A thesis submitted to the Department of Environmental Sciences and Policy of Central European University in part fulfilment of the Degree of Master of Science

Challenges for climate policy implementation in Serbia: obligations of the Energy sector to comply with the Paris Agreement

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July, 2021

Vienna

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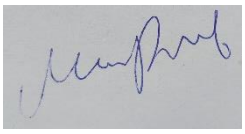

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ABSTRACT OF THESIS submitted by: Mirjana VOLAREV

for the degree of Master of Science and entitled: Challenges for climate policy implementation in Serbia: obligations of the Energy sector to comply with the Paris Agreement.

Month and Year of submission: July 2021.

The Paris Agreement was signed by 196 contracting parties to combat climate change challenges. One of the Paris Agreement's goals is to decrease GHG emissions. Serbia signed the Paris Agreement promising to lower GHG emissions, mostly coming from the energy sector.

Serbia increased efforts to combat climate change challenges partly through policy preparation and implementation. However, Serbia needs to improve this ambition since vast policies wait for implementation while the energy sector increases GHG emissions.

Hence, this research aims to understand and identify the main policy implementation challenges Serbia has to meet in order to combat its climate mitigation obligations regarding the energy sector under the Paris Agreement. In order to reach the mentioned research's aim, the main political, economic, and social barriers and opportunities are analyzed in this study. Thus, main documents (policies, strategies, and reports) were analyzed, and 15 interviews with the experts were conducted to comprehensively outline current challenges in Serbia for the energy sector to comply with the Paris Agreement.

This study offers an overview of a current political, economic and social system that supports or stands in the way of decarbonizing the energy sector in Serbia and gives recommendations for future research and the ones to solve the main barriers.

Keywords: Climate change, The Paris Agreement, Climate policy implementation, Energy sector, GHG emissions, Political, economic and social challenges

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Acknowledgments

Firstly, I would like to thank my supervisor, mentor, and Professor Dr. Alexios Antypas, who supported my research with his dedication. I am grateful for his advice, assistance, and flexibility that contributed to and helped my research. Furthermore, his support served as a valuable lesson through my thesis and my further professional life and future career.

Moreover, I would like to express my gratitude to professors from the Department of Environmental Sciences and Policy at Central European University. Special thanks to my faculty supervisor and mentor, Professor Dr. Laszlo Pinter, for his kindness and support during my academic year at Central European University.

I give my further gratitude to all the interviewees who participated in this research. Despite their busy schedule, they shared their insightful experience and knowledge that is valuable for my research. Hence, special thanks to all the interviewees for devoting their time and gave their special insight.

Last but not least, I would like to thank my colleges and friends from CEU for their encouragement; my family for their support; and above all, my mother for being a friend, my special professor, and enormous support during my studies and my research, allowing me to pursue my dream of studying and living abroad.

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List of Abbreviations

APCD	Action Plan for Administration Capacity Development
BOS	Belgrade Open School
CEKOR	Center for Ecology and Sustainable Development
CSO	Civil Society Organizations
EU	European Union
GHG	Green House Gas
GDP	Gross domestic product
LCDSAP	The Low Carbon Development Strategy with Action Plan
MIFP	Multi-Annual Investment and Financial Plan
MMR	Monitoring Mechanism Regulation
NALED	National Alliance for Local Economic Development
NDC	Nationally Determined Contribution
NECP	National Energy and Climate
NERP	Plan National Emission Reduction Plan
UN	United Nations
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development

1. Introduction

Climate change represents "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable periods" (UN 1992). To combat the challenges climate change brings, the Paris Agreement was adopted on 12 December 2015 by 196 Parties at COP 21 in Paris, and its ratification entered into force on 4 November 2016 (UNFCCC 2021a). The Paris Agreement represents a "legally binding international treaty on climate change" (UNFCCC 2021a). The Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC) defined the global goal of limiting the growth of the average global temperature significantly below 2 ° C (UNFCCC 2015). As a part of reaching this goal, all the signature countries are bound to reduce global greenhouse gas (GHG) emissions as soon as possible to achieve a climate-neutral world by mid-century (UNFCCC 2021a). The Paris Agreement "brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects" (UNFCCC 2021a). In order to implement the Paris Agreement, political, economic, and social transformations are necessary. As one of the main resources for GHG emissions, increasing climate change effects, it is essential to decarbonize the energy sector (Laurence 2018).

1.1 Background

The South-Eastern European region represents a vulnerable region to climate change (WWF 2012). In Serbia, climate change has different sector impacts and vulnerabilities regarding human health, **energy**, infrastructure, agriculture, ecosystems, and water resources (USAID 2017).

The development of the energy sector and its influence on climate change mitigation in Serbia greatly depend on the political environment and its stability (Republic of Serbia Ministry of Mining and Energy 2016). Some political obstacles towards further sustainable development of the Serbian energy sector represent "lag for the changes in energy sector policy in the region due to the unsolved social and political issues" (Republic of Serbia Ministry of Mining and Energy 2016). Moreover, there is a "political opportunism and unreadiness for depoliticization and professionalization of energy sector", and "absence of political will to conduct consistent market reforms in the energy sector" (Republic of Serbia Ministry of Mining and Energy 2016). A further challenge represents non-transparent energy policymaking (Republic of Serbia Ministry of Mining and Energy 2016). Thus, the overall political scene should have a stronger orientation towards mitigating climate change effects, primarily through the energy sector, climate policy development, and implementation.

Moreover, the energy sector is an essential industrial branch in Serbia (Republic of Serbia Ministry of Mining and Energy 2016). The Serbian energy sector participates in the Serbian economy with 4% GDP (Serbia Energy 2021). The energy sector represents an important initiator of economic changes and development (Republic of Serbia Ministry of Mining and Energy 2016). Strong development and global changes demand systematic planning and management of the energy sector (Republic of Serbia Ministry of Mining and Energy 2016). However, energy is the economic sector with the highest negative impact on the environment through GHG emissions (Republic of Serbia Ministry of Mining and Energy 2016). Its conventional energy dependence represents an obstacle towards sustainable economic development in Serbia (Republic of Serbia Ministry of Mining and Energy 2016). Therefore, the energy sector has to become stable to sustain the welfare of the country's economy (Republic of Serbia Ministry of Mining and Energy 2016).

Furthermore, every society profoundly depends on the energy sector of its country by providing a certain amount of energy and energy products alongside reducing the energy intensity and consumption (Republic of Serbia Ministry of Mining and Energy 2016). Moreover, energy sector development should be socially tolerable, which means that sudden changes cannot seriously impact society (Republic of Serbia Ministry of Mining and Energy 2016). "Key positive social consequences of such energy sector development are employment, life standard increase and improvement of the status of human rights and possibilities to use public goods" (Republic of Serbia Ministry of Mining and Energy 2016).

Alongside the Serbian economy, its society is in a deep crisis regarding development - unsolved social issues and increased poverty (Republic of Serbia Ministry of Mining and Energy 2016). A large share of the Serbian population relies on coal, while the energy consumption increases over time (Republic of Serbia Ministry of Mining and Energy 2016). Moreover, Serbian citizens' awareness of current climate problems is very low (Republic of Serbia Ministry of Mining and Energy 2016).

To contribute to climate change mitigation, Serbia signed the Paris Agreement in 2016 and started a ratification process, which was finalized in 2017 (UNFCCC 2021b). Alongside, in 2006 Serbia became a member of the Energy Community, which obligates to implement the energy acquis (Energy Community 2020a). The Acquis is based on the comprehensive planning of both energy and the environment to lower the effects of climate change (Energy Community 2020a).

Additionally, Serbia developed several strategies and reports, represented in the desk research of this thesis, to support climate change mitigation through the energy sector and comply with the Paris Agreement and decrease GHG emissions.

The analysis of potential future climate changes shows the range of possible future climate conditions depending on the future GHG emissions, mostly coming from the energy sector (UNDP 2018). Serbia is obliged to lower its GHG emissions by 9,8% by 2030 compared to 1990, as mentioned in the Nationally Determined Contribution under the Paris Agreement (UNDP 2019a). While recognizing significant efforts invested by the Government to present GHG emissions reduction potentials in key economic sectors, there are still significant opportunities to increase this ambition (UNDP 2019a). In order to do so, it is important to analyze current political, economic, and social challenges that either support or stand in the way of Serbia reaching mentioned goal of the Paris Agreement. Thus, the Serbian energy sector's main political, economic, and social climate policy implementation challenges to comply with the Paris agreement goal to lower GHG emissions are presented in this study.

1.2. Aims and objectives

This research aims to understand and identify the main challenges Serbia has to meet its climate mitigation obligations regarding the energy sector under the Paris Agreement.

The main objectives to reach the research mentioned aims are to understand and analyze implementation challenges of the Paris Agreement in Serbia's energy sector in three segments:

- Political challenges (explore barriers and opportunities to understand how interest and power can influence the decision making in Serbia)
- Economic challenges (explore barriers and opportunities to understand what are the costs and benefits of energy transition in Serbia)
- Social challenges (explore barriers and opportunities to understand the social impact of meeting these obligations)

Together, these three segments show current challenges and outline Serbian political, economic, and social systems regarding climate policy implementation within Serbia's energy sector.

1.3. Outline of the thesis

The thesis consists of 5 chapters.

Chapter 1 briefly describes the main effect of the energy sector on climate change, which is GHG emissions. It further contains basic information about the energy sector's current Serbian political, economic, and social perspectives as stated by the Republic of Serbia Ministry of Mining and Energy. Moreover, this chapter describes the aims and objectives of the study.

Chapter 2 represents a description of the methodology used within this research. As mentioned in this chapter, the study is based on primary and secondary data presented through policy, strategy, and report analysis, and personal communication data gained from interviews. Limitations of the research are also presented in this chapter.

Chapter 3 shows an in-depth literature review and desk research. A literature review consists of various authors that reflect on the problem of the study. At the same time, desk research contains the most important documents related to the Serbian energy-climate change mitigation system by lowering GHG emissions.

Chapter 4 contains results that show a comprehensive analysis of documents and qualitative data gathered from the interviews. This chapter is structured in 2 parts. The first part consists of the main and most important information from analyzed documents. This information is about the energy sector's political, economic, and social aspects related to the Paris agreement's goal to decrease GHG emissions. The second part shows the qualitative data gathered from the

interviews. It outlines the main political, economic, and social challenges of the energy-climate change interactions in Serbia.

Chapter 5 gives an outline through mentioned analyzed documents and data gathered from interviews; this chapter contains a discussion on how do these two segments overlap. Finally, this chapter shows an overview of similarities and differences between documents, data gained through interviews, and literature from different authors.

Chapter 6 summarizes the essential findings related to the political, economic, and social energy-climate system in Serbia; it further reflects on them to draw conclusions on main challenges - barriers and opportunities.

2. Methodology

The overall research design combined primary and secondary data and qualitative research methods. These methods served to identify and gather in-depth insights into political, economic, and social challenges Serbia faces to comply with the Paris Agreement requirements and standards to lower GHG emissions coming from the energy sector. The research involved Serbia as the case country and was conducted in the period April-July 2021.

2.1. Data collection

One of the leading methods used represents desk research to understand better political, economic, and social challenges for climate policy implementation in Serbia. In-depth desk research included analyzing the available secondary data: literature and documents on implemented obligations and strategies (Stewart and Kamins 1993). The academic literature was gathered mainly over an online search of Google Scholar and the library of the Central European University. Desk research enabled gathering valuable information that supported the research context and gave the basis for understanding climate policy structure and its implementation in Serbia, as well as the political, economic, and social aspects of it.

Analyzed policy documents are gathered in table 1.

Table 1. Documents analyzed within the study

EU policies and reports	Serbian policies and reports
Treaty establishing Energy Community/ Energy Community Annual Implementation Report for Serbia 2020 European Commission Progress 2016, 2018, 2019 and 2020 Report	Book of Recommendations for Chapter 27 and chapter 15 of the National Convention on the European Union (2020)

Documents were analyzed based on keywords represented in table 2. Besides keywords, specific chapters concerning the research topic within the documents helped identify and understand Serbian climate policy implementation's political, economic, and social aspects.

Table 2. Main keywords used for researching analyzed documents

Key term	Climate and energy policies	Implementation challenges
Associated keywords	Climate change mitigation Energy efficiency Renewable energy Rationalizing energy use Decarbonization of the energy sector Awareness of climate change	Political challenges Economic challenges Social Challenges

This research is also based on qualitative methods and conducted interviews.

The qualitative data came from conducted through the form of semi-structured interviews that gave insight into current challenges of implementation. This included defining the list of respondents – including representatives of different institutions and organizations, professionals and experts, and drafting issues/questions that will be discussed during the interviews (Barriball and While 1994).

The list of respondents who accepted to participate in the interviews is presented in table 3.

Because of the current COVID-19 global pandemic, every interview was conducted on online video platforms and lasted for 30-45 minutes. All the interviewees were consentient in advance with the material used from interviews to conduct the research. To keep the anonymity of interviewees, only institutions and positions are given in the table. Throughout the research, interviewees are mentioned by numbers represented in table 3.

