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Implications of EU Accession for Renewable Energy Investments in the Balkans

The cases of the Republic of Bulgaria and the Republic of Serbia

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Abstract

The topic of energy, and particularly, the growing role of renewable energy sources in decarbonizing the economy dominates European political and research agendas. Similarly, a revived political interest in Western Balkan countries from the European Union (EU) sheds light on the longstanding efforts of legislative harmonization and the modernization, decarbonization and integration of the regional energy infrastructure. This thesis investigates the impact of EU membership on energy investments in the Balkan region, using Bulgaria and Serbia as case studies. Energy investments are dependent on the investment climate and the investor type. By identifying the key factors in the literature that influence these two variables, this thesis provides an in-depth overview of the socio-economic context, the legislative frameworks in place, and the contemporary energy profile in a comparative format. Supplemented with insights from regional experts, this thesis compares an EU member state (Bulgaria) with a non-EU member state (Serbia) while factoring the influence of characteristics, such as a historical centrally planned economy, coal-fueled electricity production, a level of perceived corruption and a techno-economic potential for renewables. Nonetheless, the findings show distinctive features that consequentially help explain the difference in the energy investment landscape. While significant legislative and investment involvement from the EU is not without its faults and contradictions, this thesis concludes that EU membership has previously, and may further provide the financial mechanisms and policy frameworks necessary to enable a considerable growth in renewables deployment in the Balkan region.

Keywords: Renewable Energy, Investments, European Union, Bulgaria, Serbia, EU Enlargement

Executive Summary

International climate and energy commitments, technological innovations and decreasing prices are all forces driving an increase in the deployment of renewable energy technologies. As a global leader in the renewable energy market, the Europe Union provides the legislative framework, financial incentives and long term political commitments aimed at creating a favorable investment climate for the deployment of renewable energy sources within its member states. In this regard, this study aimed at investigating the effect of EU membership and accession on energy sector investments particularly aiming at RES deployment in the Balkans, using Bulgaria and Serbia as case studies.

The scope of this study was determined by the pertinence of the results for potential future EU accessions in the Western Balkan region. A literature review allowed the identification of key factors including the socio-economic context, the legislative frameworks, and the energy profile. The analytical framework than highlighted the role of these factors on two variables, investment climate and the investor type, that determine energy investments. Following semi-structured interviews, assessing statistical data, and undertaking a literature analysis, the study deconstructed the stated factors and examined the influence of EU membership on these factors. The conducted interviews helped contextualize and bring up-to-date the previously sought findings regarding the differentiated roles of the private and public sectors, as well as the influence of the EU on the legislative frameworks in place in the Balkan region. By comparatively assessing the results of Bulgaria and Serbia's growth in RES deployment, shared socio-economic characteristics and legislative frameworks, implications were drawn on the EU's influence on energy investments.

The findings helped answer the central research question and concluded that EU membership does have an impact on energy investments, particularly through its influence on national legislation and investments. Nevertheless, the extent of this impact is limited when considering the influence of other key factors. Moreover, this thesis confirmed that the regulatory framework is a key determinant on the investment climate, particularly in a time when RES deployment and energy reforms are principally driven by policy. By examining the role of the selected factors in defining the investment climate and investor type necessary for renewable energy investment and deployment growth, this thesis supplements the literature on energy investments, particularly in the Balkan region and provides both research and policy recommendations.

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Abbreviations

RES – Renewable Energy Sources

RE – Renewable Energy

SDG – Sustainable Development Goals

EU – European Union

IRENA – International Renewable Energy Agency

IEA - International Energy Agency

OECD – Organization for Economic Co-operation and Development

UN – United Nations

FDI – Foreign Direct Investments

FIT – Feed-in-tariffs

CESEE – Central, Eastern and Southeast Europe

EBRD – European Bank for Reconstruction and Development

1 Introduction

Although fossil energy has and continues to fuel economies worldwide, it is the largest emitter of greenhouse gases causing climate change. In order to mitigate climate change, fossil fuels should be replaced by low-carbon sources, including renewable energy. This is one of the reasons global investment in renewable energy sources (RES) has experienced unprecedented growth in recent years, with 2017 being the eighth year in a row in which global investment in renewables have exceeded $230 billion (McCrone, Moslener, D'Estais, & Grüning, 2018). Though instrumental in achieving the Paris Climate Agreement objectives as well as the seventh goal (Affordable and Clean Energy) of the Sustainable Development Goals (SDG), these investments fall short of the levels required to stabilize atmospheric concentrations of greenhouse gases at safe levels. The European Union (EU), is the second largest market of Renewable Energy (RE) investments after China. The EU relies on policy instruments and fiscal incentives to promote energy investments and achieve both national and the Union-wide 20% RE target by 2020. Through its Energy Union strategy, the EU puts forward five mutually reinforcing priority areas including decarbonization, research, energy efficiency and security, and regional integration ("Building the Energy Union," 2018).

Taken the EU's central role in investment in the Balkan region and palpable geopolitical interests, the EU has searched to reenergize its political commitments to the Western Balkans, which stretch from Albania to Bosnia and Herzegovina (referred throughout as Bosnia), and across Serbia, Macedonia, Montenegro and Kosovo[1] (Dabrowski & Myachenkova, 2018; Emmott, 2018). The clear pro-enlargement ambitions of Bulgaria's EU Presidency, as well as the European Strategy for the Western Balkans advanced by the Commission's President Jean-Claud Junker suggests renewed efforts to rival major influencers in the region and preconizes a pathway to membership as early as 2025 for the six Western Balkan states; Serbia and Montenegro being considered as the most likely to achieve this in the given timeline (Barber, 2018; Peel & Buckley, 2018; Peel & Kynge, 2017). In the context of the EU's rapprochement to the Balkan region, and its energy priorities that require the rapid decarbonization of EU members, a question about a comparable availability and presence of funding mechanisms and investors to both member and aspiring-members arises.

The aim of this thesis is to investigate the effect of EU membership and accession on the energy sector particularly aiming at RES[2] investments and deployment in the Balkans, using Bulgaria and Serbia as case studies.

Located in the Balkan region, the Republic of Bulgaria joined the EU in 2007. Since 2004, it has experienced the doubling of its share of RE, with a significant increase post-EU accession. Furthermore, it is among the few EU member states to have already achieved their 2020 targets ("Eurostat: Share of RES 2004-2015," 2017; "SHARES (Renewables) - Eurostat," 2016). In contrast, the Republic of Serbia which is searching to both join the EU and meet its national energy targets in the next decade, is struggling to provide the necessary institutional stability to undertake the decarbonization of its energy sector. Despite important investments in the energy sector, i.e. Serbia sharing the 10th position with Norway in terms of wind energy investments destination in Europe, the Balkan country is set to fail to achieve its 2020 targets (Pineda, Pierre, & Miró, 2018). The EU has made clear signals of association between the

[1] This designation is without prejudice to positions on status and is in line with the ICJ Opinion on the Kosovo decleration of independence.

[2] This thesis uses the term "RES" to designate all renewable energy sources (primarily wind, solar and biomass) used for electricity production except hydro power.

Balkan state's value to the Energy Union agenda and the potential availability of various funding mechanisms, including through the European Investment Bank ("Serbia: EU plans to involve Serbia in Energy Union | EnergyWorld Magazine," 2015).

1.1 Objectives

Driving the research is the following research question:

> Does EU membership have an impact on the energy sector, particularly renewable electricity investments, and, if so, to what extent?

To achieve the stated aim and answer the main research question, this research will examine the investment environment of both Bulgaria and Serbia in relation to their energy sector and the development of their renewable energy capacities. Furthermore, this thesis will use both qualitative and quantitative data to assess whether EU membership provides the institutional stability that draws market stability to attract investments in renewable energy electricity production projects. In the process, the following sub questions will be addressed:

- What are the existing legislative structures, regulatory mechanisms, and other preconditions that foster or hinder RES development in Serbia and Bulgaria?
- Who is financing the energy sector, and specifically RES projects in Serbia and Bulgaria?
- What is the scale and scope of energy investments, especially in RES, in both countries?
- What is the future for RES investment in these countries?
- Are funding mechanisms sufficient drivers for increasing RES deployment?
- Does the EU membership have a noticeable effect on investments in the energy sector, particularly in RES, in Serbia and Bulgaria?

1.2 Research Scope, Approach, and Limitations

This research covers two countries of southeast Europe, the Republic of Bulgaria, and the Republic of Serbia. This approach allows to delve in the distinctive characteristics of the countries in a comparative format, formulating the necessary results to draw conclusions and assess the relevant implications. This research integrates the analysis of existing literature (articles, scholarly studies, and public documents), interviews, and statistical data to perform calculations necessary to achieve research objectives. The scope of this this research will not evaluate whether RES developments are sufficient, but rather to investigate the relationship between EU membership and investments in the energy sector. Recognizing important variations across EU members states, this study has no intention of creating aggregated distinctions between EU and non-EU member states. Rather, it seeks, through a comparative study, to highlight the strengths and limitations of EU membership and assess potential implications around energy and EU neighborhood discussions. To do so, this thesis will compare data from the Republic of Bulgaria and the Republic of Serbia, conduct semi-structured interviews with experts, as well as a literature review on renewable energy and energy investments, particularly in the countries concerned. While this thesis is primarily focused on renewables, it is also open to investigate investments in other energy sectors for comparative purposes. Databases that compile Foreign Direct Investment information per sector, and per country of origin contribute to the compilation of results. While most of the literature deals with RES deployment, FDI analysis and energy investments separately, this study aims to work at the intersection of these topics in order to study the potential impact of

EU membership. This research may raise the interest of those involved in the energy sector who seek to gain an overview of the investment environment in Southeast Europe as well the trends and implications inferred. Further interest may be for those who wish to enable the development and deployment of renewable energy sources in the region and those interested by the EU's enlargement in the region across both private and public sectors.

1.3 Disposition

The thesis is structured as follows:

Chapter 2 consists of a literature review on renewable energy investments and use, as well as some background on the Foreign Direct Investment (FDI) theory. It further provides the context for renewable energy investments in the Balkan region and highlights the EU rapprochement to it. Ultimately, it provides the foundation to the identified variables that come into play in the analytical framework.

Chapter 3 presents the analytical framework including the rationale behind the case and variables selection. Furthermore, it covers the data collection methods and thesis limitations.

Chapter 4 lays out the results and explores the socio-economic and legal characteristics of the case studies as well as their energy profiles and investment flows. It also covers a regional outlook which take note of the EU's relevant institutions and funding mechanisms. Furthermore, it integrates the interview responses.

Chapter 5 focuses on the interpretation of the results and discusses their implications, both nationally and regionally.

Chapter 6 offers concluding reflections and recommendations for future research.

2 Literature Review

The topic of "global renewable energy investments and consumption" has received significant attention from around the world and is the subject of multiple annual reports by international institutions such as the International Energy Agency (IEA), the Organization for Economic Co-operation and Development (OECD), the United Nations (UN), and the International Renewable Energy Agency (IRENA). The first section of the literature review examines reports compiled with aggregated data to establish the rationale and status quo of RE investments and consumption around the world. The section then identifies studies that have investigated the determinants of renewable energy development, and the relationship between foreign direct investments, energy consumption and CO2 emissions. Finally, it differentiates the value and nature of investor profiles in renewable energy. This section helps situate the need for and implications of investments in renewables on RE consumption, and the important factors involved in evaluating the investment climate and type of investors involved in energy investments. As instrumental sources for funding, the second section explores the variability of FDI data trends and RES development in Southeast Europe in view of connecting it to the findings of the previous section. Moreover, the second section provides key information around the influence of the European Union in the Balkan region and provides a general perspective of the investment climate in both Bulgaria and Serbia though a country risk report. Ultimately, the second section helps to shed light on and contextualize the gaps of energy investment and development literature in the Balkan region. Overall, the literature review helps identify the necessary element that feed into the key variables that come into play when investigating the impact of EU membership on energy investments in the Balkans.

