representative of government institutions, public and private companies, NGOs and scientific and research institutions were held.</p> <p>The NDC planning and revision took into account obligations resulting from the EU accession process as well as national circumstances and capacities.</p> <p>Following the international and certain provisions of the EU legislation, involvement of the broad range of stakeholders was ensured through public consultation process, working groups responsible for preparation of the NDC, as well as on-line surveys and questionnaires.</p>
(i) Domestic institutional arrangements, public participation and engagement with local communities and indigenous peoples, in a gender-responsive manner;	<p>The Ministry of Environmental Protection (MEP) has responsibility for matters related to climate change on national and international level.</p> <p>The Law on Climate Change (LCC) adopted in March 2021, defines roles and responsibilities of other ministries, agencies and organizations.</p> <p>Gender equality strategy for the 2021 to 2030 period, which in point 5.1.1.5. envisages the mainstreaming of the gender perspective in the field of environmental protection, circular and green economy and information technologies/digital economy.</p>
(ii) Contextual matters, including, inter alia, as appropriate:	
(a) National circumstances, such as geography, climate, economy, sustainable development and poverty eradication	Information provided in BUR2.
(b) Best practices and experience related to the preparation of the nationally determined contributions	<p>Establishment of the WG for development of NDC that included representatives of different stakeholders and responsible institutions ensured easier collection of data and information. In addition, the Law on Climate Change re-established the National Committee on Climate Change as a government advisory body, with the first session with newly appointed members held in September 2021.</p> <p>Since 2018, the Coordination Body for Gender Equality has representatives in working groups of the inter-ministerial projects</p>

4. Planning processes	
	<p>supporting improvement of reporting to the UNFCCC in a context of gender equality.</p> <p>The economic, environmental and social impacts of the Mitigation Actions were considered in the NDC preparation process.</p> <p>The NDC preparation process was not possible without international financial and technical support that contributed to improvement of the national capacities.</p> <p>However, there is still a need for financial and capacity building and raising awareness to ensure the NDC implementation and revision.</p>
(c) Other contextual aspirations and priorities acknowledged when joining the Paris Agreement	<p>Serbia suffered damages caused by climate change and extreme weather events (in the period 2000-2015 minimum EUR 1.8 billion, additional to EUR 5 billion in the 2015-2020 period).</p> <p>With significant contribution of the agricultural production to total gross domestic product, the overall national economy of the Republic of Serbia is sensitive to all factors that affect agriculture. Impacts of climate change on crop production and livestock production have impact on food storage and food processing sectors in Serbia.</p> <p>The effects and impacts of climate change on the water sector will be reflected in shortage of water, more periods of intense drought and areas affected by droughts and an increased duration of low-flow conditions in rivers and resulting low-level water quality.</p>
(b) Specific information applicable to Parties, including regional economic integration organizations and their member States, that have reached an agreement to act jointly under Article 4, paragraph 2 of the Paris Agreement, including the Parties that agreed to act jointly and accept the terms of the Agreement, in accordance with Article 4, paragraphs 16–18, of the Paris Agreement;	N/A

4. Planning processes	
<p>(c) How the Party's preparation of its nationally determined contribution has been informed by the outcomes of the global stocktake, in accordance with Article 4, paragraph 9, of the Paris Agreement</p>	<p>Support for the preparation for the global stocktake was delivered under the "Introduction of Transparency Framework under the Paris Agreement" project which lays groundwork for compliance with Article 13 of the Paris Agreement.</p>
<p>(d) Each Party with a nationally determined contribution under Article 4 of the Paris Agreement that consists of adaptation action and/or economic diversification plans resulting in mitigation co-benefits consistent with Article 4, paragraph 7, of the Paris Agreement to submit information on:</p>	
<p>(i) How the economic and social consequences of response measures have been considered in developing the Nationally Determined Contribution</p>	<p>The economic, environmental and social impacts of the Mitigation Actions were considered during preparation of the NDC, and particularly during preparation of the Low Carbon Development Strategy. The identification of the most appropriate pathway for reduction of GHG emissions was subject to costs, as well as social, economic and environmental impacts. In order to define equitable and economically efficient GHG emission reduction pathway, impacts of Mitigation Actions on gross domestic product (GDP) growth, employment and share of energy costs in households for different mitigation scenarios were considered.</p> <p>The emission reduction target for 2030 was defined according to the GHG emission reduction potential, as well as its impact on social, economic and environmental parameters.</p>
<p>(ii) Specific projects, measures and activities to be implemented to contribute to mitigation co-benefits, including information on adaptation plans that also yield mitigation co-benefits, which may cover, but are not limited to, key sectors, such as energy, resources, water resources, coastal resources, human settlements and urban planning, agriculture and forestry;</p>	<p>Public policy documents prescribed by the Law on Climate Change will more closely define measures and activities that will contribute to co-benefits in the context of climate change mitigation in the key sectors.</p>