Table 3. List of respondents/interviewees

Interviewee	Organization and position	Interview date
Interviewee #1	National Alliance for Local Economic Development (NALED), Environment Unit, Policy officer, Serbia	12.05.2021
Interviewee #2	NALED, Environment Unit, Policy coordinator, Serbia	13.05.2021
Interviewee #3	United Nations Development Program (UNDP), Project Coordinator, Serbia	24.05.2021
Interviewee #4	Ministry of Mining and Energy, Serbia, State secretary	26.05.2021
Interviewee #5	NALED, Environment Unit, Head of Environment Unit, Serbia	27.05.2021
Interviewee #6	Faculty of Forestry, University of Belgrade, Dean	29.05.2021
Interviewee #7	Center for Ecology and Sustainable Development (CEKOR), founder, director, Serbia	03.06.2021
Interviewee #8	CEKOR, coordinator for energy, climate change, and monitoring of international financial institutions, Serbia	07.06.2021
Interviewee #9	Green Loop Consulting, PR, Serbia	09.06.2021
Interviewee #10	Belgrade Open School (BOS), Programme Manager, Serbia	10.06.2021
Interviewee #11	Energy Community, Senior Environmental expert. Austria	11.06.2021
Interviewee #12	Ministry of Environmental Protection Serbia, special advisor for Minister	17.06.2021
Interviewee #13	Environmental Ambassadors for Sustainable Development, European Climate Pact Ambassador, Serbia	17.06.2021
Interviewee #14	NALED, Serbia	18.06.2021
Interviewee #15	Environment Engineering Group, Environmental engineer, Serbia	01.07.2021

All the respondents were contacted through email, and after they accepted the invitation, the interviews were conducted by direct conversation through online platforms (as explained above). As a result, they gave their insight on current challenges regarding climate and energy-

related policy implementation. Furthermore, the interviewees gave information and contacts for additional and future possible interviewees.

The interviews were conducted within three categories: representatives of Public, Private, and Civil Society Organizations (CSO) from Serbia and Austria to enable needed diversity and gather the necessary information to comprehend political, economic, and social climate policy implementation challenges related to the Serbian energy sector to achieve the aims and the objectives of the research.

The main interviewees from the Austrian and Serbian **public sector** are Vienna's Energy Secretariat representatives, the Ministry of Mining and Energy in Serbia, and the Ministry of Environmental Protection in Serbia representatives. In addition, for the purpose of this document, Vienna's Energy Secretariat of the Energy Community and UNDP as United Nations lead agency on international development is also considered part of the public sector.

Other interviews were conducted with relevant **CSOs** from Serbia, such as representatives of Environmental Ambassadors for Sustainable Development, Centre for Ecology and Sustainable Development (CEKOR), Environment Engineering Group (political, social, and economic insights).

Members of the NALED alliance for environmental protection and BOS represent the interviewees from the **private sector** in Serbia.

2.2. Data analysis

To encompass all the mentioned perspectives and gain needed diversity, 15 interviews were conducted.

Transcribed interviews enabled the gathering of the needed information to conduct the research. The interviews are transcribed and coded. Moreover, the documents that are a part of this

research are also coded. Gathered data is coded and analyzed according to the data analysis procedures of grounded theory. The grounded theory represents a qualitative research methodology based on forming theories through analyzed data and interviews (Corbin and Strauss 1998). For the purposes of this study, open, axial, and selective coding was used in order to find similarities between data from the interviews (Corbin and Strauss 1998).

Further qualitative data were gathered into groups/segments representing selected codes: political, economic, and social segments, represented in the results section of this research. A combination of purposive and snowball sampling was used. The Snowball sampling technique is often used in qualitative research (Parker et al. 2019). Interviews started firstly with the small sample/number of respondents, and then they were asked to recommend other potential interviewees (Parker et al. 2019). Thus, "increasing chain of participants" (Parker et al. 2019).

Mentioned methods were chosen because they can best emphasize the research topic; literature review, documents desk research, and interviews enabled more findings and detailed conclusions on current challenges (barriers and opportunities) in Serbia.

2.3. Limitations

As expected, not all respondents could participate. However, those who participated, even though there is a small interview sample, the respondents gave an enormous and valuable contribution to this research. Coming from different sectors and backgrounds, they described the Serbian energy and climate diverse system and delivered an important insight for this study.

Further limitations represent the way interviews were conducted. Due to the COVID-19 pandemic, all the respondents were contacted and interviewed online. Which had a positive side; it was easier to reach them all and have more interviews during one day. However, it would be better if interviews were in person. Moreover, during some interviews, there were

internet connection problems, so interviews were prolonged. Which, in the end, did not affect the quality of the interview, only the duration of it.

Moreover, one of the biggest limitations is that generally, in Serbia, energy and climate problems are not big enough in the academic world, especially through policy. Therefore, describing Serbia's energy sector's political, economic, and social perspectives and how it is related to climate change mitigation was not very easy. However, analyzed documents and interviews gave good insight.

Last but not least, parts of this thesis might be interpreted as too general. I want to emphasize that this thesis outlines three significant perspectives (political, economic, and social); to encompass and clarify necessary information, sometimes it was unavoidable to be a bit general. Nonetheless, it is all in purpose to comprehensively outline current climate and energy interactions in Serbia since there is no such research.

3. Challenges for Serbia's energy sector to comply with the Paris Agreement

Developing countries represent one of the biggest GHG emissions resources (Laurence 2018). "Developing countries are increasing significantly the emission of greenhouse gases (GHGs) due to their rapid growth, urbanization and growing motorization" (Mrkajic et al. 2015). Thus, developing countries should "choose sustainable energy transition pathways" (Laurence 2018). Additionally, "support shall be provided to developing country Parties for the implementation" towards decreasing GHG emissions (UNFCCC 2015). Serbia has been described as a country with an economy in transition, in other words, with a developing economy (United Nations 2021). It is important to highlight that not only developing countries should decrease their emissions and mitigate climate change. Hence, to respond to climate change, a joint force of developed and developing countries is needed (Mrkajic et al. 2015).

Economic, political, and social stability is essential to enable the energy sector's sustainable functioning (Republic of Serbia Ministry of Mining and Energy 2016). The ideal situation implies that the economy and society of the country have lower economic costs and increased sustainability of society and environment (Republic of Serbia Ministry of Mining and Energy 2016). Therefore, the development of the energy sector in Serbia should result in "adequate energy, economic, environmental and social policy, which would, with adequate legislation and the country acting in accordance with the law, lead to sustainable energy system, more efficient economy and better social prosperity with sustainable balances of natural resources" (Republic of Serbia Ministry of Mining and Energy 2016).

"The key drivers of the energy transition include: a stable political vision with long-term energy transition commitments; institutional and regulatory support for decarbonization that is subsequently reflected in increased and swift penetration of renewable energy into the energy

supply mix with a focus on local sources; decisive improvements in energy efficiency" (Young and Macura 2020). When it comes to Serbia, "energy sector in Serbia was recognized by far as a sector with the largest share in Serbia's total GHG emissions" (Lazarević et al. 2017). Therefore, enhancing climate change effects.

It is important to highlight that in Serbia, the GHG emissions of the "energy sector are estimated at 31 million t CO2 eq. (year 2010, without Kosovo), which is about 45% of Serbia's total CO2 emissions" (Bozic et al. 2015). Moreover, "as energy utilization is inefficient, Serbia ranks among the 20 most energy intensive and among the 10 most carbon intensive countries in the world in terms of GDP" (Bozic et al. 2015).

Thus, energy planning has to oversee natural resources and the environment (Lazarevic et al. 2017). It is important to highlight that the economic and financial possibilities for investing in climate change in Serbia are very limited, representing an obstacle to reducing GHG emissions (Lazarevic et al. 2017). However, there are possibilities for higher **energy efficiency**, **renewable energy sources share** and **rationalizing the energy use** in Serbia (Lazarevic et al. 2017).

3.1. The EU accession challenges

As a candidate for joining the EU, "Serbia is committed to serious and systematic preparations necessary to comply its future obligations during the EU accession process and country's adaptation to global trends" (Lazarević et al. 2017). Therefore, Serbia needs to fulfill certain obligations, representing climate change mitigation and lowering GHG emissions (National convent for EU 2020). Furthermore, "The energy sector of Serbia will be faced with the obligation of investments in CO2 emissions reduction" (Cvetkovic et al. 2016). Hence "the diversification of natural resources as well as the increase in energy production from renewable sources will have to be achieved" (Cvetkovic et al. 2016).

Moreover, "local policies related only to reduction of GHG emission are usually jeopardized by low level of political commitment and low level of policy effectiveness" (Mrkajic et al. 2015). Therefore, one of the most essential issues represents the energy policy reforms (Karovic Maricic et al. 2018).

As mentioned earlier, the main roadmap towards required energy sector development in Serbia represents the improvement of energy efficiency, a larger share of renewables, and sustainable energy consumption, which can partly be done by applying EU energy policies and strategies (Karovic Maricic et al. 2018). Intensive policy reforms regarding the energy sector started in 2004 (Karovic Maricic et al. 2018). Some progress has been made, but more work has to be done (Karovic Maricic et al. 2018). The overall progress of Serbia accomplishing climate policy implementation is lower than it should be; it seems that the EU is more worried about this than Serbia itself (Brnabic 2014). Serbia depends primarily on coal, and renewables are not fully developed to meet the energy needs in Serbia (Pavlovic et al. 2021).

Moreover, Serbia's high reliance on coal is highly unsustainable, especially regarding climate change mitigation and GHG emissions (Brnabic 2014). "Main primary energy sources in Serbia are coal, oil and natural gas, oil shale and renewable energy sources" (Stamenic et al. 2016). "The share of high quality primary energy sources (oil and natural gas) is less than 1% of total geological reserves, while the rest of 99% consists of different types of coal" (Stamenic et al. 2016). This reliance negatively affects Serbia's energy security, which can cause further economic, social, and political problems within the energy sector (Brnabic 2014). "Serbia is simply not large and rich enough to preserve its coal-based energy policy, but it is slow to act on this assessment" (Brnabic 2014). Therefore, key factors influencing further energy climate policymaking are political, economic, and social risks (Zlatanovic et al. 2017). Thus, to accomplish mentioned decarbonization towards lowering GHG emissions and contributing to

climate change mitigation, Serbia needs to overcome some economic, political, and social challenges of the energy sector.

To encompasses the most important economic, political and social challenges, essential documents regarding the compliance of Serbia's Energy sector towards the Paris Agreement goal to lower GHG emissions are represented within this chapter. The mentioned documents are **Treaty establishing Energy Community/ Energy Community Annual Implementation Report for Serbia 2020, European Commission Progress 2016, 2018, 2019 and 2020 Report** and **Book of Recommendations for Chapter 27 and chapter 15 of the National Convention on the European Union (2020)**.

The Energy Community represents an international organization that brings EU countries together with EU candidates and neighborhood countries to create an integrated energy market (Energy Community 2021a). This organization was founded in 2006 by the Treaty establishing the Energy Community, to (Energy Community 2020b):

- Develop a stable framework that will attract investments in power generation and networks;
- Establish an energy market that will allow energy trade and integration with the EU market;
- Assure stable energy supply, essential for economic and social development and stability;
- Upgrade the use of renewable energy and energy efficiency, thus improving the environmental concern related to energy supply;
- Create regional competition, alongside taking advantage of economies of scale.

Besides EU participants, the Energy Community and the Treaty establishing Energy Community have Albania, Bosnia and Herzegovina, Kosovo, North Macedonia, Georgia, Moldova, Montenegro, **Serbia**, and Ukraine as contracting parties (Energy Community 2021a). Table 4 consists of undertaken and future essential actions that need implementation, according to the Energy Community Annual Implementation Report for Serbia (Energy Community 2020b).

Table 4. Undertaken and future needed actions for Serbia (Energy Community 2020b)

	UNDERTAKEN ACTION	FUTURE NECESSARY ACTION
SERBIA ANNUAL IMPLEMENTATION REPORT (ENERGY COMMUNITY)	National Emission Reduction Plan	• National Energy and Climate plan • National Emission Reduction Plan needs implementation • Reach Renewable energy target • Comply with the emission limit values on an individual basis
	The opt-out regime of functioning for large combustion plants	
	Wind power capacities	
	RENEWABLE ENERGY	
	Secondary legislation on renewables are adopted	• Prioritize legal and regulatory framework towards implementing renewable actions • administrative capacity should integrate renewables
	Serbia increased renewable energy capacities	
	Serbia adopted laws on biofuel	
	Ongoing assessment of Serbia's national biofuel production	
	Serbia adopted a Rulebook on the renewable energy share	
	CLIMATE CHANGE	
	Serbia is preparing Nationally Determined Contribution (NDC)	• legal instruments that support operators to share information on GHG emissions • Adopt the LCDSAP • National Energy and Climate Plan (NECP) • Set a working group for NECP • Serbia should work on the policy planning and analytical work under the LCDSAP and NDC
	Serbia is preparing the second Biennial Update Report	
	Serbia is preparing the third National Communication	
	Institutional, procedural arrangements and administrative capacity are strengthened	
	LCDSAP draft passed public consultations	
	A working group for LCDSAP was set	

The mentioned Annual Implementation report consists mainly of political and economic segments regarding the Energy sector in Serbia, complying with the Paris Agreement goal to lower GHG emissions, thus, contributing to climate change mitigation. Social challenges are not mentioned within this report.