2.1 Rationale behind renewable energy use and investments

The 2017 annual report published by REN21, a global renewable energy policy multi-stakeholder network, provides a comprehensive perspective on the status of renewable energy developments around the world. It notes that the ongoing growth of renewable energy is driven by the continued decline in prices for renewable energy technologies, growing energy demands and supportive legislative mechanisms. With over 176 countries adopting renewable energy targets in 2017, feed-in tariffs and premiums, are and remain the most widely used form of regulatory support mechanism for RES. As an increasing number of European countries are supplementing FITs with tender-driven policies, around 86% of all new power installations in Europe are RES projects (Sawin et al., 2017). Taken the scope of this study, another key document, the 2018 report on Global Trends in Renewable Energy Investment gives valuable insight on the current investment trends in Europe. While global investments in RE have reached over $230 billion for the eighth year in row, Europe has experienced an important decline, primarily due to policy changes in the UK and Germany. This said, it pointed out to the plentiful availability of finance in mature markets, and the record amounts institutional investor funding into RES projects in 2017. Furthermore, the report suggests that the shift from government-backed price support (such as FITs and green certificates) to auctions supported by private sector long-term power purchase agreement (PPA) may lead to a "sink or swim" environment. Technologies, such as wind and solar, where almost all costs are upfront and thus highly conditional on cheap capital, may face important financing challenges (McCrone et al., 2018). Nevertheless, reports by the IEA, the OECD and the IRENA prescribe important investment needs to achieve a low-carbon energy transition and consequentially provide the core justifications driving RES investments. To limit the global mean temperature, rise to below 2°C with a probability of 66%, CO2 emissions would need to peak before 2020 and fall by more than 70% from today's levels by 2050. In such a scenario,

renewables and energy efficiency would meet over 90% of emission reduction needs and any further delay would increase investment needs, multiply stranded assets, and require the use of costly technologies to remove carbon from the atmosphere (OECD/IEA & IRENA, 2017). According to the IRENA, an average close to $700 billion annually would be necessary to achieve the decarbonization of the energy sector by 2050. This echoes the urgent call by leading academics and political figures for an increase of the world's renewable energy production to 30% by 2020 (Figueres et al., 2017). The EU, which has been at the forefront of global renewable energy deployment and doubled its share of renewable energy in the past decade, reaching 17% today, would need to increase this share to 70% by 2050 to meet long-term decarbonization commitments (Gielen et al., 2018). To contextualize such scaling up of investments, Alagappan (2011) explores the successful determinants of renewable energy developments by reviewing data on 14 different markets in the United States and Europe. The study suggests that markets that use a FIT tend to have a higher number of renewable energy developments than those that do not. It attributes five factors to be central to the viability of a RES project. These are site location, ability to connect to existing grid facilities, price premium for renewable generation, long-term revenue stream (i.e. PPA) and a flexible transmission tariff (Alagappan, Orans, & Woo, 2011).

While various reports explore the investment outlook of renewable energy, existing literature stresses the role of foreign direct investments. Due to several factors including access to capital, technology transfer and overall improvement of investment environment, foreign investments are claimed vital for clean energy funding. Foreign Direct Investments (FDIs) are defined by the United Nations Conference on Trade and Development (UNCTAD) as "an investment made to acquire lasting interest in enterprises operating outside of the economy of the investor". The literature gives place to three motivational foundations for such investments: market-seeking, which seeks to promote and exploits new markets, resource-seeking, which seeks to acquire or secure raw materials and energy sources in short supply at home, and efficiency-seeking, which seeks lower-cost locations for operations. This said, the market-seeking motivation is the most relevant to the growth of RES investments in countries (Hanni, Van Giffen, Kruger, & Mirza, 2011). Investigating the contribution of FDI inflows to clean energy uses, CO2 emissions and economic growth through a panel regression approach with G20 economies during 1971–2009, Lee (2013) failed to find any relationship between FDI and clean energy use (Lee, 2013). Another study that disaggregated FDI inflows and examined the impact of these FDI flows on renewable and non-renewable industrial energy consumption sources found that mining and financial service FDI discourage non-renewable industrial energy consumption. The study, which covered 74 countries for the period 1985–2012, further found that economic growth consistently favored higher energy consumption (Doytch & Narayan, 2016). A study investigating the impact of both FDI inflows and stock market developments on clean energy use and energy efficiency measures across 20 emerging market economies between 1991 and 2012 concluded that by enhancing the use of advanced technologies in clean energy production and energy efficiency, FDI inflows and stock market developments have a considerable positive effect on clean energy consumption, and significantly reduce CO2 emissions (Paramati, Ummalla, & Apergis, 2016). Extending the scope in a secondary study, Paramati (2017) empirically explored the extent of both domestic and foreign capital on clean energy uses across the EU, the G20, and OECD from 1993 to 2012. This study further concluded that that both FDI inflows and stock market developments play a significant role in promoting clean energy across all country groups, and confirmed that clean energy consumption had a considerable positive and negative effect on output and CO2 emissions, respectively, across all three groups (Paramati, Apergis, & Ummalla, 2017). Having shed light on the link between foreign investments and clean energy use, the scope of this study demands to delve into the nature of investments made. As such the 2018 report by IRENA and the Climate Policy Initiative provides a detailed insight on the

global landscape of renewable energy finance. Among the highlighted trends is the fact that while public finance plays a significant enabling role in early-stage project risk and getting new markets to maturity, over 90% of renewable energy investments originate from the private sector. Furthermore, it can be noted that private investors overwhelmingly favor domestic renewable energy projects and that public spending on policy implementation far outweighs direct public investments, particularly in Europe where $14 billion were accounted in investments while $66 billion towards policy implementation (Buchner et al., 2018). Developed from the results of the Global Landscape report, Mazzucato (2018) suggests that not all sources of finance have the same impact on RE, and that public actors not only invest in far riskier portfolios, but also account for an increasing share of total investment (Mazzucato & Semieniuk, 2018).

2.2 Investments and renewable energy development in the Balkans

Energy investments in the Balkan context have only sparsely and under restricted scopes attracted attention in literature. No specific study has looked at Serbia nor Bulgaria under such conditions. With a notable absence of RES investment literature on the Southeast Europe, the report published by the Vienna Institute for International Economic Studies which explores FDI data from Central, Eastern and Southeastern Europe (CESEE), provides a valuable insight in regional and national trends. The report notes that FDI inflows fluctuate more than before and have lost their close connection with economic growth or changes in the business environment. Furthermore, countries that have become EU members have attracted significant amounts of market-seeking and efficiency-oriented FDI and have benefited from the expected positive impacts (Hunya & Schwarzhappel, 2016). While the report emphasizes the drop in FDI in CESEE – except for the Western Balkans, as well as Austria persistent domination of inflow of FDI in Serbia, it does not categorize nor delve into a sectorial approach of energy investments as aimed by this thesis. In this thesis, literature on energy investment and RES deployment is linked with literature on the Balkan region, and when possible, on Serbia and Bulgaria. When investigating the EBRD's activities in the Western Balkan's energy sector, Buzar (2008) found that the inability of the region to switch to less carbon intensive energy sources and the significant inefficiencies of energy production, transmission and consumption are the two major energy challenges of the region. It attributes these failures to the private and public sectors' inability to capitalize on renewable energy sources as well as the EBRD's poor investment record. This said, it adds that through the EBRD's environmental policies, technical assistance and funding activities, the bank has played a major role in driving the economic, infrastructural, and legal development of the Balkan region. Ultimately, the paper points to the lack of legal frameworks and political commitments, a narrow private sector, and considerably smaller representation, both in scale and number, of renewable energy or efficiency projects as key factors influencing the EBRD's funding activities (Buzar, 2008). The narrow scope of research fails to assess the regions links with the EU. More recently, a working paper published by the EBRD in 2016 provided some key insights on energy, foreign investments, and the EU perspective of the western Balkans. The paper points to a relative lack thereof institutional maturity needed for high levels of long-term productivity, as well as the region's long-term EU perspective as being a major plus in helping to anchor market-oriented reforms and European standards. Furthermore, despite the energy sector's under-investment, poor management and a non-commercial approach to operations, the modernization of existing infrastructure and the building of new energy facilities, along with an increased inclusion of RES through private sector involvement is set to have significant positive effects on the unexploited potential of energy developments. The paper also stresses the expected growth and value of FDI as enhanced inflows from less traditional sources such as the Gulf countries and China accumulate (Sanfey, Milatović, & Krešić, 2016). Dabrowski (2018) explores the economic ties that bind the EU and the western Balkans. Demonstrating the EU's dominance as largest source of incoming FDI in the region,

it suggests that progress in EU accession ay bring even more European FDI (Dabrowski & Myachenkova, 2018). A multi-stakeholder initiative funded by the EU stressed the negative potential effects of private energy sector magnets and the region's coal addiction when considering the region's plans of investing $30 billion in the decade after 2013 (Taso et al., 2013). Exploring the determination of FDI in the Balkans, Estrin (2013) demonstrates the sharp increase of FDI in the decade after 2001 experienced by the majority of countries in Southeast Europe. While it denotes the role of the institutional environment in attracting and securing FDI, it also establishes a positive correlation between announcement of EU membership and FDI (Estrin & Uvalic, 2013). While the study delves into the variations due to the size of Southeastern European economies, distance to Western Europe, institutional quality, and prospects of EU membership, it does not explicitly consider the impact of EU membership on FDI, let alone in the energy sector, post-EU accession. Stankov (2015) effectively assessed the determinants of FDI flow in Serbia and Bulgaria by activity sector. It concluded that the interests of foreign investors in Bulgaria and Serbia has grown due to an improved investment environment and rapprochement with the EU. Nonetheless, corruption remains among the leading factors hindering more investments. Radenkovic (2016) goes into depth about the FDI context of Serbia and converges with Estrin and Uvalic (2013) in terms of both the institutional influence on the investments climate and the dominance of EU sourced investments. The paper condemns the fiscal behaviors of multinational in Serbia, and points to the disproportionate subsidies attributed to them (Radenković, 2016). Searching to complement European commission and energy community annual progress reports, the report by SEE Energy provides a thorough overview of energy use, electricity production by source and relevant recommendations for each Balkan country (Sustainable energy: How far has SEE come in the last five years?, 2016). This said, the document does not provide any insight on investments or specific rates of RES deployment. Dunjic (2016) analyses renewable energy developments in the western Balkans. While considering EU membership, the study focused on the rate of RES deployment independent of energy investments across different countries. Showing inconsistent development of RES for countries outside of the EU in the region, the study suggests that the increase in volatility of RES consumption proportions and institutional setbacks inhibit increased investment in renewable energy in the region (Dunjic, Pezzutto, & Zubaryeva, 2016). Consequentially, this thesis aims to supplement such findings by investigating the investments that result in such volatile results. Brnabic (2015) argues that the utilization of renewable energy sources in Serbia and the region is far below the level projected and committed to by these countries as contracting parties in the Energy Community Secretariat. Moreover, the low number of projects is not due to a lack of interest among investors and independent power producers but rather due to economic, political, and social barriers (Brnabic & Turkovic, 2015). In order to link the investment environment on a country basis to the literature, the 2018 Country and Sector Risk report serves as valuable resource in describing the business contexts, strengths and weaknesses of both Serbia and Bulgaria. More importantly, it contributes to the development of the defining factors that establish the investment climate and the type of investors involved. The report uses a letter and number code as indicator of the countries' risk factor and business climate, placing Bulgaria ahead of Serbia in both categories (*Country and Sector Risks*, 2018). A report commissioned by the European Parliament in the end of 2017 on Serbia′s cooperation with China, the European Union, Russia, and the United States of America further provides a picture of Serbia′s macroeconomic relationships. The report examined these relationships in terms of foreign aid, trade, FDI and security. With the EU being the single largest investor in Serbia, the report notes that mere accession talks have empirically reflected with FDI increase in the country. Moreover, it covers the decrease of overall Russian investments and emergence of Chinese presence in the country(Hartwell & Sidlo, 2017). It concludes with policy recommendations to various EU institutions and thus contributes to the conceptual need for an EU responsibility to act taken their regional influence.

2.3 Summary

The significant attention on global investments in renewable energy is reflected in the number of reports published annually by international organizations. Particular attention is brought on investment scenario-building to respect the Paris Agreements. In terms of the impact on foreign investment on clean energy development, the literature makes clear the existing positive relationship between the two. Relevant reports also demonstrate the valuable different roles of both private and public sectors in financing projects and securing the market's accessibility. The literature relies on FDI trends to provide a partial picture of the investment climate in southeast Europe. Additionally, it manages to shed light on the EU's significant direct and indirect roles in the region's economic and legislative environments. Furthermore, the literature provides a varied picture of RES development across the region due to legal and socio-economic conditions. While the first section helps frame the need and determinants of energy investments, the second section highlights the contextual challenges and the fragmented literature on energy investments, particularly renewable energy, in either Serbia or Bulgaria. Whereas information on the business climate and the stakeholders involved is plentiful, the literature only very superficially delves into the energy sector investment climate.