4. Planning processes	
<p>and economic diversification actions, which may cover, but are not limited to, sectors such as manufacturing and industry, energy and mining, transport and communication, construction, tourism, real estate, agriculture and fisheries.</p>	

5. Assumptions and methodological approaches, including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals	
<p>(a) Assumptions and methodological approaches used for accounting for anthropogenic greenhouse gas emissions and removals corresponding to the Party's nationally determined contribution, consistent with decision 1/CP.21, paragraph 31, and accounting guidance adopted by the CMA;</p>	<p>The information is available in the 2BUR and in case of changes, updated information will be presented within the Biennial Transparency Report.</p>
<p>(b) Assumptions and methodological approaches used for accounting for the implementation of policies and measures or strategies in the Nationally Determined Contribution;</p>	<p>In accordance with the Law on Climate Change, authorities and organisations responsible for implementation of climate change measures and policies are due to conduct assessment of the impacts of its policies and measures on the GHG emission level and submit reports to the Ministry for Environmental Protection.</p> <p>Implementation of the measure will be monitored according to the National GHG Inventory and a range of performance indicators. At the same time, the national system for monitoring, reporting and verification in accordance with requirements of Article 13 of the Paris Agreement will contribute to better monitoring of the NDC.</p>
<p>(c) If applicable, information on how the Party will take into account existing methods and guidance under the Convention to account for anthropogenic emissions and removals, in accordance with Article 4, paragraph 14, of the Paris Agreement, as appropriate;</p>	<p>See answer under 5 (d).</p>
<p>(d) IPCC methodologies and metrics used for estimating anthropogenic greenhouse gas emissions and removals;</p>	<p>The current GHG inventories are compliant with Decision 24/CP.19, including the 2013 Amendment to the 2006 IPCC Guidelines of the Kyoto Protocol for the National Greenhouse Gas Inventories, and the IPCC 2013 Wetlands Supplement.</p>

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

	<p>The metrics used is the Global Warming Potentials (GWP) of a 100-year time horizon published in the IPCC Fourth Assessment Report (AR4).</p> <p>These methodologies are subject to change depending on the progress of future international negotiations on estimating and accounting rules.</p>
<p>(e) Sector-, category- or activity-specific assumptions, methodologies and approaches consistent with IPCC guidance, as appropriate, including, as applicable:</p>	
<p>(i) Approach to addressing emissions and subsequent GHG removals due to natural disturbances on managed lands;</p>	<p>The approach to addressing emissions and subsequent GHG removals due to natural disturbances on managed lands presented in the 2006 IPCC Guidelines, Volume 4, Chapter 2: Generic Methodologies Applicable to Multiple Land-Use Categories.</p>
<p>(ii) Approach used to account for emissions and GHG removals from harvested wood products;</p>	<p>The approach used to account for GHG emissions and removals from harvested wood products presented in the 2006 IPCC Guidelines, Volume 4, Chapter 12, Harvested Wood Products.</p>
<p>(iii) Approach used to address the effects of age-class structure in forests;</p>	<p>Not applicable</p>
<p>(f) Other assumptions and methodological approaches used for understanding the Nationally Determined Contribution and, if applicable, estimating corresponding emissions and removals, including:</p>	
<p>(i) How the reference indicators, baseline(s) and/or reference level(s), including, where applicable, sector-, category- or activity-specific reference levels, are constructed, including, for example, key parameters, assumptions, definitions, methodologies, data sources</p>	<p>The reference indicators, baseline(s) and reference level are used based on the National GHG Inventory and baseline scenarios taking into account policies and measures adopted by the end of 2015.</p> <p>The information are available in the 2BUR.</p>