European Commission Progress Reports are annual strategies that set a way forward for EU candidate countries and potential candidates (European Commission 2021a).

Table 5. Undertaken and future needed actions for Serbia (European Commission 2016; European Commission 2018)

	UNDERTAKEN ACTIONS	FUTURE NECESSARY ACTIONS
EUROPEAN COMMISSION PROGRESS REPORT SERBIA 2016	Implementation at an early stage	• National strategy on Climate change • GHG inventories need administrational and technical reinforcement • Stronger administrative capacity • Awareness-raising • Enhance financial capacity • Ratification of the Paris Agreement
	National Climate Change Committee was formed	
	First Biennial Update Report regarding GHG to the UNFCCC	
	The Paris Agreement is signed	
	Ratification for the Paris Agreement has started	
	Improved GHG gas inventories	
	A legislation draft on GHG emissions has started	
EUROPEAN COMMISSION PROGRESS REPORT SERBIA 2018	Implementation at an early stage	• better cross-sectoral integration of climate change actions by the National Climate Change Committee • lack of the data accuracy • administrative and technical capacity reinforcement • stronger financial, administrative, and awareness-raising capacity
	Development of the national cross-sectoral strategy on climate change	
	Ratification of the Paris Agreement in 2017	
	Improved GHG inventories	
	Drafting of the legislation on GHG emissions monitoring, reporting and verification finalized in 2017	
	Legislation implementation on the fluorinated gases and ozone depleting substances continues	

Table 5 and table 6 represent a summary of yearly progress reports on Serbia in 2016, 2018, 2019, and 2020 on Chapter 27: Environment and climate change (2017 progress report hasn't been made, and a progress report for 2021 is currently in the making). Thus, all progress reports

represent a time outline of past, ongoing, and future opportunities and barriers to Serbia's compliance with the Paris Agreement.

Table 6. Undertaken and future needed actions for Serbia (European Commission 2019; European Commission 2020a)

	UNDERTAKEN ACTION	FUTURE NECESSARY ACTION
EUROPEAN COMMISSION PROGRESS REPORT SERBIA 2019	Implementation is at an early stage Developed a national cross-sectoral strategy on climate change Public consultation regarding the draft Law on climate change was in 2018 Improvement of the GHG inventories has continued	• National Climate Change Committee should integrate better climate action in other sectors • Adoption of the Law on climate change • Strengthen the administrative and technical capacity • Adoption of the legislation concerning GHG emissions • increased investments in clean energy • Awareness-raising • Develop a National Energy and Climate Plan • Implementation of the Paris Agreement
EUROPEAN COMMISSION PROGRESS REPORT SERBIA 2020	Implementation at an early stage GHG inventories continue Serbia is updating the Nationally Determined Contribution to the Paris Agreement	• Higher political consensus regarding the urgency to act • Law on climate change needs to be adopted • Climate strategy and action plan need to be adopted • Integration of climate action in another sector improvement • harmonization of legislation on GHG emissions • Stronger administrative and technical capacity • Awareness-raising • Higher investments towards green energy

Chapter 27 discusses the environment and climate change. Table 7 encompasses undertaken and needed future actions to mitigate climate change in Serbia through lowering GHG

emissions. The climate change issues and the Paris Agreement are the key parts of Chapter 27 of Book for Recommendations of National Convent for EU (2020) that are analyzed.

Table 7. Undertaken and future needed actions for Serbia, Chapter 27 (National Convent for EU 2020)

	UNDERTAKEN ACTIONS	FUTURE NECESSARY ACTIONS
CHAPTER 27 OF THE BOOK FOR RECOMMENDATIONS OF THE NATIONAL CONVENT FOR EU: CLIMATE CHANGE AND THE PARIS AGREEMENT	Serbia became a member United Nations Framework Convention on Climate Change in 2001	• Carbon neutral until 2050 • Lowering GHG by 40% • Increasing the inclusion of renewable resources for 27% • Improving energy efficiency for 27% • Start the National Energetic and Climate Plan (NECP) • Lowering GHG emissions by 9,8%, compared to 1990 • Harmonize the emissions of large combustion plants until 2027 • Strategy and plans need to be binding • Higher interest in problems from the Government • Penalizing/punishing the most significant pollutants • Air protection strategy needs to be adopted • New air quality plans and monitoring process needs to be adopted • Working groups need to be monitored • Projects are yet to be supported by MIFP • Institutions need administrational strengthening • Green Fund needs to get stronger and give support for lowering GHG emissions • Green Fund should directly manage taxes and have bigger financial support • Serbia has to pay fees for CO2 emissions • Develop mandatory public hearings and consultations when planning documents • Raise awareness of current climate concerns
	Low carbon strategy (2016)	
	Ratification of the Paris Agreement in 2017 in Serbia (signed in 2016)	
	A working group was created in 2018 to lower air pollution (members of the group are representatives of the Environmental Agency and Institute for Public Health)	
	Increased inspection supervision for large emitters of harmful gases in 2018	
	The Green Fund was set in 2018	
	Serbia adopted National Emission Reduction Plan (NERP) in 2020 (the plan was formed in 2016)	
	Initiated labor control in 2020 because of the over-pollution	
	In 2020 government negotiated a position for Chapter 27 - Environment and Climate change	
	An implementation plan was set for the Guideline 2010/75/EU	
	In 2020 Multi-Annual Investment and Financial Plan (MIFP) was enclosed	
	Action Plan for Administration Capacity Development (APCD) was set in 2020	
	Draft of the Law on Climate change	
	the Law on Climate change (adopted in 2021)	

According to the National Convent for EU (2020), in 2020, the Serbian Government negotiated a position for Chapter 27 - Environment and Climate change. Thus, creating conditions for this chapter to be sent to the European Commission (National Convent for EU). Moreover, Chapter 27 is a very complex document drafted through the cooperation of 28 institutions, in which state bodies of the Republic of Serbia participated (National Convent for EU 2020). Under chapter 27, one of the most important sections represent climate change (National Convent for EU 2020).

Serbia is a candidate for the EU, and as a part of the negotiations, climate change mitigation represents the essential part (National convent for EU 2020). Future projections show that Western Balkan countries are highly exposed to climate change effects through higher temperatures, floods, and extreme and more frequents droughts (National Convent for EU 2020). Another problem brought up by the National Convent for EU (2020) was a lack of interest in mitigating air pollution and increasing air quality. As they further highlight, it seems that the Republic of Serbia and its Ministry of Environment have not acted appropriately regarding this situation, alongside not fixing problems and letting them escalate even more. Having in mind stated above, the Government of the Republic of Serbia and competent institutions should increase efforts and adequately plan the next steps and their implementation towards lowering the GHG emissions and reaching a sustainable economic system in Serbia as well as reducing the risks, damage, and loss during natural disasters (National Convent for EU 2020).

Table 8 encompasses undertaken and necessary future actions towards mitigating climate change in Serbia through the Energy sector through Chapter 15 of the Book of Recommendations.

Table 8. Undertaken and future needed actions for Serbia, Chapter 15 (National Convent for EU 2020)

	UNDERTAKEN ACTIONS	FUTURE NECESSARY ACTIONS
CHAPTER 15 OF THE BOOK FOR RECOMMENDATIONS OF THE NATIONAL CONVENT FOR EU: ENERGY AND GHG EMISSIONS	Incorporated the basics of the EU acquis	• Set a plan for oil and gas • Lower CO2 emissions • Implement the Paris Agreement • Fulfill 2030 GHG emissions reduction obligations • Energy Efficiency Fund • Harmonize legislative framework and develop a sustainable financing • Strengthening technical capacity • Strengthening professional organizations • Improvements in transparency, abilities, and independence of facilities • Better energy efficiency • National program for lowering energy poverty
	Involved in Energy Treaty, Paris Agreement, and EU accession process	
	Increased CO2 emissions	
	Financial and material crisis	
	Energy poverty	

As mentioned previously, on the road to accession to the European Union, Serbia has to fulfill the requirements anticipated by the conditions defined under the negotiation **Chapter 15,** which discusses issues related to the energy sector (National Convent for EU 2020). European Union has set the main objectives for energy policies, representing "competitiveness, affordability, security of supply and sustainability" (National Convent for EU 2020). Furthermore, the EU policies related to energy include renewable energy and energy efficiency promotion (National Convent for EU 2020). Lastly, the EU promotes a transition towards clean energy (National Convent for EU 2020). Thus, the primary goals represent prioritizing energy efficiency and renewable energy (National Convent for EU 2020).

3.1.1. Lack of strategic planning and implementation as a political and economic barrier towards GHG emission reduction in Serbia, presented by the Energy Community

According to the Energy Community (2020), the necessary development of the National Energy and Climate Plan (NECP) is lacking. When it comes to emissions, Serbia adopted National Emission Reduction Plan (NERP), "instead of complying with the emission limit values on an individual basis following an infringement procedure" (Energy Community 2020b). However, a lack of implementation in practice is a present obstacle (Energy Community 2020b). Together, NECP and NERP represent essential policies that can further decrease GHG emissions from the Serbian energy sector.

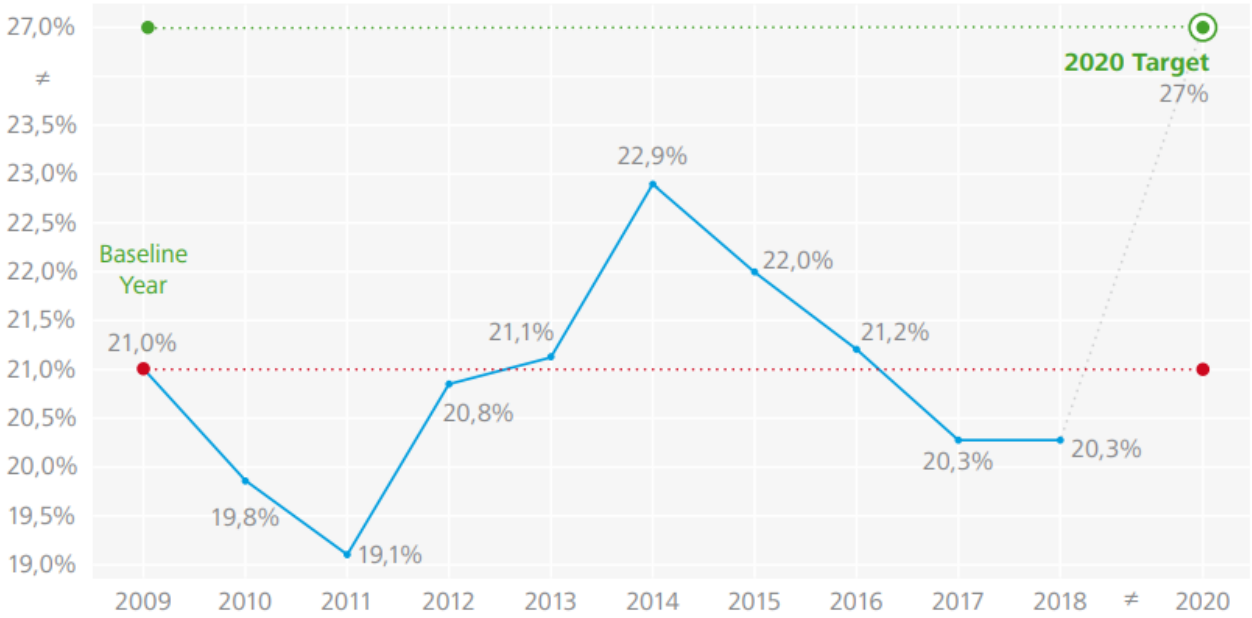
Electricity production in Serbia relies primarily on coal, and to a much lower extent, on hydropower (Energy Community 2020b). Even though there is an important demand to decrease coal reliance, in 2019, Serbia paid 41 million euros to support power generation coming from coal (Energy Community 2020b). There are some efforts for renewable targets since there are capacities in wind power generation (Energy Community 2020b). However, it is highlighted in the report that, if continued as is, Serbia will probably not reach the renewable energy market (Energy Community 2020b).

When it comes to renewable energy, Serbia adopted secondary legislation and increased renewable energy capacities (Energy Community 2020b). In 2019, Serbia adopted laws on biofuels that defined the share of biofuels on the market according to the sustainability requirements (Energy Community 2020b). According to the sustainability criteria, there is an ongoing assessment of Serbia's national biofuel production to initiate a national verification scheme (Energy Community 2020b). Additionally, a Rulebook on the renewable energy share in gross energy consumption was adopted in 2020 (Energy Community 2020b). However, compliance with the Serbian legal and regulatory framework towards implementing renewable

actions needs to be prioritized (Energy Community 2020b). Moreover, Serbia's administrative capacity should integrate renewables by establishing "a one-stop-shop" (Energy Community 2020b). Even though there is an ambition to increase a renewable share in the energy sector in Serbia, it is still slow and not enough.