Table 1 Variables affecting investments in energy, particularly renewables

Categories	Findings from the Literature	Resources
Legal/Policy Frameworks	Lack thereof institutional maturity in Western Balkans	(Sanfey et al., 2016)
	"Institutional quality" as a factor FDI determinants in Balkans	(Estrin & Uvalic, 2013)
	Institutional setbacks in Western Balkans	(Dunjic et al., 2016)
	price premium for renewable generation, long-term revenue stream – Key factors of success	(Alagappan et al., 2011)
Socio-Economic Context	Poor management, non-commercial approach to operations in Western Balkans	(Sanfey et al., 2016)
	Private sector as energy magnets in the Balkans	(Taso et al., 2013)
	Prospect of EU membership, size of economy in Balkans impacts FDI inflow	(Estrin & Uvalic, 2013)
	EU membership attracts more FDI	(Hunya & Schwarzhappel, 2016)
	Corruption hinders FDI in BG and SRB	(Stankov & Markov, 2015)
	Energy sectors' under-investment, Foreign investments in the Western Balkans	(Sanfey et al., 2016)
	EU's dominance of FDI in Balkans	(Dabrowski & Myachenkova, 2018)
	EU, US, Chinese and Russian FDI in Serbia	(Hartwell & Sidlo, 2017)
	FDI has positive impact on RES consumption	(Paramati et al., 2016)
	Investment type/source	(Buchner et al., 2018)
	FDI in Serbia and Bulgaria by Sector	(Stankov & Markov, 2015)
Existing Energy Profile	Grid modernization, and need for new facilities in Western Balkans	(Sanfey et al., 2016)
	The Balkans' energy sector coal addiction	(Taso et al., 2013)
	Renewable energy developments and volatility of RES consumption proportions in the Balkans	(Dunjic et al., 2016)
	Barriers to RES development in Serbia	(Brnabic & Turkovic, 2015)

This literature review highlights the fact that the literature does not specifically look at RES development from an investment perspective in the Balkan context. This said, it allows the identification and extraction of several elements from the literature that feed into three defining variables visualized in table 1. These variables are the socio-economic background, the legal/policy frameworks in place, and the existing energy profile. The literature has demonstrated the value of these variables in different instances. By delving into these variables, this research will provide some implications for scholars interested in the deeper linkages between economic reform, environmental problems, and the socio-economic ramifications of energy sector developments.

3 Analytical framework

3.1 Theory

To comparatively assess the impact of EU membership on energy investments in Serbia and Bulgaria, the following analytical framework is used.

Investments are dependent upon the investment climate and on the type of investor involved. Theses variables are defined by various macro and micro social, economic, and environmental factors. Through the converging of themes and results in the literature, three categories of factors that influence the investment climate and investor type were extracted. These categories will hereafter be referred to as key factors. These key factors are 1) the socio-economic context, 2) the legal/policy frameworks, and 3) the energy profile. For the purpose of scope and comprehensiveness, this thesis adopts a nation-state-based approach when examining the four factors. The socio-economic reactions to energy disruptions or scarcity reveal lasting implications on the energy profile and infrastructure of a country. In the case of Serbia, it is reflected by a significant dependence on coal-power power plants, while in Bulgaria, it is reflected by a dual omnipresence of coal and nuclear. Furthermore, the socio-economic context entails the examining of national and foreign actors across both the public and private sectors, as well as their associated investments. The significant influence of the socio-economic context on the formulation, implementation and enforcement of the legislative frameworks concretizes its relevance as an essential factor to consider and highlights the relevance of the latter. Characterized by location-specific factors that feed into perceptions of risk, a strong investment climate is the result of country's authorities formulating, implementing, and enforcing an appropriate set of policies (Mills & Fan, 2006). Consequentially, scaling up renewable energy capacities can only happen if supported by clear, credible, and long-term policy frameworks that shift the risk-reward balance in favor of less carbon-intensive investment (Global Investor Coalition on Climate Change, 2010). The legislative context thus plays a central role in defining a country's investment climate. The legacy of energy infrastructure, the availability of natural resources and the recent and ongoing development projects represent various elements that constitute a country's energy profile. As the energy profile provides the basic skeleton from which new projects and investments are considered, examining it is an essential element in the evaluation of the two variable and the overall thesis aim. The selection and significance of these factors is further justified by their susceptibility to the influence carried by EU membership. Core principles of the EU, including the free flow of capital, goods, services, and people, provide defining features that stimulate both the investment climate and the types of investor. By committing to climate action, subsidizing research in new technologies, and deploying support mechanisms and fiscal incentives for renewables, the EU aims to limit the risk factor, improve the profitability of projects, and provide a secure and democratic market access to investors. Recognizing the various mechanisms put in place to secure investments, the literature would suggest the ensued investments would lead to a larger deployment of renewable energy projects. The overarching analytical framework can be visualized in figure 1. To assess and draw some conclusions on the extent of the impact of EU membership on energy investments, a comparative methodology between a member state and non-member state is adopted, in this case Bulgaria and Serbia respectively. While no two countries are identical in all factors but energy investments, as the scientific method would suggest pursuing (I.e. an experimental group and a control group), these countries exhibit several similarities and the notable difference of EU membership, to draw evidence-based conclusions.

3.2 Case selection

The Republic of Bulgaria and the Republic of Serbia were identified and examined as case studies for a variety of reasons. The regional focus on the Balkans, as established in the introduction, stems from the geopolitical interest of the region in terms of energy access, security, and integration as well as opportunity to contrast a member state and non-member state in a context of renewed EU accession efforts. Furthermore, taken the concentration of potential EU accessing countries in the region, the case studies may provide relevance for other countries. Being both located in southeast Europe, the republics of Bulgaria and Serbia share cultural ties as well as a similar overall population number. A history of centralized planning and vertically integrated energy systems also characterizes the two nation-states. Extending beyond the socio-economic context, the two countries share some similarities in energy profiles. Despite important geographical differences, they display a historical and contemporary dependence on coal, though more important today in Serbia. Their overall energy consumption is comparable with a slightly higher percentage in Bulgaria. Legislative changes related to energy have been undertaken since the establishment of the Energy Community treaty in which both Serbia and pre-accession Bulgaria were contracting parties. Since then, Bulgaria joined the EU along with Romania during the sixth enlargement in 2007. In contrast, Serbia officially launched its negotiation process in 2014 and has since then opened 12 chapters of the *Acquis Communautaire*. Demonstrating similarities in socio-economic context, legislative frameworks, and energy profile, this thesis will investigate whether EU membership as an independent variable has a measurable impact on energy investments. Taken that the two countries project different 2020 RES share targets - 16% for Bulgaria and 27% for Serbia – solely examining the progress towards the achievement of these targets would not serve as a sufficient nor objective measure of the impact of EU membership on energy investments. Examining the factors in each of the two case studies will allow the developing of conclusions and assess the due implications.

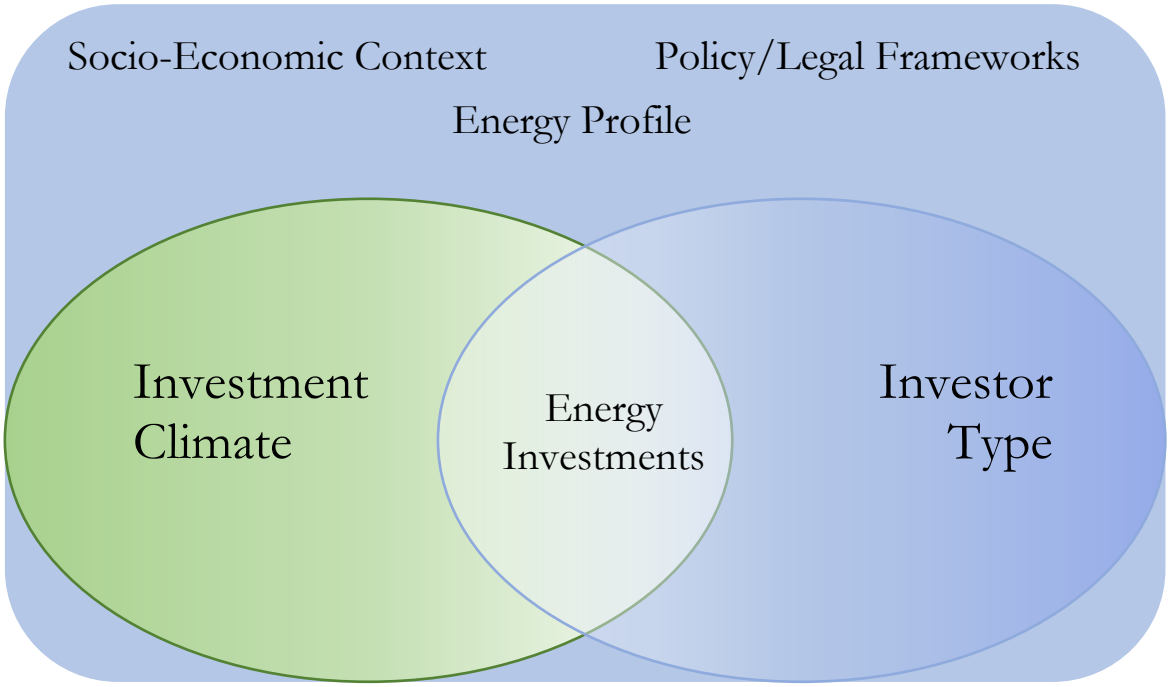

Figure 1. Analytical framework for examining the impact of EU membership on energy investments

3.3 Variables

The two variables that define energy investments are the investment climate and the investor type. The three factor that were identified in the literature that influence these two variables and that will be explore in depth to answer the research question are 1) the Socio-economic Context, 2) the Policy/legal frameworks, and 3) the Energy Profile. In the context of this thesis, the Socio-Economic Context scopes the historical and contemporary influences on the development and current state of the energy system. It includes the country's foreign and national energy actors, as well as data on investments, particularly in electricity production from renewable energy sources. The Policy/Legal Frameworks consists of the laws, regulation, and frameworks adopted in relation to renewable energy. The Energy Profile is comprised of the existing energy infrastructure, energy production and usage data, and an outlook on natural resources available. Taken the scope of the study, the section will mostly cover the production and consumption of electricity. As suggested by the literature, these factors are intrinsically linked. The thesis has determined the dependent/independent factor relationships as visualized in table 2. Concretely, the policy/legal frameworks are dependent upon the socio-economic context which creates them. The energy profile is dependent upon the socio-economic context and the policy/legal frameworks in place. Both the investment climate and investor type are dependent upon the energy profile, the policy/legal frameworks, and the socio-economic context. This thesis will focus on the highlighted factors as a means to assess the two variables that determine energy investments.

Table 2 explores the dependence between key factors.

Dependent Factors	**Independent Factors**
Energy Investments	- Investment Climate - Investor type
Investment Climate	- Socio-economic context - Legal Frameworks - Energy Profile
The Investor Type	- Socio-economic context - Legal Frameworks - Energy Profile
Socio-economic context	- Historical energy developments - International Community
Legal Frameworks	- Socio-economic context
Energy Profile	- Socio-economic Profile - Legal Frameworks

3.4 Method and Limitations

The primary methods used in this thesis are a literature review, semi-structured interviews, statistical data analysis in the context of two comparative case studies. The literature review serves as a starting point in providing a broad overview of key elements and prospects that determine renewable energy investments in Serbia and Bulgaria. Taken the intersectionality of the topic, the literature review includes a broad range of materials (including journal articles, books, reports, working papers, and policy documents) retrieved from institutions' websites, search engines and research databases including (but not limited to) Elsevier, Science Direct and SpringerLink. Furthermore, an extensive review of the latest press releases, articles, and other mentions of investments made contributed to the development of the findings. Publicly available data was used to identify trends and a triangulation process of sources and information enabled the mapping out the stakeholders, the magnitude of investments made, and the energy source it fueled. In the process of examining the investment climate, several established indicators and indexes were used, including the corruption perception and Doing Business indexes. Reports published by chambers of commerce, NGOs, think tanks as well as international organizations and governments all served as indicators of investments made in Bulgaria and Serbia. Much of the information used was qualitative by nature but supported with statistical data when possible. The intension was to develop a range of diverse sources offering both factual and analytical perspectives. Gaps in the data is prevalent in terms of the scale of energy investments in the two countries, as disaggregated data is not available. This said, databases such the UNCTAD do provide a useful though incomplete picture of institutionally-funded projects. Furthermore, this study faced the difficulty to compare data on the same unit of measure due to varying definitions of units. This is reflected in the lack of the quality of the information available. To accommodate to the limitation, data from the World Bank, the IEA, the National Bank of Bulgaria and Serbia, Eurostat and secondary sources were crossed referenced to provide the most accurate picture. This said, it should be recognized that all statistics are prone to error. Though sparsely mentioned, the scope of this study did not allow an in-depth assessment of natural gas and transportation energy subsectors. Nor did this study go into depth on the functioning of financial mechanisms mentioned that facilitate RE deployment. To examine how the impact of EU membership on energy investments, three experts in the field were contacted for semi-structured interviews. They are listed in table 3, along with their occupation and relevant expertise. The interviews were either conducted through skype or with written questions answered by email. A sample of the questions can be found in annex.