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

and models used;	
(ii) For Parties with nationally determined contributions that contain non- greenhouse-gas components, information on assumptions and methodological approaches used in relation to those components, as applicable;	Not applicable
(iii) For climate forcers included in nationally determined contributions not covered by IPCC guidelines, information on how the climate forcers are estimated;	Not applicable
(iv) Further technical information, as required;	Not applicable
(g) The intention to use voluntary cooperation under Article 6 of the Paris Agreement, if applicable.	Not applicable

6. How the Party considers whether its nationally determined contribution is fair and ambitious in the light of its national circumstances:

(a) How the Party considers whether its Nationally Determined Contribution is fair and ambitious in the light of its national circumstances;

Under the UNFCCC, Serbia is a developing country Party, the energy production of which relies on domestic lignite, with an increase in the ambition of more than three times compared to the first NDC.

The NDC of the Republic of Serbia is a part of the long-term GHG emission reduction vision by 2050 as required by the Paris Agreement long-term goals.

With the baseline analyses for the Just Transition Roadmap for Serbia defined and in compliance with modalities of the global stocktake, the reduction commitments of the updated NDC of the Republic of Serbia will be considered.

Serbia suffered damages of minimum EUR 1.8 billion in just five-years (2015-2020). Moreover, Serbia's potential GDP decrease in case of the global mean temperature increase, relative to the projected GDP without warming is as follows:⁶

Temperature increase	GDP decrease (billion USD and%)	
	2020 - 2040	2020 – 2100
1 °C	15,465 (1.20%)	344,364 (4.19%)
2 °C	58,124 (4.53%)	766,317 (9.32%)
3 °C	59,107 (4.97%)	890,403 (11.65%)
4 °C	97,536 (6.87%)	2,002,410 (17.06%)

(b) Fairness considerations

The economic, environmental and social impacts of the Mitigation Actions were considered during the preparation of the NDC, and particularly during preparation of the Low Carbon Development Strategy. The identification of the most appropriate pathway for reduction of GHG emissions was subject to costs, as well as social, economic and environmental impacts. In order to define a socially equitable and economically efficient GHG emission reduction pathway, impacts of Mitigation Actions on gross domestic product (GDP) on employment and share of energy costs in households for different mitigation scenarios were considered. Emission reduction target for 2030 was defined according to GHG emission reduction potential, as well as its impact on social, economic and environmental parameters.

(c) How the Party has addressed Article 4, paragraph 3, of the Paris Agreement;

The presented contribution represents a clear progression beyond the first NDC and reflects the highest possible ambition under consideration of the national circumstances.

⁶ Study on socio-economic aspects of climate change in the Republic of Serbia, https://www.klimatskepromene.rs/wp-content/uploads/2020/07/engl-screen-_06-04-2020_DRAFT_-Study-on-the-Socio-economic-Aspects-of-Climate-Change-on-the-Republic-of-Serbia_UNDP.pdf

(d) How the Party has addressed Article 4, paragraph 4, of the Paris Agreement;	Serbia is a developing Party and has hereby enhanced its NDC, which represents an economy-wide reduction target.
(e) How the Party has addressed Article 4, paragraph 6, of the Paris Agreement.	Not applicable

7. How the nationally determined contribution contributes towards achieving the objective of the Convention as set out in its Article 2:

(a) How the nationally determined contribution contributes towards achieving the objective of the Convention as set out in its Article 2;	Although the Republic of Serbia is a non-Annex I Party to the UNFCCC vulnerable to climate change, significant increase of ambition in the updated NDC contributes to the achievement of the objective of the Convention, namely stabilization of GHG concentration in the atmosphere.
(b) How the nationally determined contribution contributes towards Article 2, paragraph 1(a), and Article 4, paragraph 1, of the Paris Agreement.	See answer under 7(a). In particular, it should be noted that Serbia is ready for additional/conditional ambition with financial, technical and capacity building assistance.