A target for renewables share in Serbia's energy sector for 2020 represented 27% (Energy Community 2020b). However, Serbia is still far behind in reaching this goal (figure 1). Although Serbia is increasing its renewable energy share, at the same time, energy consumption is constantly rising (Energy Community 2020b).

Figure 1. Share of renewables in Serbia's energy sector (Energy Community 2020b)



According to the Energy Community Annual Implementation Report (2020), Serbia is preparing Nationally Determined Contribution (NDC) under the Paris Agreement, alongside the second Biennial Update Report and the Third National Communication. As already mentioned, Serbia is obligated to lower its emissions by 9.8% (comparing to 1990) by 2030 (Energy Community 2020b). To accomplish the mentioned goal, Serbia has made some progress. Firstly, Serbia drafted a law on climate change, which was later adopted in 2021 (The Government of the Republic of Serbia 2021). The law (that was still not adopted in 2020) was

to cover "a GHG emission inventory system, mainstreaming of climate policies, i.e. low carbon development strategies into the relevant institutional and legal framework, as well as procedural arrangements relevant for setting up a national system for policies, measures, and projections" (Energy Community 2020b).

Additionally, Serbia strengthened institutional and procedural arrangements and administrative capacity (Energy Community 2020b). However, there are no ongoing legal instruments that can support operators to share information on GHG emissions in order to develop a compilation of national inventories (Energy Community 2020b). Thus, even though there are opportunities, Serbia lags behind in legal implementation to support climate mitigation by lowering GHG emissions.

The Low Carbon Development Strategy with Action Plan (LCDSAP) until 2030 (Covers the perspective until 2050) draft has passed public consultations, but its adoption is pending (Energy Community 2020b). This strategy shall support Serbia to comply with obligations set under the Paris Agreement, together with a plan to align Serbia's GHG emissions (Energy Community 2020b). Moreover, "a working group was established by which the revision of the NDC is carried out in line with the LCDSAP" (Energy Community 2020b). National Energy and Climate Plan (NECP), alongside a working group for preparing NECP is yet to be set (Energy Community 2020b). Until this is accomplished, Serbia should work on the policy planning and analytical work under the LCDSAP and NDC update (Energy Community 2020b).

3.1.2. An overview of 'preparation' through time

General European Commission's recommendations include (European Commission 2016):

- enhancing administrative and financial capacity over stronger environmental protection agency's monitoring and reporting, and resourcing Green Fund alongside upgrading inter-institutional central and local level coordination;

- Ratification and implementation of the Paris Agreement, alongside developing a strategy for climate change, harmonized with the EU 2030 framework; alongside integration within all relevant sectors.

According to the **European Commission Progress 2016**, some progress has been achieved through preparation, but implementation in 2016 is at an early stage. One of the undertaken actions represents the formation of a National Climate Change Committee (European Commission 2016). However, it needs to do more in order to accomplish the integration of climate actions in other sectors (European Commission 2016). Moreover, as stated in progress, a national strategy on climate change that shall be harmonized with the EU 2030 framework on climate and energy policies is yet to be developed. Furthermore, Serbia put forward its First Biennial Update Report on GHG to the UNFCCC; also, the preparation for the second one started already in 2016 (European Commission 2016).

As already mentioned, when it comes to the Paris Agreement, Serbia gave its signature in 2016 and started ratification in the same year (European Commission 2016).

Additionally, the environmental protection agency in Serbia continued to improve inventories concerning GHG (European Commission 2016). Nonetheless, it needs to reinforce administrative and technical capacity to harmonize with Monitoring Mechanism Regulation (MMR) (European Commission 2016). The MMR is a monitoring mechanism made to follow and improve data collected for tracking progress on meeting the emissions target 2013-2020 (Klimatske Promene 2021).

A draft of legislation on GHG emissions, alongside monitoring, reporting, and verification, has been made. When it comes to reporting, "Serbia advanced on implementing a number of acquis provisions on ozone depleting substances, fluorinated greenhouse gases, and fuel quality"

(European Commission 2016). Administrative capacity also needs to be strengthened (European Commission 2016).

According to the European Commission in 2016, Serbia has set a way towards climate policy implementation that should positively impact GHG emissions and climate mitigation. However, mentioned political and economic segments represent preparation that needs implementation. Mentioned National Climate Change Committee, First Biennial Update Report on GHG to the UNFCCC, signature on the Paris agreement, improved GHG inventories, and a draft of legislation on GHG emissions represent opportunities. However, mentioned general recommendations given by the European Commission still represent a task and barriers that stand in the way of policy implementation.

Some European Commission's general recommendations from 2018 include (European Commission 2018):

- enhancing administrative and financial capacity over stronger environmental protection agency's monitoring and reporting, and resourcing Green Fund alongside upgrading inter-institutional central and local level coordination;
- Implementation of the Paris Agreement, alongside developing a strategy for climate change, harmonized with the EU 2030 framework; alongside integration within all relevant sectors.

As highlighted in **European Commission Progress 2018**, Serbia achieved some preparation, but implementation is pending (European Commission 2018). Mentioned preparation includes developing the national cross-sectoral strategy on climate change, harmonized with the EU 2030 framework for climate and energy policies, addressing adaptation to climate change (European Commission 2018). However, as mentioned in the 2018 progress report, better cross-

sectoral integration of climate change actions by the National Climate Change Committee is needed (European Commission 2018).

The Paris Agreement was ratified in May 2017, followed by second communication submission to the UN Framework Convention on Climate Change (UNFCCC) (European Commission 2018). Nonetheless, there is a lack of data accuracy (European Commission 2018).

When it comes to legislation, Environmental Protection Agency in Serbia constantly improves GHG inventories (European Commission 2018). However, Serbia's administrative and technical capacity must be fully harmonized with climate acquis monitoring and reporting (European Commission 2018). Legislation drafting on GHG emissions monitoring, reporting, and verification harmonized with the EU were finalized in 2017 (European Commission 2018). Also, there is a need for stronger administrative capacity (European Commission 2018).

While Serbia increased opportunities through preparations, implementation is still pending. Barriers represent general recommendations mentioned by the European Commission, which remain the same as in the progress report from 2016.

General European Commission's recommendations are (European Commission 2019):

- enhancing administrative and financial capacity over stronger environmental protection agency's monitoring and reporting, and resourcing Green Fund alongside upgrading inter-institutional central and local level coordination;
- Implementation of the Paris Agreement; adopting a strategy for climate change and law, harmonized with the EU 2030 framework, alongside integration within all relevant sectors;
- Develop a National Energy and Climate Plan, harmonized with the obligations of the Energy Community.

As in the previous years, in **European Commission Progress Report 2019,** it is highlighted that Serbia has achieved some preparation, but the implementation is still pending, and it is at the early stage (European Commission 2019). A national strategy on climate change, which includes related sectors and is harmonized with the Eu 2030 climate and energy policies, is yet to be adopted (European Commission 2019).

When it comes to legislation, a public consultation regarding the draft Law on climate change was in 2018, but the adoption still awaits in 2019 (European Commission 2019). Moreover, improvement of the GHG inventories has continued (European Commission 2019). However, also highlighted in previously analyzed reports, Serbia still needs to strengthen administrative and technical capacity to harmonize with the climate acquis monitoring and reporting (European Commission 2019). Furthermore, as previously mentioned, legislation concerning GHG emissions monitoring, reporting, and verification harmonized with the EU emissions trading system and Effort Sharing Regulation was finalized, but its adoption is pending. Moreover, stronger administrative capacity and increased investments in clean energy are necessary (European Commission 2019).

Serbia enters another year with the same concerns and barriers. Due to the unsupported implementation system, policies that can decrease GHG emissions are pending. A few of the barriers are mentioned through reports several times. Administration capacity, cross-sectoral integration, lack of investments, and legal harmonization remain challenging. As mentioned previously, general recommendations remain the same as in 2016 and 2018.

As it is highlighted in progress report 2020, 2019 recommendations are still **valid** with the additional recommendations for 2020 (European Commission 2020a):

- Strengthening the administrative and financial capacity of the authorities, especially the Environmental Protection Agency and environmental inspectorates;

- Utilizing environmental fees for environmental purposes;
- Improving inter-institutional coordination (between central and local levels), alongside developing effectual institutional set-up to manage environmental investments;
- Implementation of the Paris Agreement, alongside adopting a strategy for climate change and law, harmonized with the EU 2030 framework; alongside integration within all relevant sectors;
- Develop a National Energy and Climate Plan, harmonized with the obligations of the Energy Community.

In **European Commission Progress Report 2020,** it is also mentioned that Serbia made progress through preparation, but implementation is still at an early stage (European Commission 2020a). Moreover, there is a lack of development due to a low political consensus regarding the urgency to act (European Commission 2020a). Furthermore, in 2020 the law on climate change is yet to be adopted, alongside the climate strategy and action plan "which is consistent with the EU 2030 framework for climate and energy policies and which addresses adaptation to climate change, is paramount for Serbia's future low carbon development" (European Commission 2020a).

Integration of climate action in other sectors still needs to be improved (European Commission 2020a).

Improvement of the GHG inventories continues. Additionally, Serbia is updating the Nationally Determined Contribution to the Paris Agreement (European Commission 2020a).

Still, the harmonization of "legislation on monitoring, reporting, and verification of greenhouse gas emissions in line with the EU emissions trading system and Effort Sharing Regulation is pending" (European Commission 2020a). Moreover, as already emphasized in previous reports,

there is a need for stronger administrative and technical capacity to report further, monitor, and implement the climate acquis (European Commission 2020a).

As previously mentioned, Serbia is still preparing while the implementation awaits. There are opportunities; however, barriers remain unsolved. Legislative harmonization, administrative capacity, financial investments, and cross-sectoral integration remain unsolved.

3.1.3. Lack of climate awareness as a social barrier in Serbia

One of the problems highlighted in the 2016 Progress Report represents the citizen's lack of awareness (European Commission 2016). As a part of building a higher capacity towards mitigating climate change effects, it is of utmost importance to increase awareness of current climate concerns. Thus, Serbia needs to raise awareness of its citizens to significantly affect climate change mitigation and lower GHG emissions (European Commission 2016).

As mentioned in the previous report, low awareness remains an obstacle in 2018 (European Commission 2018). Therefore, Serbia needs to work on this great concern to overcome current and possible further problems regarding climate concerns and GHG emissions.

Awareness of climate concerns remains low in 2019 (European Commission 2019). Therefore, as this problem enters another year, Serbia must increase the awareness of its citizens. Repetition of this problem may leave consequences that affect political and economic aspects of dealing with climate change mitigation and GHG emissions. This concern has stayed unfixed by now, and it is of utmost importance to urgently take actions towards increased awareness.

3.1.4. An overview by National Convent on political, economic, and social segments of climate and energy interactions

European Commission reported on the development of Serbia in 2019 through **Chapter 27**, and it stated that necessary actions need to be undertaken in 2020 (National Convent for Eu 2020):

- Improve the administrational and financial capacities on National and local levels;
- Strengthen law enforcement related to Environmental protection and Climate change;
- Implement the **Paris Agreement**, including the adoption of climate strategies that are harmonized with the **2030 climate and energy framework**;
- Develop the NECP in harmonization with the Energy Community requirements.

Further recommendations for 2019 for the working group for chapter 27 include the direction of the climate strategy in Serbia towards the EU 2030 framework and as much as possible towards energy saving, energy efficiency, and renewable recourses (National Convent for Eu 2020).

Several actions were undertaken to lower GHG emissions in Serbia, and one of them represents the making of the Low Carbon Strategy (2016) (National Convent for EU 2020). The EU gave financial and technical support for the National Low Carbon Strategy of the Republic of Serbia in 2016 (National convent for EU 2020). Nonetheless, the mentioned strategy still awaits implementation since Serbia is still highly reliant on coal.

Additionally, the Green Fund has been established in 2016 (National Convention on the European Union 2020). Green Fund represents the budget fund that finances projects related to environmental protection (Energy portal 2018). Therefore, every activity related to environmental protection, sustainable development, and green economy should be financed through Green Fund (Energy portal 2018). However, one of the main problems identified is that the Green Fund is not directly coordinating green taxes; taxes and Green fund have been managed by the Serbian Ministry of Environmental protection (National Convention on the European Union 2020). Thus, the allocated funds for environmental protection are much

smaller than they should be (National Convent for EU 2020). Hence, the Green Fund should represent an independent institution that can allow non-impacted financial flow allocated for environmental and climate change mitigation purposes.

Moreover, according to the National convent for EU (2020), a strategy to protect air quality an air protection strategy has not yet been adopted. Therefore, it is important to form plans and monitor processes accurately (National Convent for EU 2020). The urgency of this issue represents a critical problem in Serbia. Therefore, it is of utmost importance to act on this issue.

However, some positive actions conducted by the Ministry of Environmental Protection in Serbia are the increased inspections supervision for large emitters of harmful gases (National Convent for EU 2020). For example, in 2018, the Ministry of environmental protection has done 83 inspections' control and 13 reports on economic offenses; in 2019, there were 94 inspections control for air quality and 12 reports on economic offenses (National Convent for EU 2020).