Table 3 Interviewees

Interviewees	**Profile**	**Expertise relevant to thesis**
Marina Olshanskaya	Co-Founder and CEO of AvantGarde Energy	Energy investments in Balkans
Maja Matejic	Portfolio Manager – Energy United Nations Development Program	Energy in Serbia
Brendan Duprey	Policy Expert	Renewable Energy in Romania

4 Results

4.1 Serbia

4.1.1 Socio-Economic Context

The time-scale of energy developments and associated investments is for the most part measured in terms of decades due to the magnitude of energy infrastructure and legal requirements involved. Consequentially, mentioning Serbia's historical energy developments since the 1980's is necessary to better grasp the root of today's context and its implications for future investments. Preceding its current statehood, Serbia, along with the socialist republics of Bosnia, Croatia, Macedonia, Montenegro, and Slovenia, formed the Socialist Federal Republic of Yugoslavia. Each republic disposed of unique geological and physical resources that influenced their historical energy developments and are still reflected in each of these nations' contemporary energy mixes. The oil crisis of the 1970s forced the government of Yugoslavia to reconsider its energy policies and minimize its dependence on foreign oil coming primarily from the Soviet Union, Syria, and Iraq. Taken its abundance across Serbia, coal emerged as the key alternative to fuel the Republic's numerous thermal power plants. Shortly after, coal dominated the Serbia's energy production mix despite its important hydropower potential. The jointly operated Iron Gate dams on the Danube between Serbia and Romania were completed in the 1970s and subsequently extended in the 1980s. By then, they were among the largest hydro power stations in the world. Despite the significant foreign investments in natural gas and oil prospecting in and on the coast of Croatia and Montenegro, their shares remained minimal in the Federation's overall energy mix. Nuclear energy development faced due resistance taken the then recent Chernobyl accident and lack of domestic technology. This said, Slovenia hosted the Federation's first nuclear facility which contributed up to 5% of the country's energy mix (Curtis, 1992). The wars of the 1990s that resulted in the break-up of the former Yugoslavia fragmented the region's energy grids and exposed their vulnerability to national and international interests as well as competing priorities (i.e. energy independence, diversification of sources, or security). Nonetheless, bordered by eight countries, Serbia today plays a pivotal role in electricity transiting and bilateral trading in the region.

Within the Serbian energy sector, the major actors that come into play are the publicly-owned electricity generation incumbent, Elektroprivreda Srbije (EPS), the transmission system operator, Elektromreža Srbije, and the incumbent in the transportation, distribution, storage, and trade of natural gas, Srbijagas. Despite the plaguing mismanagement and significant financial deficits in the sector, further expansion of the national gas grid remains in the country's agenda. This is best exemplified by the construction of a 48 million cross-country pipeline set to begin in 2018 (Ralev, 2017d; Popović, 2017). Taken the scope of this thesis, some focus will be put on the recent developments of the national power utility – EPS. Along with an aging existing infrastructure, the management of these state-owned companies has proven ineffective in coping with evolving needs (Popović, 2017). In an effort to address these gaps, the government of Serbia adopted a plan in 2014 to restructure and reorganize EPS. This included EPS becoming a joint-stock company where the state is the majority shareholder, and the reorganization into three large groups: production (including trading), supply and distribution. The government expects this move to reduce expenses by 36 million euros annually and increase efficiency and transparency. The change included the merging of seven subsidiary companies involved in the production of electricity and coal with EPS. Moreover, the management, comprised of 650 directors, would be reduced by 30-60%. The government has suggested that its private partner should be a global leader in the energy

sector, and that it would be in charge of the appointment of the new management of EPS. Since the restructuring, the EPS has significantly reduced its amount of debt and enforced strict debt controlling mechanisms, with households being disconnected from the grid if unpaid bills reach 40 euros. The EBRD provided the financial backing that enabled the restructuring on the basis that it contributed to the general reforms of the Serbian energy sector in line with the liberalization and regional integration objectives of EU accession. Despite having completely liberalized the electricity market since 2015, EPS still holds the largest share in the private sector, and 100% of share across households. The largest private supplier in Serbian electricity market is the Slovenian GEN-I with 12 customers and 3 % of electricity market. In addition to the first three actors, a few governmental actors are relevant to mention. The Ministry of Mining and Energy has significant influence on the development of the energy sector in Serbia. Additionally, the Agency for Energy Efficiency, which was formed in 2002 with the support of the EU, is responsible to monitor the implementation of energy efficiency project. Lastly, the Energy Agency (AERS) is responsible for some legislative aspects including the issuing of licenses, but more importantly is responsible for determining all prices, methodologies and tariffs for electricity generation, transmission and distribution (Balkan Energy, 2017).

Despite a controversial contemporary energy profile, which will be expanded on later in this chapter, Serbia remains the largest player in terms of production capacity in the western Balkans (Pešut, n.d.). With a population of about 7 million and in spite of an important industrial sector, Serbia has transitioned to a service-based upper middle-income economy. The government of the Republic of Serbia ratified the Paris Agreement in 2017 and intends to reduce GHG emissions by 9.8% by 2030 compared to 1990 levels. This has attracted controversies due to the fact that the collapse of its industrial sector has already decreased GHG emissions by 25% since the 1990s – thus allowing a defacto 15% increase by 2030 (Neslen, 2015). In relevance to this thesis and further discussed in the section on legal and policy frameworks, Serbia has adopted national renewable energy targets of 27% by 2020, which notably aim to outperform the EU common 20% target (MacDowall, 2013).

With the liberalization of its economy, Serbia's energy sector among others, is increasing linked with foreign actors. The Balkan country benefits from multiple free trade agreements including with Russia, Kazakhstan, Turkey and the EU (Guide for investing in Serbia, 2017). It's notable involvement with the Eurasian Economic Commission, and the Energy Community (EnC) exemplifies two pillars of its "Four Pillar Diplomacy" strategy (Xinhua, 2017). Though Serbia has often been called out on relations with various opposing geopolitical sides, it is worth mentioning that this has been central to Serbia's international position as Belgrade hosted the first non-alignment conference in 1961 (Rudic, 2017). A shared cultural heritage, as well as an ever increasing Serbian dependency on Russian gas has led to a deepening of political and economic ties between the two nations, particularly in the area of energy (Xinhua, 2017). Through China's Belt and Road initiative, China is increasingly becoming a key player in the Balkans through the funding of large infrastructure projects. This said, Serbia's energy sector is mostly influenced through the country's involvement with the Energy Community (EC). Under its framework, it is developing with its neighbors and the EU an integrated system as a means to pave the way towards EU integration (Brnabic & Turkovic, 2015). The role and significance of the EnC will be further examined later in the chapter.

When looking at the overall picture, Serbia's investment flows are dominated by European funding. EU countries are the main importers of FDI's given that 80% of FDIs come from the EU (Guide for investing in Serbia, 2017). Golusin (2010) characterized investments in energy production by RES as very modest and almost completely reliant on foreign capital.

Since 2014, Serbia has jumped from the 93rd position to the 43rd in the World Bank's 2018 Ease of Doing Business ranking (World Bank Group, 2017). EU funds, bodies and banks are the most important providers of financial support for RES projects (Golusin, Tesic, & Ostojic, 2010). Having previously mentioned the national stakeholders, several key institutions and funding instruments play a central role in Serbia's investment context. The European Investment Fund (EIF), the European Investment Bank (EIB), and the EU's structural funds provide loans and guarantees through commercial banks as intermediaries (e.g. Banca Intesa a.d. Beograd, Erste Bank a.d. Novi Sad).Through the European Bank for Reconstruction and Development (EBRD), the Western Balkans Sustainable Energy Direct Financing Facility provides a structure from which local small and medium enterprises, and energy developers can apply for direct loans for RES projects. Moreover, the Green Growth Fund also provides direct and indirect (through financial intermediaries) financing for small scale renewable energy projects up to €50 million. The International Finance Corporation (IFC) further provides equity, loans, and other financial instruments to support infrastructure investments in the energy sector. The international funding mechanisms have attracted a number of foreign players in the sector. Several European countries are investing in wind energy with the prospect of feed-in tariffs that would result in net benefits. Some of these companies are the Serbian-Italian company MK Fintel Wind, and the Belgian company Elicio, with some notable non-European companies including the Israeli company Enlight Renewable Energies, and Tesla Wind which operates under a company based in Abu Dhabi (Bjelotomic, 2017b). Some isolated investments in energy efficiency, solar and wind have been made by the Serbian, Israeli, and Swiss governments, as well as the IFC as a means to achieve Serbia's renewable energy targets and commitments (Brkic, 2017; Radomir Ralev, 2017d, 2017b). Through its new Energy Sector Development Strategy, the Serbian government points to the important role of joint ventures with foreign partners to meet its significant investment needs in the electricity sector.

In addition to European-sourced investments, a number of other players have attracted attention. Partially available 2015 FDI flow data show significant Chinese investment inflows into Serbia, as compared to negative investment flows in Bulgaria (Hunya & Schwarzhappel, 2016). Serbia is the largest recipient of Chinese funds in the Balkans (Wilson, 2017). Through its $900 billion Belt and Road Initiative, China has set eyes on southeast Europe with Serbia at its core (Phillips, 2017). It has already signed close to €5.5 billion worth of engineering contracts with Serbia (Makocki, 2017). China is involved in the construction of large infrastructure projects, from railway tracks to energy infrastructure. China's Shanghai Electric Group signed a deal to build a 200 megawatt gas-fired cogeneration plant that will supply the Pancevo oil refinery, run by NIS ("Chinese group signs deal to build 200 MW cogeneration plant in Serbia," 2017). This case is interesting as it combines a Chinese construction of 180 million euros, and Russian ownership. It is a joint venture between NIS, majority owned by Russia's Gazprom Neft, and Gazprom Energy holding, a subsidiary of Gazprom, in which the two firms will hold 49 and 51 percent stake respectively ("Shanghai Electric Group - Energy Business Review," 2017). Another Chinese purchase involved the acquiring of Serbia's only steel mill in exchange of 46 million euros (Surk, 2017). In the process, ExIm Bank and the China Development Bank have emerged as the most actively financing banks of China ("Serbia, SEE: New coal TPPs, Chinese financing," 2015). In addition to figures provided, memorandum of understandings between the two nations will give place to more infrastructure work by the China Road and Bridge Corporation (CRBC) with a combined value of 2.5 billion euro (Radomir Ralev, 2017a). Certain municipalities have searched to use this Chinese interest into advancing the development of renewables as witnessed by the ongoing negotiations between Chinese investors and the municipality of Nova Crnja to build a wind park ("Serbia Chinese company to build wind park," 2017). China has furthermore demonstrated interest as financiers in long-lost projects such as the Danube-Morava-Vardar

waterway project if Serbia, Macedonia and Greece reached an agreement ("Chinese Money to enable Europe's Own 'Silk Road,'" 2017). On the other hand, figures up to 3.5 billion euro have been cited as representing Russia's cumulative investment in Serbia in the past decade with close to 90% of all investments being made in the energy sector (Bjelotomic, 2017a; Vršnak, 2017). Russia's two biggest operating companies in Serbia are Gazprom Neft and Lukoil with over a billion euro of planned investments.

4.1.2 Policy/Legal Frameworks

Tešić (2011) gives a thorough background on the evolution of Serbia's legislative efforts in terms of renewable energy sources (RES). Up until the signing of the Kyoto protocol in 2007, the results of the economic downfall of the 1990s translated into little to no international pressure on the Serbian government to consider limiting its greenhouse gas (GHG) emissions. The EU's rapprochement with the countries of Southeast Europe concretized in 2006 under the Treaty of the Energy Community, which played and continues to be major catalysing role for change in the region. The shift began by the call to adopt, among others, the EU's 2001/77/EC regulation on promoting electricity production from RES. The years between 2004 and 2009 saw the Serbian government participate in the creation of the International Renewable Energy Agency (IREA), as well as adopt key strategic and legislative documents. Serbia's Energy Law of 2004 is credited to have legalised the formation of new enterprises in the energy sector; thus, enabling investments in RES power plants as well as ending the monopoly of the Serbian Electric Power Industry. Tešić (2011) points out to the economic, employment and environmental incentives of developing and prioritizing the use of RES stressed in the National Strategy for Economic Development of Serbia 2006-2012, the National Sustainable Development, and the National Environmental Protection program. Serbia recognizes its own RES potential and its responsibility to make use of it in its Energy Sector Development Strategy of the Republic of Serbia by 2015. The strategy, being strengthened by the passing of specific measures, searched to create a favourable investment environment for renewables. More specifically, the Program for the Realization of the Energy Sector Development Strategy and its subsequent amendments not only aimed at establishing the regulatory framework for higher renewables usage but searched to develop the financial bodies (National Energy Efficiency Fund) and initiatives that would stimulate greater investments in the renewable energy sector. This said, it is another measure passed in 2009, the Decree on Measures of Incentives for the Production of Electricity Using Renewable Energy Sources, that defined the feed-in tariffs for electricity produced by RE power plants. Despite the encouraging quantity of legal frameworks, initiatives and bodies developed in that period of time, Tešić (2011) points to the important implementation-related shortcomings due to the imprecision, inconsistencies, and incompleteness of regulations, particularly related to targets and insufficient decisiveness of measures (Tešić, Kiss, & Zavargo, 2011). The replacement of the EU's former directives by the 2009/28/EC set national binding targets for all EU members with a common target of at least 20% of the total consumption of energy in the EU by 2020 to be from RES. By 2012, Serbia had adopted the directive and set a national target of 27% of gross renewable energy consumption. This total would be reach through the sum of each subsector - electricity, heat and transportation – representing 12,1%, 12,3% and 2,6% respectively (Brnabic & Turkovic, 2015). To harmonize with the EU's Third Energy Package, the Serbian government passed its new Energy Law in 2014. This helped Serbia significantly align its legislation with EU Acquis. The new law has played a major role in securing RES producers the timely access to power purchase agreements and thus facilitating investments in the sector (Ferenczi, 2015). The law regulates feed-in-tariffs, which is considered the main support scheme for the production of electricity from RES in Serbia. Concretely, the plant operators need to obtain the status of a "privileged power producer". After having concluded a power purchase agreement with the plant operator, the guaranteed