Furthermore, the Western Balkan countries, including Serbia, are not yet obligated to pay fees for CO2 emissions - however, these payments must be covered as a precondition to becoming a member of the EU (National Convention on the European Union 2020). Therefore, nonexistent CO2 fees represent one of the most critical reasons why Serbia lags behind EU countries, thus EU accession.

When it comes to NERP, it is set to harmonize emissions from large combustions plants until 31st December 2027 according to limits set by the Industrial Emissions Directive (National Convent for Eu 2020). Moreover, even though this plan is formed, it still awaits its adoption (National Convent for EU 2020). Thus, the Energy Secretariat initiated proceedings against Serbia in 2020 for not adopting NERP and lack of contribution towards lowering GHG emissions (National Convent for EU 2020). The Government of the Republic of Serbia was

thereby pushed to adopt NERP on 30 January 2020 (National Convent for EU 2020). However, the adoption of NERP awaited from 2016 (when it was originally formed) until 2020. Now, hopefully, NERP will enable a shift towards making a necessary change with the outcome of lower GHG emissions in Serbia.

Moreover, the implementation plan was set for the Guideline 2010/75/EU on industrial emissions by European Parliament and Council (National Convent for EU 2020). Directive 2010/75/EU on industrial emissions represents "the main EU instrument regulating pollutant emissions from industrial installations" (European Commission 2021b). All the implementation plans will be a part of strategic documents in environmental protection and Climate change (National Convent for EU 2020). When it comes to financial support for the implementation plans, a Multi-Annual Investment and Financial Plan (MIFP) was set; this financial support funds projects (National Convent for EU 2020).

According to the National Convent for EU (2020), current regulations are insufficient to overcome existing problems and lower emissions towards better air quality. They emphasize necessary coordinated strategies and/or plans that are binding, accurate, and represent significant causes of a current and existing situation, alongside solutions and measures for poor air quality, currently filled with GHG emissions (National Convent for EU 2020).

The European Commission warned Serbia about necessary actions that need to be undertaken to mitigate climate change effects, especially throughout lowering GHG emissions (National Convent for EU 2020). European Commission also highlighted that the Law on Climate Change adoption is essential (National Convent for EU 2020). A positive turn represents the fact that this law was adopted at the beginning of 2021. However, the European Commission also emphasized the necessity for a stronger administrative and technical capacity to enable and support adequate monitoring and reporting of current climate problems (National convent for

EU 2020). Insufficient administrative capacity is repeatedly mentioned through all the analyzed documents. Hence, it represents one of the most important barriers Serbia needs to overcome to have sustainable climate policy implementation and reach the already mentioned Paris Agreement goal related to GHG emissions.

Regarding the mentioned air quality concern in Serbia, a working group was set in 2018 by the Ministry of Environmental protection to reduce air pollution. However, the general public is not familiar if this group is undertaking any actions or is even active (National Convent for Eu 2020). Moreover, expert and the general public was not included in decision making in forming, already mentioned, NERP (National Convent for EU 2020).

Furthermore, there are ongoing protests in the most polluted cities in Serbia, while unfortunately, the air pollution still exceeds the records (National Convent for Eu 2020).

National Convent for EU (2020) recommends the development of mandatory public hearings and consultations when planning documents and raising general public awareness of current ongoing climate concerns and GHG emissions (National Convent for Eu 2020). The general lack of awareness remains a significant concern in Serbia, not allowing for positive change to come. This issue has to have an urgent intervention to support further energy transition and decarbonization in Serbia.

One of the positive actions is developing the Action Plan for Administration Capacity Development (APCD), supporting institutional strengthening – employments, training/equipment (National Convent for EU 2020). However, the mentioned plan is not adopted. Furthermore, labor control was initiated because of the excessive air pollution and emissions (National Convent for EU 2020). Mentioned APCD represents an opportunity related to climate policy implementation. If the institutions are strengthened, the decision-making process and implementation can go more easily.

It is highlighted within **Chapter 15** Serbia has incorporated the basics of the EU acquis (National Convent for EU 2020). However, it is underlined that Serbia is not ready for negotiations on Chapter 15 because of lacking the Action Plan that is aligned with the EU standards on reserves of oil and still has to fully unbind gas reserves (National Convent for EU 2020).

When it comes to GHG emissions, as stated in Chapter 15, the Serbian Energy sector cannot increase its CO2 emissions having in mind the Paris Agreement goals that need to be implemented in order not to cause severe consequences regarding foreign policies and the EU accession (National Convent for EU 2020).

Serbia promised to fulfill obligations by 2030, which the Energy Community set regarding the emissions (National Convent for EU 2020). Fulfillment of these obligations will also highly affect the accession to the EU (National Convent for EU 2020). Thus, Serbia is currently deeply involved in Energy Treaty, Paris Agreement, and EU accession process (National Convent for Eu 2020).

Something that needs to be done in Serbia is the establishment of "the Energy Efficiency Fund as an independent financial institution" (National Convent for EU 2020) and initiate the creation of energy cooperatives to solve local problems (National Convent for EU 2020).

When it comes to the legal framework, Serbia needs to constantly monitor its application effects, alongside monitoring strategic energy policies programs (National Convent for EU 2020). It is necessary to harmonize the legislative framework and develop sustainable financing for projects to improve conditions for energy efficiency enhancement (National Convent for EU 2020). As mentioned, the Paris Agreement has already been ratified; thus, the requirements to implement this agreement are already set (National Convent for EU 2020). Something that will affect Serbia is also the high standard of financial investment contributions that all

signatory countries should make (National Convent for EU 2020). However, national contributions indicate that the overall situation is worse than it should be; countries (including Serbia) are not contributing enough toward lowering GHG emissions; in fact, GHG emissions increased (National Convent for EU 2020). Thus, demands for countries will be higher regarding climate change mitigation and GHG emissions (National Convent for EU 2020).

Furthermore, some of the demands are related to coal (National Convention for EU 2020). Opportunities to invest in coal-based facilities would be much smaller since coal use and exploitation credits will be much stricter and tightened (National Convent for EU 2020). Furthermore, emissions of CO2 in the EU will have higher prices to stop investments in large CO2 emitters (National Convent for EU 2020). New strategies for mitigating climate change and lowering GHG emissions will be set at the climate conference in Glasgow in 2021 (National Convent for Eu 2020). While new standards and demands are set, Serbia needs to mitigate climate change further. For Serbia to reach EU demands, it is necessary to increase technical capacity while strengthening professional organizations (National Convent for EU 2020).

Furthermore, it is highlighted that the Serbian Energy sector is currently in financial and material crisis, which will further demand a detailed analysis that would come up with recommendations for improvements in transparency, abilities, and independence of facilities involved in the Energy sector, professional organizations, and public (National Convent for EU 2020). Moreover, the uncertainty of the Serbian Energy market represents an obstacle; it affects efficiency and generates economic and political risks (National Convent for EU 2020). Concerning all the facts stated above, it can be stated that Serbia has set a way towards decarbonizing the energy sector. However, this transition is going slower than it should be. There are barriers, obstacles such as mentioned financial crisis that will not allow decarbonization that easily.

Moreover, as mentioned earlier, at a climate conference in Glasgow, a new agreement will be signed, and Serbia will have to commit to lower CO2 emissions (National Convent for EU 2020). Obligations set in the new agreement will be material and binding (National Convent for Eu 2020). Furthermore, the Energy Community's contract of obligations expires in 2023 (National Convent for EU 2020). Thus, after 2023, it is very likely to expect a high deficiency of electric energy in Serbia (National Convent for Eu 2020).

While this chapter does not focus that much on social aspects affected by the Energy sector in Serbia, a couple of problems are mentioned. Firstly, the main problem represents energy poverty, which can be solved through better energy efficiency (National convent for EU 2020). In that sense, a national program for lowering energy poverty could be helpful (National Convent for EU 2020). The further problem represents the mentioned deficiency of electric energy after 2023, which will likely affect Serbian society. However, although Chapter 15 gives an overview of the current barriers and opportunities of the Serbian energy sector. It does not provide recommendations on solving complex problems such as energy poverty and expected electricity deficiency.

4. An (un)stable path towards a climate policy implementation in Serbia

Interviews, documents, and literature review gave necessary data examined through this chapter to reach the aims and objectives mentioned at the beginning of this research.

As mentioned at the beginning of the study, the interviewees are divided into three groups:

- Public sector;
- CSO's;
- Private sector

Documents were analyzed, and interviews were conducted to understand current political, economic, and social opportunities and barriers as the main challenges in Serbia to comply with the Paris Agreement's goal to decrease GHG emissions, mostly coming from the energy sector. However, to keep the anonymity of respondents that mentioned sensitive information during the interviews, interviewees are not mentioned by name.

This Chapter is divided into the analysis of the documents mentioned in the literature review as main reports, strategies, and policies currently ongoing in Serbia that support decarbonization of the energy sector (first part).

The second part of this chapter contains data on personal communication, interviews, and insight into main political, economic, and social challenges to comprehensively outline the current Serbian climate and energy system.

4.1. Political, economic, and social challenges in essential documents

4.1.1. Low priority of climate change mitigation in the energy sector in Serbia outlined by the Energy Community

As already mentioned, Serbia is a part of the Energy Community. As a member, Serbia has specific tasks and goals to support the creation of a sustainable energy market, as one of the Energy Community's goals. According to the Energy Community Annual Implementation Report for Serbia (hereinafter Energy Community report), a set plan for climate adaptation and mitigation is in the process. However, this process only includes preparation when the actual implementation in Serbia still awaits. There are only comments and critiques on the undertaken and future necessary actions in the Energy Community report, while the guidance plan is missing. Set goals describe the needed change; however, Serbia still has a lot on its plate to overcome to reach the set goals, such as implementing the mentioned NECP. This strategy represents an enormous task for a developing country, especially Serbia. This is because, as mentioned in the Energy Community report (Energy Community 2020b), high reliance on coal, energy consumption, lack of National Emission Reduction Plan, compliance of the Serbian legal and regulatory framework, and implementation of LCDSAP represent the most significant problems. These problems also stand in the way of NECP's adoption.

Initiatives contribute to increasing the share of renewables mentioned in the Energy Community report (Energy Community 2020b). These contributions represent secondary legislation on renewables, higher renewable energy capacities, adopted laws on biofuel, the rulebook on the renewable energy share, Law on Climate change, stronger institutional, procedural arrangements, and administrative capacity (Energy Community 2020b). However, these opportunities represent only the first step that needs larger implementation. Therefore, the legal framework needs to be in line with necessary actions that seek mentioned implementation.

Moreover, the legal framework needs to be harmonized with the required higher renewable share implementation. A big part of it represents the transparency of needed information. Thus, legal support is essential towards transparency, such as support towards continuous national inventories. Besides legal support, Serbia lacks administrational and technical capacity, which can further support policy implementation, such as mentioned NECP, which represents an essential strategy that can highly contribute to decreasing GHG emissions and climate change mitigation. Thus, Serbia's overall political and economic scene needs to prioritize renewable implementation urgently to reduce GHG emissions and mitigate climate change effects in Serbia.

4.1.2. Deeply rooted challenges described by EU Commission

Undertaken actions that serve as an opportunity for the Serbian energy sector to comply with the Paris Agreement represent the ratification of the Paris Agreement; a formation of the National Climate Change Committee; improving GHG inventories; drafted legislation on GHG emissions, the national cross-sectoral strategy on climate change; and NRDCs. However, mentioned opportunities are the steps to be covered in a long path towards reaching the Paris Agreement goal to lower GHG emissions. One of the most significant political and economic barriers represents the general inter-sectoral cooperation that should be stronger in Serbia, especially related to climate change. It still seems that all sectors, not only the ones directly related to climate change mitigation, need integration and better cooperation. Climate change mitigation and a goal of lower GHG emissions should be prioritized, integrated, and serve as a link between sectors, including the energy sector, to support further necessary climate policy implementation.

Moreover, the low technical, financial and administrative capacity represents an enormous challenge that needs intervention. Besides legal support, one of the most significant barriers

represents political consensus regarding the urgency to act. This political challenge represents a barrier that stands in the way of climate policy implementation.

One of the most significant concerns still is the low citizen's awareness of climate change regarding the social aspect. As this concern continues, it is getting harder and more challenging to deal with climate change and enforce climate policy implementation. Serbian society should gain higher climate awareness that can further trigger ripple effects and make policy implementation easier. The political and economic system highly depends on society and its awareness; it represents a crucial step towards making a change. Nonetheless, all of the European Commission's progress reports highlighted the problem's existence, leaving out the actual road map towards solving it. Climate change awareness represents a deeply rooted social problem in Serbia, and it needs step-by-step support and guidance to overcome it. The citizens' awareness does not include the general public only; it includes diverse sectors and their employees that can make an impact. This impact by now has had positive outcomes. However, the negative ones prevail, making climate change mitigation challenging to develop continuously.

4.1.3. Complex political, economic, and social systems represented in Chapter 15 and Chapter 27

Within Chapters 27 and 15, there aren't many positive aspects when it comes to undertaken actions. First, it is mentioned that the basics of the EU acquis are incorporated in Serbia. However, this represents the initial step. Alongside, Serbia has many problems, and one of the main ones concerning the energy sector in Serbia are increased CO2 emissions, financial and material crisis, and energy poverty. These three problems represent a significant challenge that serves as a barrier towards reaching the Paris Agreement's goals. These deeply rooted problems will need an enormous effort and time to solve their complexity. Political, economic, and social

joint efforts are required to overcome the problems. And this is not an easy task. Besides economic crisis, increased CO2 emissions, and present poverty, Serbia still needs to set a plan for oil and gas, lower CO2 emissions, harmonize legislative framework, develop sustainable financing, strengthen technical and administrative capacity alongside professional organizations, and improve transparency work towards energy efficiency.

4.1.4. Summary of reappearances in all analyzed documents

Serbia has set a way towards mentioned decarbonization through preparations of strategies and policies. However, as highlighted, the only progress remains through preparations, and the actual implementation remains low or yet to achieve its accomplishment. Therefore, although mentioned preparations represent positive actions, they are not enough to make a needed change towards energy transition and low GHG emissions.

All the mentioned political, economic, and social challenges represent significant barriers towards Serbia finally complying with the Paris Agreement through energy transition to contribute to climate change mitigation.

The main proposed goals for Serbia remain undone throughout the years. Furthermore, as already mentioned, political and economic challenges are a lack of political will, administrative, technical, and financial capacity of the authorities, institutional coordination, and a lack of an NECP. While social challenges, according to analyzed documents, represent low awareness of Serbian citizens regarding climate concerns, alongside energy poverty.

All the challenges mentioned above represent significant concerns that need urgent intervention. Therefore, to further understand the roots of mentioned problems, 15 interviewees were asked to explain political, economic, and social challenges that either support or stand in the way of fixing a current energy-climate system in Serbia.

4.2. Personal communication's insight on deeply complex political challenges for climate policy implementation and GHG emission reduction in Serbia

As a part of the interviewing process, all the interviewees were asked about political barriers and opportunities related to climate policy implementation in Serbia to lower GHG emissions from the energy sector and comply with the Paris agreement.

As a core of the political aspect of Serbia's climate policy implementation system, one of the most repeated answers from interviewees represents **lack of continuity, political consensus**, **administrational capacity**; **transparency**; **lagging behind** in decision making and implementation, and **inter-sectoral cooperation** as the main barriers.

4.2.1. Lack of continuity, political consensus, and administrational capacity as a political challenge in Serbia

Interviewee #1 (Pers. comm.) highlighted that that the policies related to climate change lack concrete actions. The reason for this vast lack lies in the fact that climate change concerns "have not 'matured' within the decision-making process and decision-makers, in the sense that they do not have a clear and concrete implementation plan" (Interviewee #1 Pers. comm.). Serbia has a strategic framework and was always good in preparations, but practical steps are missing, and the implementation process is going slow (Interviewee #1 Pers. comm.).

A further barrier that interviewee 1#, supported by interviewee #2, #5, and #8 (Pers. Comm.), highlighted that political mandate changes in the government, which occur every four years. Interviewees (Pers. comm.) further explained that the necessary continuity for long-term planning, which can take up to 15 years in order to implement climate policies, is never set due to the political elite bringing new, often changes. Moreover, when dealing with climate change and the energy sector, changes do not come fast; the outcome cannot be seen right away and is

not that clear. Thus, this also represents an obstacle to the implementation process and its effectiveness.

Moreover, capacity cannot be built without continuity. As interviewees #2 and #8 mentioned, mandates in Serbia do not allow continuity; they offer frequent change and additional adaption towards an entirely new set of the institutional and working framework. A situation with the chosen new political elite continuously requires a fresh start (Interviewee #2 and #8 Pers. comm.). Interviewees #1, #2, and #5 (Pers. comm.) highlighted that without continuity, many required knowledgeable staff are not kept in public administrations where they should be.

When asked how to change this ongoing problem related to administrational capacity, interviewees #1, #2, #4, #5, and #14 (Pers. comm.) answered that people, in order to be kept in their workplace, need to have motivation. Mentioned interviewees (Pers. comm.) further explained that the lack of motivation lies in low wages, prolonged working hours, lack of space to contribute, slow or nonexistent implementation.

4.2.2. Lagging behind in decision making and implementation as a political challenge in Serbia

Interviewees #2, #4, #5, #8, #10, #11, #12, #13, #14 and #15 (Pers. comm.) mentioned that the EU had started working on climate change policy implementation long before Serbia, which affected that this issue is the priority on the agenda.

Interviewees stressed that the last six months represent a positive change in Serbia, especially due to the Law on Climate Change adoption. However, as one interviewee said, this law was prepared for a long time and was "left in the drawer, and I would not dare to say that it gives an optimistic prognosis, because if something was done, it was done with the huge delay and is yet to represent a basis for further development" (Interviewee #9 Pers. comm.). Interviewees (Pers. comm.) further highlighted that we must not be satisfied with laws adopted with the five

or six years' delay because we need to make up for everything that has not been done yet. Furthermore, and most importantly, "it might happen that all of those laws remain on a bureaucratic level, while the implementation never happens" (Interviewee #9 Pers. comm.). They (Pers. comm.) further mentioned that this law would make climate policies implementation easier over time. However, interviewees (Pers. comm.) also highlighted the uncertainty of exactly how and when this law will make needed positive change. One of the interviewees (Interviewee #10 Pers. comm.) also mentioned:

> The Law on Climate Change represents a bicycle without wheels. Firstly, this law will not decrease GHG emissions because it does not have any mechanism to allow it. Secondly, in this law, the GHG emission decrease was not mentioned, only its limitation; the opportunity in this law represents the GHG emission permits, but it is not defined who can and cannot have this permit. Thus, the effect of this law remains unknown and 'immobile' like a bicycle without wheels. (Interviewee #10 Pers. comm.)

As the core of the previously mentioned problem regarding the Law on Climate Change, interviewees #5, #7, #8, #10, #13, and #15 (Pers. comm.) mentioned energy dependency. As mentioned interviewees (Pers. comm.) further explain, Serbia thrives on being energy independent by keeping coal as the main source of the energy system, and moving towards a huge change as a transition towards renewables requires political decisions and will (Pers. comm.; Serbia Business 2021). One interviewee highlighted: "I don't believe in political decisions that are not based on expert support, and I think that the problem here is vice versa, where political decisions are based on investor's interest" (Interviewee #9 Pers. comm.). The interviewee further highlighted, "national strategic questions are the key, and we have to approach them from experts' position, not from 'daily politics' position" (Interviewee #9 Pers.

comm.). One of the interviewees (Interviewee #7 Pers. comm.) further explained this problem, saying that this energy independence will last for only a specific, short time. However, after that, Serbia does not have an alternative.

4.2.3. Transparency as a political challenge in Serbia

Interviewees emphasized that the issue of transparency represents a critical problem in Serbia that needs to be resolved. The political scene in Serbia has always been stable when it comes to strategic planning, legal framework, and collecting necessary information (Interviewee #2 and #5 Pers. comm.). However, the transparency of the source of this information, which represents the base of policymaking, and if it is revised or not, is unknown (Interviewee #2 Pers. comm.). Further barriers related to transparency mentioned by interviewee #5 (Pers. comm.) represent that the biggest polluters in Serbia are most likely faking the data on GHG emissions. For example, one interviewee highlighted that the "health of people nor emissions are included in the price of extracting coal, and there is a possibility to hide the real amount of that coal" (Interviewee #7 Pers. comm.).

Further issues with transparency in Serbian climate policy were brought by interviewee #8 (Pers. comm.), who highlighted that the political scene is not oriented towards climate change. The interviewee said:

> The whole political system is with no plan. Politicians function according to the corporative insertions, and you have an unshown assumption that real politics is flowing in the air somewhere. It might seem weird when I say this; however, this real politics is floating in the air without being formally adopted anywhere, and we have no power in it. (Interviewee #8 Pers. Comm.).

Thus, making policy implementation hard and not transparent enough. Therefore, there is a clear need for increased transparency.

Moreover, Serbia relies on international or EU agreements and policies related to climate change and transition towards renewables. However, as mentioned by interviewee #13 (Pers. comm.) Serbia does not have a plan, agreement, or strategies that could transfer promised obligations on a national level. Hence, creating and adopting a policy such as NECP remains undone. When asked about NECP, most interviewees (Pers. comm.) highlighted this plan would not come easy due to the complex social, economic and political system in Serbia that is not ready for the energy transition.

4.2.4. Inter-sectoral cooperation as a political challenge in Serbia

All the interviewees mentioned poor inter-sectoral cooperation. Because climate change affects everyone and every sector, it requires a holistic approach and inclusion of all sectors, not only the ones who are related directly to it. Interviewees highlighted that this inter-sectoral cooperation needs to be better and more efficient in Serbia to implement climate policies and take actions to bring Serbia a step closer to the green energy system. Cooperation between ministries and municipalities is also lacking, so the knowledge 'flow' necessary for policy implementation is basically stopped (Interviewee #2 Pers. comm.). Nonetheless, interviewees (Pers. comm.) were unsure how and what would improve the needed cooperation. They mentioned that the complexity of the Serbian system does not allow changes to come that easily. All sectors in Serbia still 'stand on their own' with their own interests, where climate change and reaching the Paris Agreement GHG emission goal is not a priority.

4.3. Personal communication's insight on deeply complex economic challenges for climate policy implementation and GHG emission reduction in Serbia

As a part of the interviewing process, all the interviewees were asked about economic barriers and opportunities related to climate policy implementation in Serbia to lower GHG emissions from the energy sector and comply with the Paris agreement.

Interviewees mentioned the **high price of the energy transition**, **unsustainable economic system that does not support investments in the green economy,** and a **nonexistent carbon tax system** as the main economic barriers.

4.3.1. High price of the energy transition and unsustainable economic system that does not support investments in the green economy as an economic challenge in Serbia

As one of the main barriers towards low GHG emissions and energy transition, all the interviewees (Pers. comm.) highlighted the high price awaiting this vast change. The interviewees further emphasized that mainly projects can influence, but they are also costly and do not ensure continuity. When asked about opportunities, interviewees #1, #2, #3, #4, #5, #7, #8, #10, and #13 (Pers. comm.) mentioned that projects have the most positive influence. However, mentioned interviewees (Pers. comm.) also highlighted that the allocated funds are not provided in continuity, and the positive effects last only until the project's ending. Hence, mentioned interviewees (Pers. comm.) emphasized that it is essential to provide continuous financial sources directed towards energy and climate policy implementation.

Furthermore, these possible projects do not have a substantial effect that can be seen right away. When investing all that money, current assets and cost-effectiveness are usually asked for (Interviewee #2 Pers. comm.). Furthermore, these projects require grants, and the state should cover them (Interviewee #2 Pers. comm.). Nonetheless, to cover it, interviewees #7, #8, #10, and 13 (Pers. comm.) further emphasized that there is supposed to be a source for it, and that source would probably come from citizens through climate fees. Those climate fees would likely constantly grow (Pers. comm.).

Most interviewees (Pers. comm.) emphasized the existing 'seesaw' between the economy and climate change. As one of the interviewees #13 highlighted, the Serbian economy is strictly profit-oriented, and there is no place for climate change and energy transition in that system.

One of the interviewees mentioned that everything that requires 'ecological behavior' has more costs than other 'dirty alternatives' (Interviewee #9 Pers. comm.). Thus, as interviewee #9 (Pers. comm.) further emphasized, Serbia cannot have fast positive results; instead, it is highly dependent on economic development, not only GDP but also salaries and economic position of citizens. As most interviewees (Pers. comm.) mentioned, due to the high reliance on coal, Serbia is bound to invest in resources to maintain supply security. Thus, no one is giving a financial plan of energy transition towards renewables. Interviewee #5 (Pers. comm.) emphasized that the energy sector is not calculating the costs of the upcoming transition and not realizing its urgency. Moreover, interviewee #8 (Pers. comm.) mentioned a tremendous financial loss as he said between 3 and 6 billion euros only to extract emissions and climate change in Serbia. As interviewee #8 (Pers. comm.) further explains, Serbia plans to invest between 3 and 6 billion euros in mines and thermal power plants, significantly contributing to GHG emissions increase.

4.3.2. Carbon tax system as an economic challenge in Serbia

Interviewees (Pers. comm.) highlighted that Serbia still does not have a carbon taxes system. They further emphasized that carbon taxes will be adopted in Serbia this year, representing an excellent opportunity to lower GHG emissions, especially those coming from the energy sector.

However, interviewees #1, #2, #4, #5, #7, #8, #9, #10, #11, #13, #14 and #15 (Pers. comm.) highlighted that mentioned taxes mean a higher cost for every citizen in Serbia, not only for big polluters, which is, as previously mentioned in the social barriers, a problem for already poor people in Serbia. Thus, climate change and decarbonization do not represent a priority for the economy of Serbia.