supplier Elektroprivreda Srbije is legally obliged to buy the specified amount of electricity at an incentive price. The type of RES technology influences the amount of the feed-in-tariff (Ćetković, 2017). In 2015, the Serbian government passed the Energy Sector Development Strategy of the Republic of Serbia for the period by 2025 with Projections by 2030. The document reiterates Serbia's international commitments to the Energy Community and the European Union as well as to clean and low-impact energy sources. With a predicted upward trend towards electricity consumption in the country, the plan reaffirms Serbia's national RES targets and the use of feed-in-tariffs with 12-years of guaranteed electricity supply. The document puts a heavy emphasis on the link between energy efficiency and renewable energy sources as a means of avoiding the compensation of inefficiencies with more energy production. In terms of its legal obligations, the document reiterates that Serbia's main objective is to harmonize its regulations with those of the EU; notably mentioning possible exceptions when following other internationally assumed obligations. Moreover, the Serbian government has mapped out clear investment needs to shape its future energy sector developments. Targeting the development of its RES capacities, it estimates upwards of EUR 2,3 billion investments until 2020, 520 million until 2025, and 750 million until 2030. These figures can be visualized in table 4 along with other investment need projections. It foresees the involvement of foreign partners in the realization of both large-scale hydro power plants and wind farms (Energy Sector Development Strategy of the Republic of Serbia for the period by 2025 with projections by 2030, 2016). Following a call for greater energy investments by the Energy Minister, the country is expected to welcome a growing number of energy actors, including the French energy giant EDF (Harper, 2017; Randomir Ralev, 2018). In addition to foreign investments, the Serbian Energy Sector Strategy also suggests that price increase for end-users, tax allowances and pollution taxes on emitting energy producers will all come at play in funding future RES projects (Energy Sector Development Strategy of the Republic of Serbia for the period by 2025 with projections by 2030, 2016). Tapping into household electricity prices has for long been controversial with competing statements made across governmental institutions.

Table 4 Investment Needs in Serbian Energy Sector (Serbian Ministry of Mining and Energy)

Year	until 2020	until 2025	until 2030
Modernization of existing thermal power plants according to the LCP Directive	634*	-	-
Modernization of existing hydro power plants	200	100	100
Construction of new conventional thermal power plants	1.100	500	500
Construction of PSHPP	360	300	300
Construction of new RES capacities	2.323	520	750
Investments into transmission system	200	170	-
Investments into distribution system	500	250	250
Cumulative investment (million Euros)	5.317	7.157	9.057

* Modernization shall be performed in accordance with the deadline for Directive implementation

The 2017 Annual Implementation report by the EnC Secretariat commanded both the latest Energy Law and the adopted secondary legislation. This said, the EnC secretariat's latest report which assess the progress made in the sector liberalization, criticized the authorities lack of implementation (Energy Community, 2017). Specifically, the Energy Community Secretariat's WB6 Sustainability Charter Monitoring Report 3/2018 mentions that when it comes to establishing national indicative roadmaps for implementing measures required to increase investor confidence in sustainable energy markets, Serbia has missed all the deadlines

under this chapter and refuses to cooperate. This is due to the complete disregard for transparency matters from Serbian authorities reflected by the absence of an established line of communication on the matter. Furthermore, the chapter on strengthening the capacity of national administrative authorities to oversee and govern the national and regional sustainable energy markets in an independent, proactive and transparent manner shares similar significant deficits. As a consequence, foreign investors in Serbia are left unaccompanied, with potential disastrous impacts on market access, and significantly slowing growth in the sector (*WB6 Sustainability Charter Monitoring Report*, 2018).

4.1.3 Energy Profile

In the 1980's and early 1990's Serbia was an important electricity exporter. Due to insufficient investments in new generation capacities, Serbia became an energy importing country on an annual basis since 1996. This however has been subject to seasonal variations as cold winters result in an increase in household consumption. As mentioned previously, Serbia's energy production is dominated by coal. It has Europe's largest proven deposits of lignite coal, reaching up to 21 billion tons ("World Energy Council," 2017). Figure 4 shows Serbia's energy infrastructure and resource deposits. Gross electricity production reached around 38,800 GWh in 2017. As visualized in figure 3, Serbia is over 70% dependent on coal-fueled thermal power plants for its electricity production; leaving around 24% from hydropower and less than 1% from renewables (Popović, 2017; "The energy sector in Serbia," 2013). The deplorable state of coal mines coupled with the important flooding events in 2017 resulted in decrease by 9.8% of the production of coal requiring a significant import of electricity into the national grid (Popović, 2017). By 2015, its renewable energy capacity (excluding large-hydro), was approximately 59MW. This represented less than 1% of the overall installed production capacity; very far from its national target. By then, 60% of those 59MW came from small hydro power plants, 5.34 MW from solar PV on ground, 2.61 MW from solar PV on buildings, 4.86 MW from biogas plants, 10.33 MW from cogeneration plants and only 500kW from wind power (Brnabic & Turkovic, 2015). Today, despite the 18 MW of wind power installed, this amount remains minimal compared to wind power potential (Pineda et al., 2018). Since the 2000s, households hold over 50% of shares in electricity consumption, in part due to the lack of large industry consumers and a high usage of electricity for heating

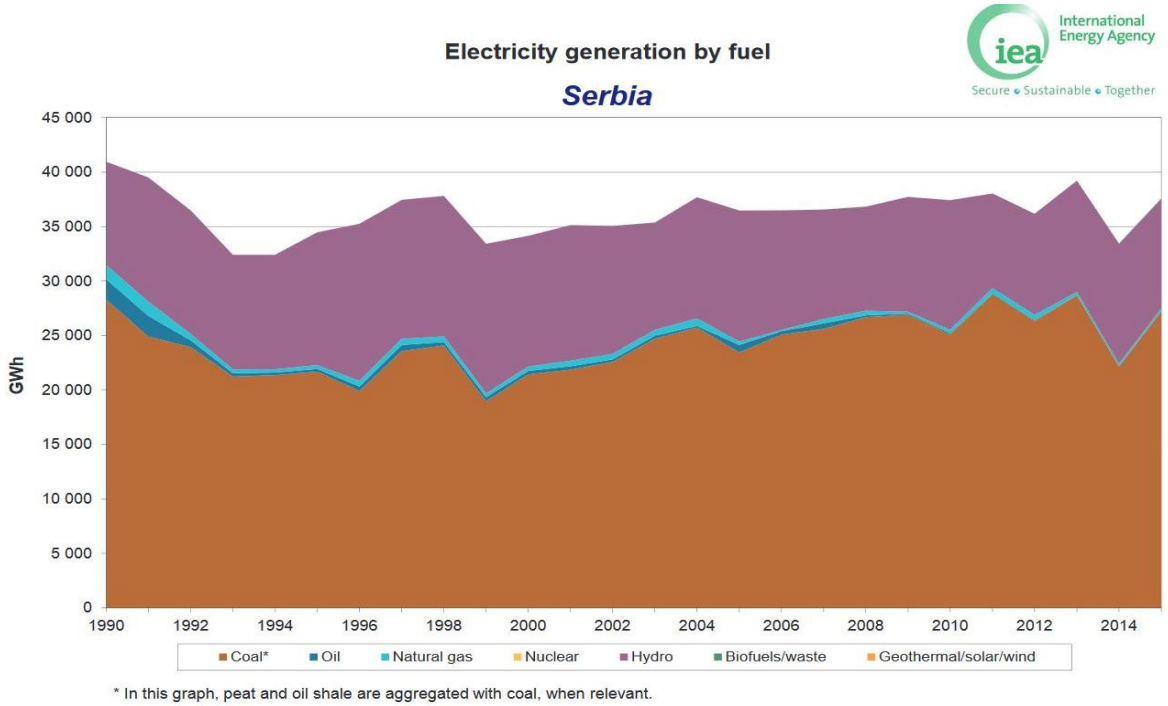

Figure 2 Electricity generation by fuel (International Energy Agency)

purposes. These figures vary according to the sources of information. Nonetheless, estimations suggest that over two thirds of the population rely fully or occasionally on electricity for heating. This dependency on electricity for basic amenities, as well as low generation costs contribute to an artificially-kept low electricity price. Nonetheless, debts that are held by households, with the majority of them dating from prior the structural changes incurred with EPS, account for around 120 million euros while public utilities and the private sector account for 156 million. Predictions estimate that energy consumption in Serbia will increase by 1% every year, consuming approximately 7 TWh of electricity more in the next decade (Balkan Energy, 2017).

Driven by the country's reindustrialization plans, this increasing need is intended to be filled by the application of measures and procedures for energy efficiency and stable energy production (Energy Sector Development Strategy of the Republic of Serbia for the period by 2025 with projections by 2030, 2016). Energy consumption as a value of GDP in Serbia is comparable to its neighbors. This said, it is significantly above EU averages despite energy consumption per capita being lower than EU averages. Taken the low level of energy efficiency in the country, it is estimated that Serbia could save 30 to 40 % of energy through the adoption and enforcement of energy efficiency measures. Annual losses in the distribution network represent close to 15 % of overall electricity delivered. Accounting for around 6.5%, overall loss due to electricity theft, principally in the south, represents between 60 and 80 million euros lost per year. On the other hand, technical losses represent the remainder 8.5 % of annual losses (Balkan Energy, 2017). These figures are comparable to its neighbors. Despite the ongoing coal dependency, the country has been attributed high potential for renewable energies, ranging from wind, to small-scale hydro, biomass, solar and geothermal ("The energy sector in Serbia," 2013). Some estimate that renewables could cover almost half of Serbia's primary energy needs. Utilization of these potentials is currently 18% of gross energy production, but it is almost entirely based on production of electricity in large HPPs (Golusin et al., 2010). According to the Serbian Chamber of Commerce, Serbia currently uses 35% of the total available technical potential of RES (Serbian Chamber of Commerce, 2016).

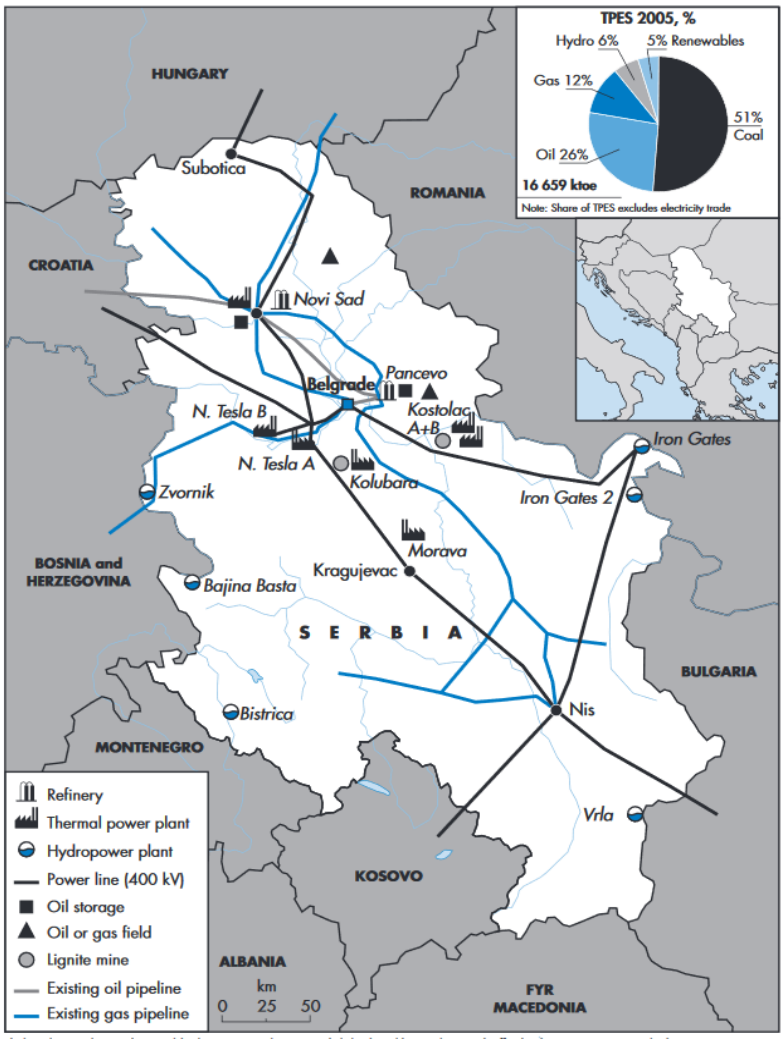

Figure 3 Energy Map of Serbia (Murrey & Gould, 2008)

Among the different renewable energy sources available, biomass represents Serbia's largest share of RES potential, with estimate ranging between 50% and 60% of total share. While the 1980's saw 9 biogas facilities built on animal farms across the country, none are currently operational nor are any under construction under the feed-in scheme. The country's high biomass potential is due to over 55% of its territory being arable land, and over 25% under forests. Furthermore, the additional potential is viable through animal waste. Biomass energy is highly valued as an investment opportunity taken the low initial costs. Large hydropower power plants play an important role in the Serbian context. This said, large untapped potential lays in medium and smaller hydro power plants. The total technical hydropower potential in Serbia is about 17,000 GWh, out of which about 60% is currently utilized. Catchments on the Drina and Morova rivers represent the largest shares of unused potential. According to EPS, upwards of 52 large powerplants with a capacity of 25MW could be taken advantage of. Smaller facilities of up to 10MW further represent 10.4% of the total RES potential in Serbia. While geothermal energy potential is wide-spread across Serbia due to the country's geological characteristics, individual properties, from temperature to chemical composition, are the determining elements that define whether a source is exploited. So far, very few sources, which correspond to 10% of its 800MW potential, have been exploited - mostly for thermal baths and isolated applications (Golusin et al., 2010; Milivojevic & Martinovic, 2003). Previous estimates suggest geothermal energy could contribute to significant dent in heat energy imports (Karakosta, Flouri, Dimopoulou, & Psarras, 2012). Serbia has large potential when it comes to production of energy from wind, corresponding to around 2300 GWh annual electricity generation from wind power. According to previous feasibility studies, 1 316 MW can be installed on locations with more than 5 m/s wind speed at height of 10 meters above ground. This said, only 18 MW have been installed so far (Pineda et al., 2018). Most actors involved in the measurements, construction and funding activities related to wind energy are foreign companies. Despite being almost negligible in today's energy production share, Serbia's high number of sunny days (over 2000h a year) suggests that solar energy could represent close to 16% of shares of potential RES in Serbia. This said, high upfront costs for equipment requires the setting up of fiscal incentives to encourage deployment (Golusin et al., 2010). While variations can be observed across the various sources of data that constitute these results, these variations demonstrate the difficulty to accurately assess current and future energy production capacities. Nonetheless, they provide an overview which demonstrate the important potential of RES in Serbia. Within its Energy Sector Strategy for 2025, the Serbian government explicitly links RES development

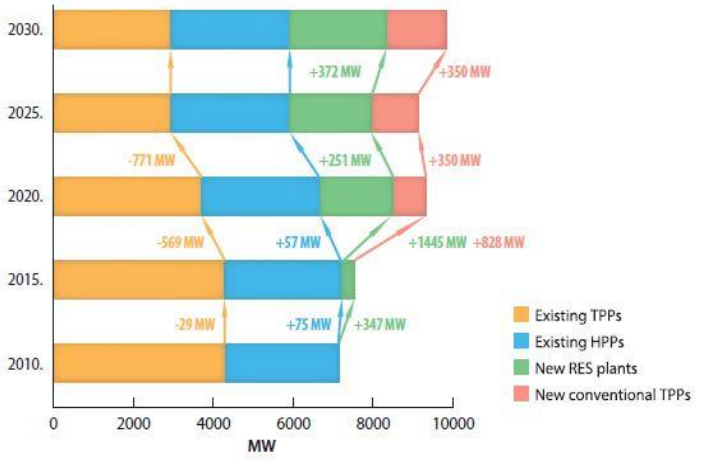

Figure 4 Electricity production projections (Serbian Ministry of Mining and Energy)

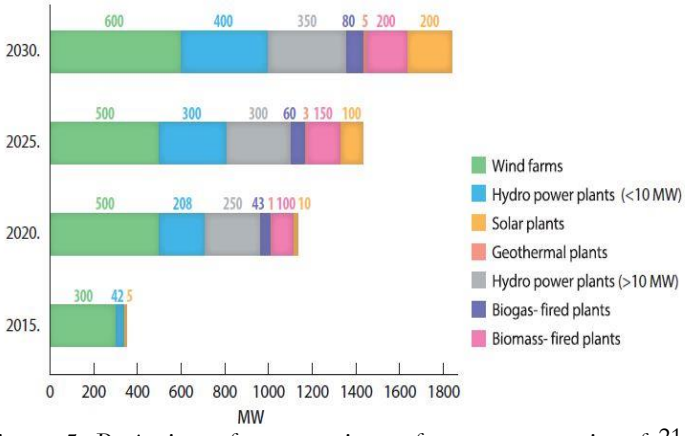

Figure 5 Projection of constructions of power generation form renewable energy sources (Serbian Ministry of Mining and Energy)

to the development of its transmission and distribution network as necessity to integrate the variability of renewables. Furthermore, it stresses the need for stability to justify the construction of new conventional electric power capacities (including coal and large HPPs) (Energy Sector Development Strategy of the Republic of Serbia for the period by 2025 with projections by 2030, 2016). The Serbian government's energy strategy predicts that the installed capacity of photovoltaics will increase to 10 MW by 2020, to 100 MW by 2025 and to 200 MW by 2030. At the same time, however, it is planned to build a new lignite unit with a capacity of up to 700 MW by 2025 (Tzanetakou, 2018). Two figures help visualize the mentioned results. The Serbian government intends to maintain its foundation of conventional powerplants. This can be interpreted from figure 3 that depicts the governments intended additions to the country's energy production capacities. Figure 3 helps contextualize figure 4 which shows the intended developments of the subsectors of renewable energy. A detailed view on Serbia's energy production is available in the Appendix.

4.2 Bulgaria

4.2.1 Socio-Economic Context

This section will cover the major socio-economic elements that characterize the historical and contemporary developments of Bulgaria's energy sector. From 1945 and up until 1989's, Bulgaria had a centrally-planned economy. The heavy industrial characteristic of the time remains apparent through the country's high energy-intensity. The country's close ties to the Soviet Union led to the construction of the Kozloduty nuclear power plant in the 1970s. Having revived the plans of second nuclear power plant in the early 2000s, nuclear energy remains a fundamental component of Bulgaria's energy profile. Transitioning to a market economy, the country joined both the North Atlantic Treaty Organization (NATO) and the European Union in 2004 and 2007 respectively. This economic transition in turn has led to a decrease of power production from thermal power stations (and an increase of the shares of hydropower and nuclear power), structural changes in the industrial sector, introduction of energy efficiency measures in the residential sector and a shift form solid and liquid fuels to natural gas in energy consumption (Ministry of Environment and Water of Bulgaria, 2015). As a member of the EU, and in accordance with its climate and energy Package, Bulgaria has committed to increase its share of RES to 16% by 2020. In Bulgaria, the liberalized electricity market is not full-functioning and the country still has a path to walk to achieve the desired levels of liberalization (World Bank, 2016). According to Stefanov (2011), the country's energy sector is characterized by natural monopolies, and fragmented management of state-owned assets. To compensate for vertical integration that existed in the past, the government created additional management layers that result in overlapping responsibilities and conflicts of interests. This is exemplified by the creation of the Bulgarian Energy Holding (BEH) in 2008 while the Ministry of Energy remains largely involved in the daily operational management of the companies (Stefanov, 2011). While a comprehensive diagram visualizing the stakeholders can be found in the appendix, some of the key stakeholders in the energy sector, specifically related to the electricity sector are the Ministry of Energy, the State Energy and Water Regulatory Commission, the National Electric Company (NEK), the Electric System Operator (ESO EAD), and the Invest Bulgaria Agency (IBA). Accordingly, these bodies shape Bulgaria's energy policies, determines the feed-in tariffs, and grant associated licenses. Together, the NEK, ESO EAD and six other subsidiaries of the BEH are responsible for producing electricity and operating the national grid. Subsidiaries of the BEH hold a dominant position in the Bulgarian electricity market with about 60 of gross domestic generation(World Bank, 2016). The IBA serves as key agency in attracting investment in the country (UNDP, 2014).

The country's low cost of electricity plays an important role in public opinion. Moreover, Stefanov (2011) claims that the implementation of large-scale energy infrastructure projects is hindered by the lack of a sound energy strategy, conflicts of interest at the highest political level, corruption, poor management of state enterprises, monopolistic abuses and politically motivated privatization of assets (Stefanov, 2011). This is further amplified in Brendan (2014) in which corruption and conflict of interests is stressed as a key detrimental factor in Bulgaria's energy sector (Duprey, 2014). In addition to benefiting from the EU market, Bulgaria has free trade agreements with China, Turkey, Macedonia, Israel, Albania, Serbia, Montenegro and, Bosnia and Herzegovina. Nonetheless, a comparable close relationship with Russia can be observed taken Bulgaria's energy dependence. Bulgaria went from the 58th in 2014 to the 50th rank in the World Bank's Ease of Doing Business index (World Bank Group, 2017).

4.2.2 Policy/Legal Framework

In terms of its policy/legal frameworks, 2002 saw the country establish its Energy Strategy which reflected the reforms necessary to join the EU. Developed by the Council of Ministers (CM) and adopted by the National Assembly, the Energy Strategy brought about the country's core energy law. In 2005, the government passed the national long-term program to promote the use of RES (2005-2015), which identified the measures for RES deployment and set its national targets. The 2007 Alternative Energy Sources and Bio-fuels Act in turn established feed-in tariffs for renewable electricity. Another key piece of legislation was the Investment Encouragement Act which had for purpose to promote long-term investments through speeded-up administrative procedures and financial support (Duprey, 2014). Officially joining the EU in 2007, Bulgaria had to adopt all the regulations and obligations concerning energy. The country developed its National Renewable Energy Action Plan (NREAP) in view of achieving its 16% share of RES in the final energy consumption, as required by Directive 2009/28/EC. This plan included progress reports every two years. Kotseva-tikova (2016) provides a thorough background on the recent legislative developments in Bulgaria as well as sheds light on two distinct periods of renewable energy policy development. The first period between 2007 and 2012 was characterized by an abundance of grants, high feed-in tariffs, and an obligation for the operator to connect renewable energy –sourced projects to the grid. This right to prioritized grid connection was abolished by the Energy from Renewable Sources Act in May 2011. The second period was characterized as more restrictive due to the large increase in capacity added. Having achieved the national renewable aim, feed-in tariffs, and the long-term contracts were limited to small installations. In 2015 a new Ministry of Energy was established (Kotseva-tikova, 2016). Legislation introduced in 2015 and 2016 allows the Bulgarian Energy and Water Regulatory Committee to regulate RES and cogeneration mandatory purchasing. This contributes to the government's plan to stabilize the electricity sector. Moreover, by amending regulations and electricity market rules, businesses and households will have an easier time switching between suppliers. Beyond the scope of this study, increasing coordination and cooperation regarding the gas market is also reflected in the government's plans. The government has started to develop a long-term national energy strategy until 2030, with projections for 2050, in line with the 2030 climate and energy EU framework. Nonetheless, taken the new EU coal legislation, Bulgaria intends to ask for exemptions regarding its coal-power thermal power plants. The government argues that such imposed targets are not viable economically nor socially for the Bulgarian economy (Derelieva, 2018).

4.2.3 Energy Profile

In view of providing a comprehensive overview of Bulgaria's energy profile in contrast to the Serbian one, it is necessary to mention Bulgaria's geographical distinctions. Bulgaria occupies a territory of 110,00km² in the Eastern portion of the Balkan peninsula. It is crossed by two mountain ranges and benefits from a 354km coastline on the Black Sea. While the Danube serves as a natural border with Romania, Bulgaria is border by Greece, Macedonia, Serbia, and Turkey. Due to its geographic location, the country has and continues to serve as a key transit route for Russian oil and gas to the region and beyond, as well as a major exporter of electricity to Balkan states. Despite being heavily dependent on energy imports, Bulgaria has significantly reduced imports through the combined effect of renewables deployment, domestic lignite-coal extraction, and nuclear development. This said, nuclear fuels and uranium are entirely imported from the Russian Federation (European Commission, 2017). Bulgaria remains the most carbon intensive of all EU member states, and electricity losses amount to 8% of production.