As an economic opportunity, interviewees #4, #5, #7, #8, #12, and #13 (Pers. comm.) highlighted the Green Agenda for the Western Balkans, which promises 9 billion euros of allocated funds for green development.

4.3. Personal communication's insight on deeply complex social challenges for climate policy implementation and GHG emission reduction in Serbia

As a part of the interviewing process, all the interviewees were asked about social barriers and opportunities related to climate policy implementation in Serbia to lower GHG emissions from the energy sector and comply with the Paris agreement.

As a core of the social aspect of Serbia's climate policy implementation system, one of the most repeated answers from interviewees represents low citizen's **awareness** and **energy poverty** as the main barriers.

4.3.1. Low awareness as a social challenge in Serbia

Low awareness in Serbia is based on not understanding climate change and how it affects nature and people. As interviewees (Pers. comm.) repeatedly said, people in Serbia might have heard about it but did not understand its meaning. They further mentioned (Pers. comm.) there are many ongoing projects with the aim to raise awareness. However, people remain clueless about this problem (Pers. comm.). The core of continuity of climate unconsciousness in Serbia lies in the fact that its citizens are poor and naturally would care about their wellbeing first, which is very understandable. However, the society in Serbia has 'worse' problems that affect their everyday life and survival other than learning about climate change and what they can do to help with its mitigation. When asked how will citizens in Serbia accept the upcoming energy transition towards renewables, all the interviewees (Pers. comm.) answered, saying that people will not take it lightly, mainly because the energy transition will have the most effect on the poorest population in Serbia.

Furthermore, the beginning of the transitions will have the most potent effect when transitioning towards renewables because it is extremely expensive. "Policies related to climate change are

not ‘popular’, especially because the majority of climate expenses are paid by the poorest, while the actual polluters don’t pay their price” (Interviewee #1 Pers. comm.). Moreover, interviewee #1 (Pers. comm.) mentioned that when it comes to climate change, people in Serbia always think there is, or will be, someone else who needs to take care of climate concerns. People in Serbia are aware that their country is not rich; thus, it does not make sense for Serbia to deal with it as already developed and wealthier countries do (Interviewee #1 Pers. comm.). Serbia will probably make a necessary change when it has to and after everyone else does (Interviewee #1 Pers. comm.).

Term climate change remains abstract, and it is still hard for people in Serbia to understand it (Interviewee #2 Pers. comm.). If simple words and explanations were used, people in Serbia would have a greater understanding of climate change (Interviewee #2 Pers. comm.). Furthermore, low awareness further affects interest in implementation of climate actions or projects related to GHG emissions and the Serbian energy sector (Interviewee #2 Pers. comm.). All the interviewees confirmed that awareness represents one of the core problems in climate policy implementation in Serbia. Thus, if awareness was higher, implementation would also be more significant.

One of the main reasons for the lack of climate awareness lies in low educational opportunities. One of the interviewees said, “citizens in Serbia realized that climate change represents reality, but they have the problem understanding in which way is climate change affecting them and their surroundings” (Interviewee #9 Pers. comm.). Interviewee #9 (Pers. comm.) further mentioned that represents the most significant problem related to awareness because education and awareness-raising campaigns are absent, especially related to climate change adaptation. The term adaption is new, even nonexistent in Serbia (Interviewee #9 Pers. comm.). Furthermore, interviewees (Pers. comm.) mentioned that the climate change adaptation would

not include only citizens but the economy and diverse sectors that impact nature (Pers. comm.). Hence, a lot of effort needs to be given to making educational campaigns and programs that can explain climate change through simple words and how it affects people's lives in Serbia, mainly through energy poverty.

However, even though not enough, interviewees #3, #4, #5, #6 and #12 (Pers. comm.) confirmed that awareness of climate change did rise, which might further affect Serbia's preparedness for necessary change, including energy efficiency and energy transition towards renewables. Mentioned interviewees (Pers. comm.) further emphasized that there are ongoing protests in Serbia related to emissions and its effect on people's health; thus, the interest in climate change is higher. Interviewee #6, as one of the prominent leaders in protests against building small hydropower plants and fighting for climate change mitigation, described his experience:

> I was first lonely in my fight, but I was recognized by individuals and institutions in Serbia. I was further supported by the media and many more. Then, of course, there was formal and informal pressure on us to stop, such as lawsuits. But I stayed consistent; young people, especially students of the Faculty of Forestry, University of Belgrade, gave enormous support (Interviewee #6 Pers. comm.).

Even though this social movement had a rocky road towards more success and more supporters, it represents an opportunity for people to understand climate change and realize that the energy system in Serbia needs to change for the better.

4.3.2. Energy poverty as a social challenge in Serbia

Interviewees (Pers. comm.) mentioned that Serbian society is not yet ready for such significant changes as energy transition would bring. Moreover, because of the excessive energy poverty in Serbia, it cannot be expected of people to think about climate change when they live from

day to day trying to provide for themselves and their families (Interviewee #8 Pers. comm.). In this regard, interviewee #8 (Pers. comm.) highlighted:

> The basic and fundamental representation of Serbia's energy sector incapacity is dramatic energy poverty. Even though I have a stable job and a stable salary, I am energy-poor too, and I am spending a lot more money on energy than earning. Most Serbian citizens spend 10% of their energy, and I am sure that at least 70% of people in Serbia are energy poor, which further concludes that the Serbian energy sector is catastrophically planned (Interviewee #8 Pers. comm.).

One of the interviewees (Interviewee #10 Pers. comm.) explained energy poverty as an enchanted circle. Serbia's energy poverty was not represented as a problem for a very long time (Interviewee #10 Pers. comm.). Only now, the energy-poor population is being recognized through Law on efficient use of energy in Serbia (Interviewee #10 Pers. comm.). The Ministry of Mining and Energy in Serbia set the policy that helps the energy-poor population in Serbia through subvention measures (Interviewee #10 Pers. comm.). However, these measures only include citizens who use electricity for heating, while most people in Serbia still use wood (Interviewee #8 and #10 Pers. comm.). Thus, Serbia ends up with more GHG emissions, and people are still energy poor, leaving the mentioned enchanted circle intact.

In contrast, every year, Serbian people still use wood, and the electricity stays out of reach, and the problem remains unfixed (Interviewee #8 and #10 Pers. comm.). As an opportunity, interviewees #7, #8, #9, #10, #11, #15 (Pers. comm.) mentioned that energy efficiency would decrease energy poverty, of course, as one part of complex problem-solving. Mentioned interviewees (Pers. comm.) further explain that because people in Serbia are spending more than they should, efficiency solutions would decrease energy poverty. Furthermore, there are very practical challenges when it comes to energy poverty, and they are very much rooted in

mentality, so educational elements represent one of the key solutions (Interviewee #11 Pers. comm.).

As mentioned by interviewee #8 (Pers. comm.) energy sector is not coordinated well enough towards needed energy transition. Moreover, interviewees #5, #8, #9, #10, and #13 (Pers. comm.) highlighted that the Serbian energy sector does not have a stable plan and 'alternative offers' for people who work in the coal industry in Serbia. As repeatedly mentioned throughout this study, the energy sector represents one of the most important industries in Serbia, which means many people are employed working in the mining and coal industry. All of them will remain without a stable job if the energy transition happens (Pers. comm.). Thus, Serbia needs to propose a plan on how to include everyone. One of the interviewees emphasized that "many people who work in the energy sector have a salary above average than other Serbia sectors" (Interviewee #5 Pers. comm.). The interviewee further highlights "thus, a further transition towards green energy and rationalization of working places would lower this part, because it is not only one person employed there, it is, in fact, a whole chain of supply and trade" (Interviewee #5 Pers. comm.). Therefore, it seems that Serbia is not expecting the energy transition to happen soon since the plan for social changes that this enormous transition is demanding, is in fact, nonexistent. From this, the main conclusion is that Serbia expects to proceed with the current, heavily coal-reliant system for a longer time than it should.

5. Discussion

As mentioned previously, the base of this study represents analyzed documents and essential data that came from interviews. It is important to emphasize and show where these two overlap and oppose each other to fully describe political, economic, and social challenges related to the energy sector in Serbia and climate change mitigation through lowering GHG emissions. Analyzed documents show an outline of policies, strategies, and reports, where various problems, barriers, and opportunities were presented. However, interviewees explained why and how the mentioned challenges stand as barriers or opportunities in Serbia. Interviews further explain why is current Serbian system is in the 'status quo', as repeated many times through this research, in preparation, while the climate policy implementation is going slow or lacks completely. This chapter gives a comprehensive overview of analyzed documents, qualitative data, and the literature of other authors.

When it comes to **political challenges**, as mentioned through documents, the main barriers represent administrative capacity, institutional coordination, and a lack of an NECP. Interviewees emphasized that these do stand as the main barriers, but these concerns are not explained in detail throughout analyzed documents. As a result, analyzed documents lack the reasons and explanation for the development of such a political system that does not fully support climate policy implementation. Interviewees further explained that for administrational capacity and implementing a complex strategy such as NERP, continuity needs to be set. So far, mentioned lack of concrete actions, climate change has not matured within decision-makers, and constant change of political elite that requires a fresh start does not allow continuity to be set. As one of the authors said, Serbia will introduce climate change mitigation and adaptation strategies, but "a national decision-support system for implementation of the climate change law and strategy is yet to be developed" (Vranic et al. 2021). Moreover, the

administration capacity throughout the years remains low; this lack further impacts implementation success (Shundovska and Jovanovic 2020).

Furthermore, something that is not mentioned within analyzed documents and is brought up as the political barrier represents the lack of strength of laws in Serbia. For example, in analyzed documents, Law on Climate Change represented a must-do action in Serbia; it also is a great opportunity to reduce GHG emissions and decarbonize the energy sector. However, the interviewees explained this law as a bicycle without wheels, bringing the uncertainty of how and which positive actions this law will bring. Another barrier mentioned by interviewees represents lagging when compared to the EU, especially regarding climate policy implementation and supporting the enforcement of the Paris Agreement. This barrier can be recognized in all the analyzed documents through a comment brought up repeatedly about how Serbia did some preparations, but the actual implementation is slow, or it even lacks. Thus, Serbia moves slowly towards its climate policy related to the energy sector implementation (Young and Macura 2020).

Further concerns represent low transparency and inter-sectoral cooperation. Brought up within analyzed documents and explained by interviewees, these concerns represent enormous barriers deeply rooted in the Serbian political system. Unfortunately, neither analyzed documents nor the interviewees gave an example of the opportunity to solve mentioned concerns regarding transparency and inter-sectoral cooperation. In order to have a multidisciplinary and holistic approach, all the energy subsectors should also have better cooperation in order to push and enhance climate policy and GHG emissions lowering implementation (Baleta et al. 2019). Moreover, the transparency issue remains a huge barrier in climate policy implementation as there is a "complete disregard for transparency matters from Serbian authorities" (Lucic 2018). There is a current, ongoing Transparency Framework in Serbia project that could be a potential

opportunity to help to solve the mentioned issue (UNDP 2019b). As described, "the project supports the Government of Serbia in strengthening the methodologies and tools necessary to enhance transparency as described in Article 13 of the Paris Agreement" (UNDP 2019b). However, this is only one project, while the political decision-making is lagging behind and not giving enough support to make a necessary change towards decarbonization. Thus, "there is a need to change the traditional methodology of planning and develop a new one which is capable of dealing with the dynamics of climate change and which will use certain climate indicators when making decisions related to space" (Filipovic and Duskov 2019).

Even though information from analyzed documents overlaps with data gathered from interviews, it does not give a road map towards sustainable climate policy implementation, nor it highlights useful opportunities. General recommendations from analyzed documents only emphasize the actions that need to be done. However, an action plan or a road map lacks. Serbia needs political support to overcome climate change concerns, especially GHG emissions, which, as mentioned previously, exceed sustainable limits. "Differing pressures from climate change, air quality, congestion, safety, or energy security are likely to influence the time and scale of policy responses, but institutional and political structures determine the consistency and continuity of policy action" (Lah 2017). Without solid political support and structure, the climate policy implementation process remains slow or nonexistent. The complexity of the current political system in Serbia brings many already mentioned challenges that stand in the way of decarbonizing the energy sector and decreasing GHG emissions.

Financial capacity is mentioned as the leading **economic** barrier within the analyzed documents. Interviewees confirmed that the mentioned barrier represents an enormous challenge within the Serbian economic system. As they further emphasized and explained, Serbia represents a small country that is not rich enough to support significant changes such as energy transitions. The

enormous economic price of energy transition still represents the main barrier of including renewables in the energy system (Christophers 2021). As they further explain a lack of financial capacity, interviewees highlighted the already mentioned 'seesaw' between ecology and economy, including the energy sector. They explained that the opportunities to strengthen financial capacity to support the decarbonization of the energy sector represent projects. However, the investments stop as soon as the project ends. Thus, having an unsustainable investment system in climate-related projects can further allow climate policy implementation continuity and financial stability. The core of this problem represents that climate change, nor decarbonizing the energy sector and decreasing GHG emissions, do not represent a priority for Serbia and its economy. Policies that bring decarbonization of the energy sector, besides allowing the energy transition to come, might also affect economic growth (Burandt et al. 2021). However, the more resistant countries, such as Serbia, might have an even worse economy and lower GDP due to the persistence of the system staying profit-oriented (Burandt et al. 2021). A high dependency on coal also represents an economic barrier; "the largest part of the energy reserves fossil fuels of the Republic of Serbia (about 99%) are various types of coal" (Energy Community 2016). Even though this represents a critical problem, as mentioned by interviewees, no financial plan is made or planned for the energy sector to comply with the Paris Agreement.

A further concern that is highlighted in the analyzed documents and by interviewees represents a nonexistent CO2 tax. Within the analyzed documents, this problem is brought up as a concern. However, a reason behind it and the implementation process is lacking. Interviewees added that carbon taxes would be enforced in Serbia. Nonetheless, they emphasized that these taxes will be adopted for everyone in Serbia, not only for the big polluters. This can be a barrier for a carbon tax system enforcement in Serbia due to the mentioned poverty. Hence, the economic system of Serbia will not take this tax lightly. Energy Community (2021b) emphasizes

expectations that Serbia will be easing carbon pricing have different renewables inside the energy system, and have low or/and free carbon products by 2030. However, the Serbian economic system is not fully supporting these high expectations and demands.

As already mentioned, one of the opportunities brought by interviewees represents The Green Agenda for the Western Balkans, which contains five following sections: climate action, which includes **decarbonization**; circular economy; biodiversity; lowering air pollution and sustainable food systems (European Commission 2020b). In addition, this agenda strongly supports the transition towards climate neutrality and a low-carbon economy (European Commission 2020b). This opportunity can represent a positive turn for Serbia. If used well, this agenda can support the decarbonization of the Serbian energy sector.

Within most of the documents, also confirmed by interviewees, most repeated concerns represent low citizen's awareness and energy poverty as the leading **social** challenges in Serbia. Mentioned challenges represent the main social barriers that stand in the way of climate policy implementation and the energy sector decarbonization.

Low awareness has been highlighted within the analyzed documents as a significant concern that has been continuously developing throughout the years. Interviewees explained this major challenge saying people in Serbia do not understand climate change, even though they might have heard about this global problem. The positive side represents that the people in Serbia realize that climate change is an important concern, but this issue remains insufficiently important and far (Cvetkovic and Grbic 2021). During the interviews, interviewees repeatedly mentioned that people in Serbia might not have the will to further understand climate change, and the energy sector's effect on it, due to excessive poverty. As already mentioned, they have greater concerns to worry about within their lives rather than taking actions on mitigating climate change on a personal level. Thus, awareness remains low, affecting further climate

policy implementation. This problem remains deeply rooted in the mentality, while other issues unravel, making lowering GHG emissions even harder. Therefore, developing a climate-aware and ready adaptation society represents an urgent issue that will further make positive changes (Pietrapertosa et al. 2018).

Moreover, "considering the awareness of our society, process of energy efficiency growth and switching to renewable sources would be time-consuming, followed by the need to implement radical and systemic changes at the state level and organizational system level, which would produce effects in the future" (Boljevic and Strugar Jelaca 2016). As already described in political and economic challenges within the documents, low awareness is represented as a concern. Still, the action plan or opportunities to fix this problem are not given. Interviewees mentioned that the ironic opportunity that's currently developing in Serbia. People are protesting due to the low air quality, filled with GHG emissions, and during that process, they further affect the situation with awareness. Due to the protests, awareness is higher.

Nonetheless, it still is not enough to make a necessary ripple effect and provide a conscious society in Serbia. Other authors confirmed that even though Serbia made progress towards achieving environmental goals such as lowering GHG emissions, the actual implementation remains insufficient due to low awareness of climate concerns (Stupar and Mihajlov 2016). Various awareness-raising campaigns should be responsible for that. But, as interviewees highlighted, those campaigns are present in a small amount, not giving a significant effect, or even nonexistent. The exchange of information and knowledge about climate change and the effects of the energy sector and its application in the process of lowering GHG emissions needs to be prioritized in Serbia (Stupar and Mihajlov 2016). Serbia needs to develop educational programs and heighten the awareness of climate and energy concerns (Filipovic and Duskov

2019). Educational programs should be aimed towards the benefits of renewable energy and energy sector decarbonization (Pekez et al. 2016).

A further concern that is mentioned in the documents represents energy poverty. Interviewees gave a detailed insight regarding this concern, saying that energy poverty is not appropriately, or at all, recognized and dealt with. "Energy transition in Serbia is not just about the energy mix, the technology or emissions. It is a process that has to be preceded by a change in society that then leads to a more profound transformation of society" (Young and Macura 2020). Unfortunately, due to the high reliance on coal, Serbia persistently insists on maintaining this unsustainable system, postponing needed energy transition. As an opportunity, interviewees highlighted energy efficiency. "Although energy efficiency is an option to address these issues simultaneously, its link to social aspects, in particular energy poverty, is a topic that has been rarely analyzed, especially in the context of energy sector reforms in transition countries" including Serbia (Stadtmüller 2014).

Moreover, the opportunity for energy efficiency goes to people in Serbia who rely on electricity while most of the Serbian population still relies on coal. One interviewee described this as an enchanted circle, emphasizing this situation rather as a formality than a real opportunity that can make a positive change. Still, Serbia remains energy-poor, with an excessive 70% of the population that suffers from it. In that matter, this disproportionate percentage of energy poverty is present in 70% of Serbian households and needs to change (Vilenica 2017). Moreover, "high energy consumption due to low energy efficiency can have negative financial effects on households, particularly if incomes are low" (Stadtmüller 2014).

A further social concern brought by interviewees represents a considerable amount of people working in the coal and mining sector. An estimated number from 2016 represents 24,169 people working in the mining sector in Serbia (World Bank Group 2020). And, if energy

transition was to happen, there is no alternative plan for these people. In the end, they would end up without a job. The instability of the social, complex system in Serbia does not allow change. People remain clueless while trapped in their jobs, thinking if a positive environmental change such as energy transition would come, it would highly and negatively affect their lives, which is valid due to the mentioned nonexistent alternative plan for job opportunities. Serbia decided to stop constructing one thermal power plant, representing the first step towards energy transition (Balkan Green Energy News 2021). Nonetheless, closing only one thermal power plant does not mean Serbia will close coal-fired power plants and mines overnight, "but rather marks the beginning of a process that will take decades" (Balkan Green Energy News 2021). From this, the main conclusion is that Serbia expects to proceed with the current, heavily coal-reliant system for a longer time than it should.

6. Conclusions

Serbia has set a path towards climate policy implementation by ratifying the Paris Agreement. However, there is still a gap in mentioned implementation due to the excessive increase of GHG emissions from the energy sector in Serbia. Thus, it is crucial to understand the main challenges that either support or stand in the way of climate policy implementation in Serbia. This study gives a coherent overview of political, economic, and social barriers and opportunities in Serbia.

Various document analyses and 15 interviews with public, private, and CSO sectors are conducted to encompass the challenges in Serbia related to the energy sector and climate change mitigation through lowering GHG emissions.

Documents mainly gave an insight into barriers and opportunities, giving recommendations for Serbia on which goals and actions need to be implemented. However, these documents did not provide a road map towards implementation, nor the reason for complex political, economic, and social issues. Hence, interviewees were asked to explain various challenges represented in this study.

As the main political barriers interviewees emphasized:

- lack of continuity in decision making of the government due to the frequent political changes;
- lagging behind in decision making driven by investments in coal;
- political consensus and the will on the urgency to act;
- low administrational capacity;
- low transparency in policymaking and its implementation;
- poor inter-sectoral cooperation.

Interviewees did not mention opportunities that could be potential solutions to mentioned problems. Instead, they explained why and how these issues are currently present in Serbia.

An ongoing Transparency Framework in Serbia project represents an opportunity to allow higher transparency of policymaking and implementation.

As the leading economic barriers interviewees highlighted:

- the high price of the energy transition;
- nonexisting carbon tax system.

It needs to be highlighted that the carbon tax system represents a barrier and an opportunity at the same time. As an opportunity, it represents a system that can further decrease GHG emissions by putting a price on it. As a barrier, these taxes might not be accepted lightly due to higher prices that Serbian society will not take lightly. Interviewees mentioned that funded international or EU projects represent the economic opportunity, alongside the Green Agenda for the Western Balkans.

As the main social barriers interviewees emphasized:

- low citizen's awareness about climate change and the energy sector's effect on it;
- excessive energy poverty.

As an opportunity to overcome mentioned social barriers, interviewees mentioned educational programs and energy efficiency.

Existing opportunities do represent a positive turn when it comes to climate policies implementation. However, they are not enough. The whole system can be described as an enchanted triangle. This triangle consists of political, economic, and social, complex issues overlapping and depending on each other. The analyzed documents show the perplexing system

in Serbia that does not allow for change to come that easily. The interviewees confirmed that this system would not support sudden changes but rather in the long term. However, the time needed for these changes requires continuity and social, political, and economic reforms that may not come easily. The economy needs a transition towards sustainability and ecology; however, the political system does not support that. Society is not aware of the current climate problems and has greater concerns such as poverty. The energy poverty in Serbia represents a significant problem that will further unravel into catastrophic concerns related to climate change and society's well-being. The request of the EU for extreme changes in Serbia seems impossible at this moment when the political scene does not allow coal removal and the introduction of renewables; the economy cannot support expensive transition; while society is unaware and suffers in poverty.

Serbia is mostly implementing climate policies through projects, especially the ones supported by international donors. From this stand of point, these projects can have a crucial implementation role and represent an opportunity. However, it is unsustainable to rely only on projects. Thus, the public sector in Serbia has to be more integrated into climate mitigation and adaptation actions and needs to strengthen its financial, administrative, and technical capacity. This is no easy task, and small changes can make a leap towards a necessary transition Serbia has to make. Sustainable economic, political, and social systems have to prioritize solving climate policy implementation barriers in Serbia. Through the support of the EU, Serbia can take action towards needed climate and energy transition. However, this still seems highly unlikely to happen any time soon. Fundamental systematic changes are necessary to support a sustainable functioning system in Serbia that can prioritize climate change mitigation and lowering GHG emissions.

The required actions of all Paris Agreement signatory countries demand a high standard. As mentioned above, Serbia is a small country that should have a stronger social, political, and economic development to reach this standard. However, as seen through analyzed political, economic, and social contexts of Serbia's climate and energy system, Serbia does not prioritize climate change mitigation through the energy sector. Moreover, Serbia will stay persistent to keep coal as the primary source, while renewables remain an idea that will come along but in the long run. This may also be seen as a positive thing since, as seen through documents and interviews within this research, Serbia plans to introduce renewables in the energy system at some point. However, it seems that that time is not soon enough.

To conclude, climate change does not represent a priority for Serbia, especially in the energy sector. This being said, it will be tough to introduce a necessary change and decarbonize the energy sector. Described enchanted triangle has too many overlaps, and needs to be unraveled with many solutions, not only a few such as Transparency Framework in Serbia project, mentioned green agenda, the Law on Climate Change, educational campaigns, etc. It is not enough to rely on positive changes that make a small effect, compared to those that appear as negative ones. Energy poverty; policies that exist pro forme and that never meet implementation; low awareness; low transparency within decision making; mentioned dirty alternatives, and no alternatives that can support the upcoming energy transition represent enormous barriers that, unfortunately, have more influence than mentioned opportunities. As further problems, recommendations and obligations accumulate, it is unlikely that Serbia will reach the Paris Agreement goal to lower GHG emissions by 2030.

To give recommendations to improve this situation is close to impossible since the interactions between political, economic, and social problems are extremely tangled and complex. However,

there are recommendations, but unfortunately, a road map or an action plan towards them would have to be completely new research.

Given all that has been said, it would be essential to implement further recommendations:

- develop educational campaigns for awareness-raising;
- Serbia needs to give its society an opportunity for energy efficiency (not only the ones who depend on electricity but also people who depend on coal);
- allow continuity that will further strengthen administrational capacity;
- strengthen climate and energy law enforcement;
- use the Green Agenda for the Western Balkans towards decarbonizing the energy sector;
- Improve transparency of decision making;
- prioritize climate change mitigation in the energy sector in Serbia;
- recognize, prioritize, and develop a strategy only for energy poverty.

These recommendations represent crucial actions that need implementation in Serbia.

For further research, it is important to highlight that energy poverty in Serbia needs to be studied more. As mentioned in this research, energy poverty is not recognized enough and not researched enough. At least 70% of people in Serbia are energy poor, even though they might have stable jobs and solid salaries. This concludes that the energy sector in Serbia needs to plan the energy consumption differently; thus, it needs to rationalize the energy use and rely more on energy efficiency. Energy efficiency opportunities and solutions in Serbia also need to be a more important subject of future researches. Besides these issues, transparency, continuity, and inter-sectoral cooperation can be further examined to find appropriate solutions. It might be possible to find affordable solutions through research instead of just giving recommendations and demands without an action plan or the mentioned road map towards implementation.

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