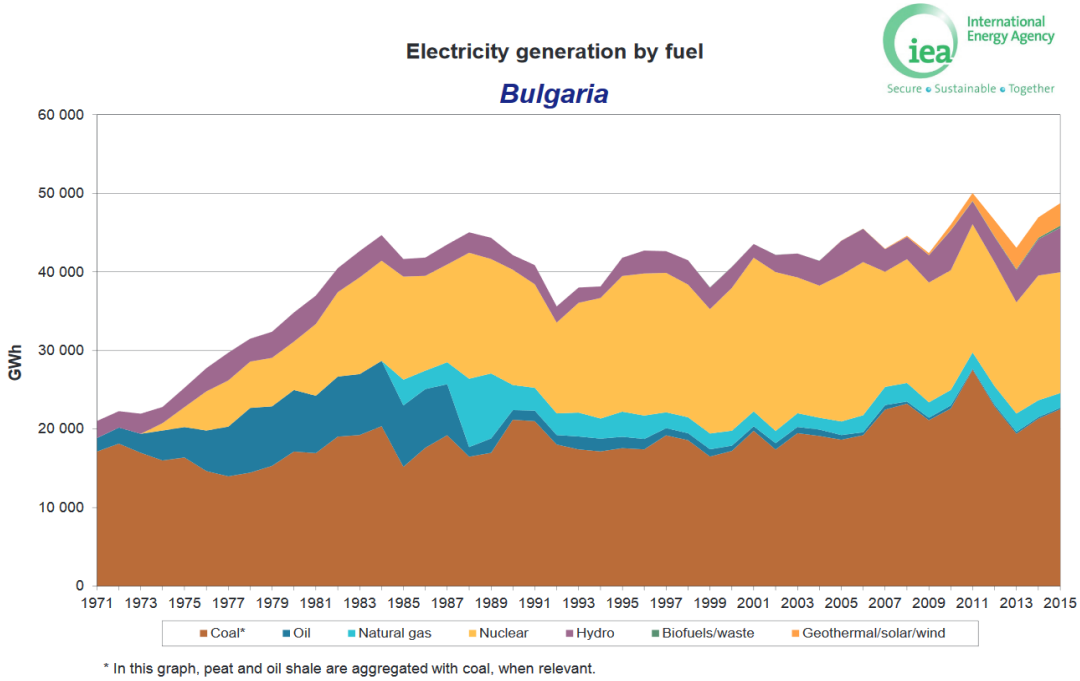

Figure 6 Electricity Generation in Bulgaria (International Energy Agency)

In 2016, households' electricity prices in Bulgaria were more than twice below the EU average level, when measured kWh, and this despite the gradual price increase experienced in the country. On the other hand, the electricity prices per kWh for industries have been falling since 2013. When it comes to Bulgaria's energy consumption structure per sector, it resembles that of EU averages with industry, households, agricultures, transport and services taking the largest shares (European Commission, 2017). The limited progress in energy market liberalization is exemplified by the imposing of fines on two of the three integrated electricity companies in Bulgaria for abuses of dominance by the Bulgarian Commission for Protection of Competition (Mateina, 2018). Gross electric production reached 45,000GWh in 2016, with nuclear, thermal and renewables representing 35%, 48% and 17% of the shares respectively (Derelieva, 2018). As visualized in figure 6, its electricity production is dominated by coal-power thermal power plants and nuclear energy. Since 2004, Bulgaria saw its share of renewable energy sources rise from 9.6 to 18% ("SHARES (Renewables) - Eurostat," 2016). There is an estimated potential for up to 200 MW of geothermal power generation, and upwards of 3,400 MW of wind power generation (Pineda et al., 2018). In regard to hydropower, the National Energy Strategy to 2020 sets out key objectives in the privatization, rehabilitation and construction of new small-scale hydropower projects on the Danube (Todorova, 2011).

Table 5 RES share in gross energy Consumption in Bulgaria

2004	2006	2008	2010	2012
9.6%	9.6%	9.8%	13.8	16.3%

Source: National Statistical Institute

Specifically, it is aiming at having installed 200 small hydropower plans before 2020 with a total capacity of 380 MW. Regarding solar, Bulgaria's potential is greatest for low temperature thermal applications, rather than electric power generation. Moreover, biomass could cover about 9% of the end energy consumption in Bulgaria (Energy Sector of Bulgaria, 2016).

4.3 EU Institutions and Funding Mechanisms

This section will cover the major institutional frameworks and financial support mechanisms operated by the EU and relevant to the region's overall energy developments and investments. In terms of funding mechanisms, specific attention will be placed on their accessibility for Bulgarian and Serbian projects. The most influential development in the region was established through the signing of the Energy Community Treaty in 2005. The treaty, ratified by the European Community and Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Montenegro, the Former Yugoslav Republic of Macedonia, Romania, Serbia and UNMIK on behalf of Kosovo established the Energy Community (EnC) as an institution. By signing the Energy Community (EnC) Treaty, Bulgaria, Serbia, and other countries in the region had committed themselves to transposing and implementing relevant parts of the *Acquis Communautaire* (Chapter 15 - Energy, including Acquis on Energy Efficiency) into the national legislation. With the aim of creating a single energy market, the international body searches to extend the EU's internal energy market rules and principles to countries in the region and beyond on the basis of a legally binding framework ("EnC - Home," 2017). The principal decision-making institution of the EnC is the Ministerial Council. It makes the key policy decisions and adopts the EnC rules and procedures. It's Secretariat, as the sole permanent acting institution, supports the day-to-day activities of the Energy Community and monitors the implementation of the Treaty across signatories. The EnC is the institution with the most direct legislative involvement in Serbia's energy sector. The European Commission (EC) plays a critical role in developing the relevant legislation transmitted through the EnC or directly to member states. It's 2020 Energy Strategy calls for greater use of balanced, cost-effective, and predictable feed-in premiums, warning against retroactive changes that negatively impact investors' confidence. It specifically stresses the value of convergence or harmonization between national schemes as the market for renewables is moving from a local to a cross-border supply. This influence can further be extended to other policy areas through its Strategy for Western Balkans and other climate and energy strategies. The European Parliament also plays an indirect role in pushing for stricter RES targets – the latest being an increase from 27% to 35% of RES consumption by 2030 (Huluban, 2018). The EU's financial institutions including the EBRD and EIB play a defining role in providing equity, loans, and loan guarantees for renewable energy projects. The EBRD has alternatively set up a Western Balkan regional investment platform to expand the range of possible investments. Several instruments restricted to EU members, such as the European Fund for Strategic Investments, and European Structural and Investment Funds, grant financial funding (equity capital, senior and junior debts, or grants) or guarantees to energy infrastructure investments. These programs facilitate access to funding, enhance the leverage potential and/or reduce the risk exposure leading to lower capital costs (Van Nuffel, Rademaekers, Yearwood, & Graichen, 2017).

4.4 Interviews

In order to supplement the results issued from reports and the literature, semi-structured interviews were conducted. The results extracted from these interviews, provide some general overview on the type of investments and investors involved in the Balkans, specifically in Bulgaria and Serbia. More specifically, the interview responses contribute to validating the accuracy of the thesis results. The list of questions asked can be found in annex. The results of the interviews can mostly be categorized around the two initial variables, investor type and investment climate. Across the Balkan region, Marina Olshanskaya states that governmental entities, backed by international financial institutions are the main energy investors in conventional energy sectors (including fossil fuels, transmission, and distribution infrastructure). On the other hand, the private sector dominates RES projects at a much smaller scale than the former. This was further confirmed by Maja Matejic which listed EPS's market reach across all subsectors including coal extraction, coal thermal power plants, large and small hydropower plants, solar, wind and biomass boilers. The private sector is in contrast notably present in small hydro, PVs, solar thermal, biogas, and wind. In determining factors that are critical to energy developments, Olshanskaya mentioned the relevance of energy infrastructure and natural resources (including access to pipelines and natural resources such as coal), as well as the socio-economic context of the country. This is further developed by Matejic through mentions of Serbia's weakness of legal systems (property issues, security of contracts) and construction process (conditions, approval, permits), connection to the grid, slow economic growth, and harmful coal subsidies. Such mentions strengthen the relevance of both the results and the analytical framework used in this thesis. Reflected in the mentioned limitations of the thesis, is the difficulty to estimate the number of ongoing projects in these countries. While governmental sources are cited as the best option to collect data on investments, these are often outdated, or inaccessible. Nonetheless Olshanskaya estimate that while conventional energy projects range in the order of 100-200mln Euro, RES projects are closer to between 5-10mln Euro. While Matejic was unable to give any overall estimations, she pointed out to two specific UNDP-led projects worth 6mil USD in Serbia. The first being a project to accelerate the development of a biomass market in Serbia, and the second to support municipal energy management systems to improve energy efficiency. While the EU, through the EnC secretariat, has played a major role in establishing targets and obligations, Olshanskaya confirms that the governments of the western Balkans constitute the most important influencers of the energy sector and energy investments. The Serbian case does not deviate from these findings according to Matejic. Olshanskaya suggests that a clear difference in the nature of energy investments exists between EU and non-EU member states. Furthermore, Olshanskaya states that through structural funds and programs, EU membership brought additional resources (grants and cheap loans) to the energy sectors of new member states. While Olshanskaya suggests that too many factors come into play to make any predictions, Matejic expects much growth in RES investments in Serbia.

5 Discussions

To assess the impact of EU accession on energy investments in Bulgaria and Serbia, several factors were examined. This chapter will assess the results of this study in a comparative format to answer the initial research question and discuss potential implications.

In Bulgaria and Serbia, the EnC and national governments are the main drivers of RES legislation, and the support mechanisms that are put in place through these legislative frameworks, in turn enable greater RES deployment. Bulgaria's entry into the EU concretized its legal obligations. More specifically, it stressed the compulsory aspect of monitoring and achieving its RES targets. Clear political commitments provided long term national ambitions and thus contributed to establishing confidence in the country's energy sector. By providing subsidies, and adopting legislative changes, Bulgaria improved its investment climate which played a major role in increasing the amounts of energy investments in RES. This was particularly effective in terms of installed wind and solar power capacities. Specifically, it enabled the private sector to capitalize on incentives provided through EU funding mechanisms. The results confirm that support schemes are the most important driver for investments in RES. They limit the risk exposure of investors and improve the profitability of projects. In this sense, directive 2009/28/EC which provides the overall EU framework for stimulating RES investments, has proven to be very effective in stimulating the deployment of RES. This further confirms previous studies which suggest that the success of conducting electricity reforms and attracting investors strongly depend on a transparent and effective regulatory framework and appropriate market conditions (Vlahini, 2014). Furthermore, the efficiency of regulatory institution, quality of regulatory framework and overall institutional capacity plays a key role in this success. The Bulgarian results demonstrate a peak in foreign direct investments in the country following EU accession. This can accordingly be attributed to governmental support programs for priority investment areas, political stability and the increasing harmonization of its legislation with EU legislation which resulted in growing foreign ownership in many sectors of the economy (Stankov & Markov, 2015). The results suggest that Serbia's RES potential could cover almost half of its primary energy needs and with minor adjustments in the regulatory system, RES could easily rise to one-third of Serbia's overall primary energy consumption. Unfortunately, the lack of an effective regulatory environment makes it hard to implement existing laws and largely blocks entrepreneurs from implementing their own projects (Karakosta et al., 2012). By complying and committing to EU legislative obligations, Serbia is indicating its intended trajectory. Serbia's political commitment to get its energy sector in line with EU directives is well documented. While the sufficiency of this trajectory in significantly decarbonizing the Serbian economy can be debated, the move towards EU accession suggests an improved investment climate. This said, there is a relative disconnect between the effect of the EU on the legislative context and its effect on investments and deployment in the energy sector. Contrasting with Bulgaria, this may be attributed to the lack of legislative implementation from Serbian authorities. Legislative developments in the EU, in particular the Clean Energy for All Europeans Package, is causing some concern for the future of the RES sector as it may remove priority access to RES, replace FITs with tendering, and omit binding national targets (Sawin et al., 2017). Nonetheless, the European Commission persists in keeping tackling climate change at the top of its agenda by suggesting to dedicate a quarter of its next budget to relevant programs, in addition to earmarking green programs and establishing sustainable guidelines for project financing (Bayer, 2018; Climate Action Programme, 2018).

The results demonstrate that following EU accession, Bulgaria experienced consequential growth in RE investments and deployment. When looking at the Bulgarian results, and specifically the aggregated RES energy growth rates, strong performances are recorded following 2008. Yordanov (2014) claimed that this can be attributed to a distinctive shift from an unclear vision to clear international commitments and accompanying access to financing (Yordanov, 2014). This study further finds that the value of various mechanisms in ensuring the integration of renewable energy in the grid positively contributed to the development of RES projects. Various elements discussed in this chapter can be visualized through figure 7. This graph displays the share of total generated electricity from hydro and renewable energy sources as share of total electricity generation in each country. What can be observed is that up until 2014, Bulgarian and Serbia Hydro power have been synchronized as matter of seasonal variations and the absence of additional built capacity. This changes towards 2014 as Bulgarian generation capacity increases though the growth of small-scale hydro power plants. Most striking though, and this despite the much smaller scale, the data displays a sharp increase in RES electricity generation from RES in Bulgaria following its date of entry in the EU, particularly after 2009. This may be due to a delay between the time RES projects are financed, constructed, and connected to the national grid. While the S-curve of the Bulgarian RES line may suggest a useful reference to the technology diffusion theory of the sociologist Gabrial Tarde in which the spread of social novelties is initially slow, then expands exponentially, and finally slows down and plateaus, the insignificant Serbian share of RES does not provide a useful comparation for growth rate. Once more data is made available, this aspect could represent a valuable addition in future research. On another note, a more subtle element in Serbia's RES curve can be observed towards 2014. The slight increase around that year coincides with a key milestone, the start of accession talks between Serbia and the EU. While Bulgaria only experienced this very slight increase during the period immediately preceding its accession, which is not expected to happen with Serbia for at least another decade according to the most optimistic, the significant drop in technology costs as well as the overall amplification of the role of RES across the international and national agendas may explain this early growth in Serbia.

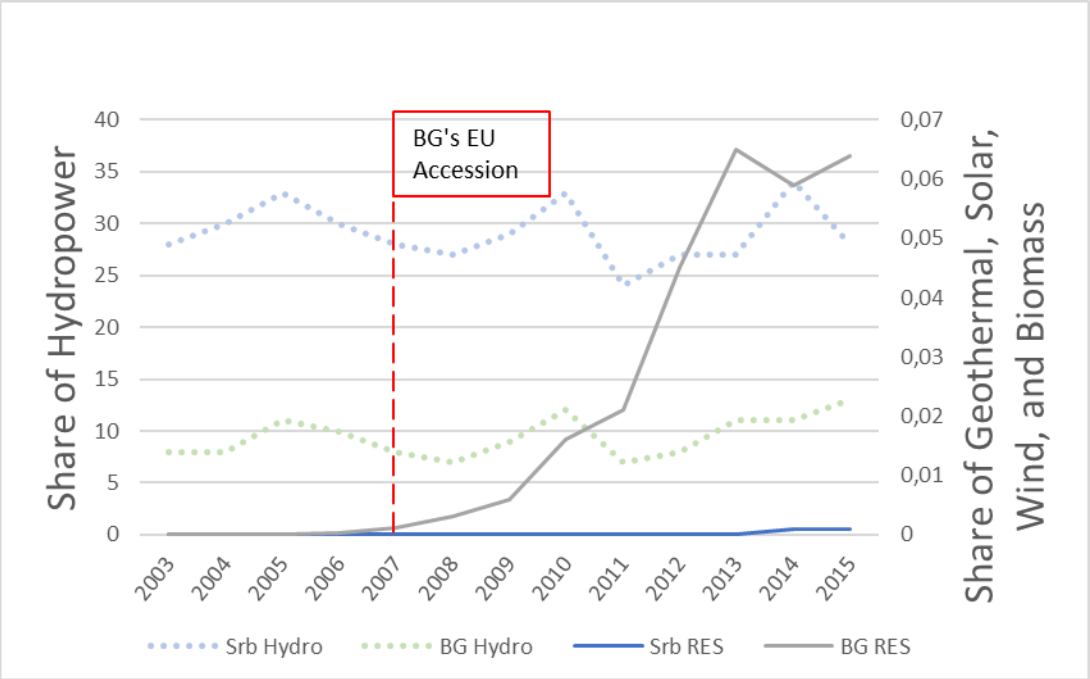

Figure 7 Share of RES Generated (data from the International Energy Agency), calculations by the author.

Taken the pace of legislative change in Serbia, it can be implied that through the energy community treaty obligations and continued adoption of EU legislation, the market may exhibit the elements fostering increased investments. Nonetheless, there is a clear need for increased transparency to provide boost investor confidence. This is particularly true as EU subsidies that are connected to EU membership may not be available in the short-or medium term. This may act as a limiting factor in terms of potential energy investors. While the EU has had an impact on the legislative context and has, in a limited form, provided an enabling environment for RES projects, the level of energy investments has not reflected the growth experienced by Bulgaria post-EU accession. Figure 7 also exemplifies to certain extent the important data limitations when studying renewable energy in the Balkans. This thesis found that only very few opportunities for comparable indicators are accessible and thus argues that there is not enough literature on renewable energy, specifically in the operative context of the Balkan region.

The results demonstrated that Bulgaria and Serbia share socio-economic factors that have and continue to influence the development of the countries' energy sector, including the process of liberalization of these very sectors. Both Bulgaria and Serbia have transitioned from centrally-planned economies to market economies. In the process, they have undertaken the liberalization of their electricity markets. While both markets remain dominated by the national incumbent, Bulgaria is at a later stage where the incumbent's subsidiaries represent 60% of the market as compared to over 90% in Serbia. The fast growth of Bulgaria's RES sector raised issues related to the methodology and the strategy of its management. The implications of such rapid growth have attracted significant criticisms from researchers and environmental activists. Indeed, this study finds that challenges faced in Bulgaria correspond to the main findings found in Martino (2015), in which the cost and efficiencies of subsidies, social tensions, and the lack of lack of long-term vision are all major barriers to the success of Bulgaria's RES development (Martino, 2015). In Serbia, while the legislative context is indicating the direction and intentions of the government to align with the EU prescriptions, several socio-economic elements that influence the energy market and profile are hindering further progress. This can be witnessed through the form of opaque decision-making processes, inconsistencies, and the influence of party-politics on the business climate. These very elements are also visible in the Bulgarian context where corruption, conflicts of interest and poor management has negatively impacted the country's energy sector and led to unsustainable growth in the country's RES deployment. This correlates with the World Bank's findings that suggest that Bulgaria's market structure is concentrated, leaving it open to potential abuse of market power (World Bank, 2016). The legislative package enforced today reveals Bulgaria's weaknesses as it struggles to move beyond what has been accomplished so far in its share of RES production. Simply put, it helped develop the "low hanging" projects, but did not persist in enabling lasting transformative and ambitious projects. Moreover, the lack of a strategic plan to integrate RES development with grid infrastructure led to an electricity bottleneck situation. In Serbia, administrative delays have led to higher project development costs, meaning that fewer equity investors and lenders have been willing to engage in and support projects (Brnabic & Turkovic, 2015). Such poor institutional quality contributes to Serbia's low RES growth rate. **T**he lack of coordination in the adoption and implementation of legislation as stressed in this study may result in the approval and construction of RES production sites at odds with other environmental concerns. This said, the results suggest that as the EU, China and Russia may play different roles in contributing to Serbia's energy investment needs, both China and the EBRD may gain from cooperating to support Serbia's EU ambitions (Makocki, 2017; Murrey & Gould, 2008; Surk, 2017).

Based on the results and discussion, this thesis found that by targeting legislative frameworks, EU membership does influence the investment climate and investor type, and consequentially, impacts energy investments, particularly aimed at RES. Consequentially, this study agrees with Hanni (2011) in which a country's legislation, long term policy commitments, electricity market and the state of its infrastructure are key determinants of FDI in renewable electricity generation (Hanni et al., 2011) . As the largest investor in the region and its overarching energy integration strategies, the EU has significant leverage. The energy targets prone by the EU and its access to innovative technologies provides a solid foundation for the region's RES potential. This is especially relevant taken that current investments in generation capacity and grid infrastructure in Europe are mainly driven by policies, support schemes, and RES market integration projects rather than a factor of demand growth (Van Nuffel et al., 2017). The socio-economic context, from which both Bulgaria and Serbia share elements, may leave the latter at risk of experiencing similar controversial developments. The Bulgarian results suggest that while the EU played an important role in in enabling energy investments, the legislative conditions displayed various limitations. The EU's inability to advance consistently across other legislative fronts may create opportunities for detrimental consequences. Brendan (2014) demonstrated that a silos-oriented approach failed to prevent abuses where governmental authorities had economic interests in certain RES projects at the expenses of environmental concerns. EU membership has had an impact on energy investments in Bulgaria with important controversial subsequent impacts. Serbian adoption of regulation and inconsistent progress on the Acquis suggests that similar negative consequences could arise from hasty focusing on the adoption of RES. While Serbia has demonstrated a plan, the plan does not reflect the necessary level of ambition due to competing energy priorities entrenched in political and private conflict of interests. Here, it is not the lack of plan but rather the openness of the market and reliability of the government that is put in question. It can be added that while the EU may provide the theoretical political framework necessary to secure RE investments, the Serbian context may lead renewable energy developments to feed into the already established monopolies of power.

6 Conclusion

Driven by international climate policy commitments and the increasing risks associated to energy production from fossil fuels, renewable energy investment and deployment is experiencing significant growth across the world. Through various financial support mechanisms that capitalize on both private and institutional funds, the European Union has searched to undergo deep changes in its members' energy sectors and promote the use of renewable energy sources. In this regard, this study aimed at investigating the effect of EU membership and accession on energy sector investments particularly aiming at RES deployment in the Balkans, using Bulgaria and Serbia as case studies. The scope of this study was determined by the pertinence of the results for potential future EU accessions in the Western Balkan region. A literature review allowed the identification of key factors including the socio-economic context, the legislative frameworks, and the energy profile. The analytical framework than highlighted the role of these factors on two variables, investment climate and the investor type, that define energy investments. Following semi-structured interviews, assessing statistical data, and undertaking a literature analysis, the study deconstructed the stated factors and examined the influence of EU membership on these factors. The conducted interviews helped contextualize and bring up-to-date the previously sought findings regarding the differentiated roles of the private and public sectors, as well as the influence of the EU on the legislative frameworks in place in the Balkan region. While helping to define the scope of this thesis, the methodology categorized complex and multidimensional factors that could easily be remodeled. While it placed an important emphasis on the two defining variable of energy investments, the limited access to information regarding investors involved in RES projects limited the depth of the results. By comparatively assessing the results of Bulgaria and Serbia's growth in RES deployment, shared socio-economic characteristics and legislative frameworks, implications were drawn on the EU's influence on energy investments. The findings helped answer the central research question and concludes that EU membership does have an impact on energy investments, particularly through its influence on national legislation and investments. Nevertheless, the extent of this impact is limited due to the influence of other key factors.

6.1 Conclusions

The Bulgarian case study demonstrated the duality in pursuing the deployment of renewables at the expense of other policy objectives. The achievement of the renewable target has not been a sign of successful energy policies in Bulgaria, but rather point to the negative impacts of corruptive practices on the environment and society as a whole (Kotseva-tikova, 2016). While the evidence shows that Serbia is gaining traction in adopting the legislative frameworks conceived by the EU, the persistent and debatable worsening conditions of the rule of law, transparency and governmental accountability raises questions of credibility in following up with both energy targets, environmental considerations, and general EU rapprochement. To be able to attract more investments, Serbia needs to move beyond a focus on stability and provide the necessary transparency to reassure investors. Even if energy efficiency measures are considered, it is highly unlikely that the country can achieve its 2020 targets. Within the interlinkages between energy and society, the failure to shift to renewables may in turn provoke more instability as air pollution, caused by coal-power power plants has spark popular upraise in the region (Ciuta, 2018). Furthermore, retrofitting and energy efficiency is essential to not over deploy as this would cause over-consumption. This entails that the scaling up process should not be at the expense of human rights, local communities and the environment (Young & Yrjö-Koskinen, 2017). Suggested by Vlahini (2014), and reaffirmed through this thesis, Bulgaria and Serbia have displayed a low level of regulatory quality, thus leading to important challenges in unilaterally adopting and implementing EU legislation.

Reaffirming the findings of both Brendan (2016) and Kotseva-tikova (2016), this study concludes that RES policies should not be considered in isolation but in conjunction with other policies.

6.2 Recommendations

In light of the conclusions presented, a few recommendations have been developed. These can be framed as policy-oriented and research oriented.

6.2.1 Policy Recommendations

Stemming from the conclusions, this thesis recommends strengthening the conditionality element within the accession process. Taken the early stage of potential accession for the Republic of Serbia and the Republic of Montenegro, it is an opportune moment to consider ensuring the accession process guarantees social, economic, and environmental viability. By raising the question as to whether the current EU reform model in the energy sector is appropriate enough to be successfully implemented in regions wishing to join the EU, this thesis seeks to stress the need to ensure that the different agencies and institutions of the European Union do not push for legislation or finance projects that are mutually counterproductive. Here, the sequence of adoption and implementation of the Acquis may help in setting up the appropriate conditions to undertake sector reforms.

The second recommendation lends more to general perspective of consumption reduction. It is important to understand the overall cost of producing renewable energy technologies. Here, the question is not to assume the need to replace carbon intensive with renewables but rather extend the aim to reduce overall consumption. Reducing the dependence on electricity production for industrial purposes, diverting away from increased transportation needs, maximizing energy efficiency by retrofitting buildings and promoting short-supply chains are all potential scenarios of consumption reduction. As conveyed through the results, this could take place by starting to minimize electricity price distortions as these may facilitate over-consumption as well as inhibit new investments in energy efficiency across the grid infrastructure.

6.2.2 Research Recommendations

The data limitations faced in this thesis points to the difficulty in accessing comparable and reliable data in the Balkan region. As such, this research would like to echo the need to pursue the development of the Climate Investment Readiness Index (CIRI). As a tool for promoting sustainable investment climates for climate-friendly investments, the index would 1) provide a systematic and objective evaluation of the enabling environment for supporting private sector investment in climate mitigation technologies; and 2) provide country-based assessments of incentives and barriers that describe the preparedness and maturity to move into the arena of climate-friendly investments (World Bank, 2010). In terms of future research, this thesis suggests a need to develop a deeper understanding of the interlinkages between economic reforms and environmental challenges, as well as better integrate these considerations into policy adoption and monitoring.

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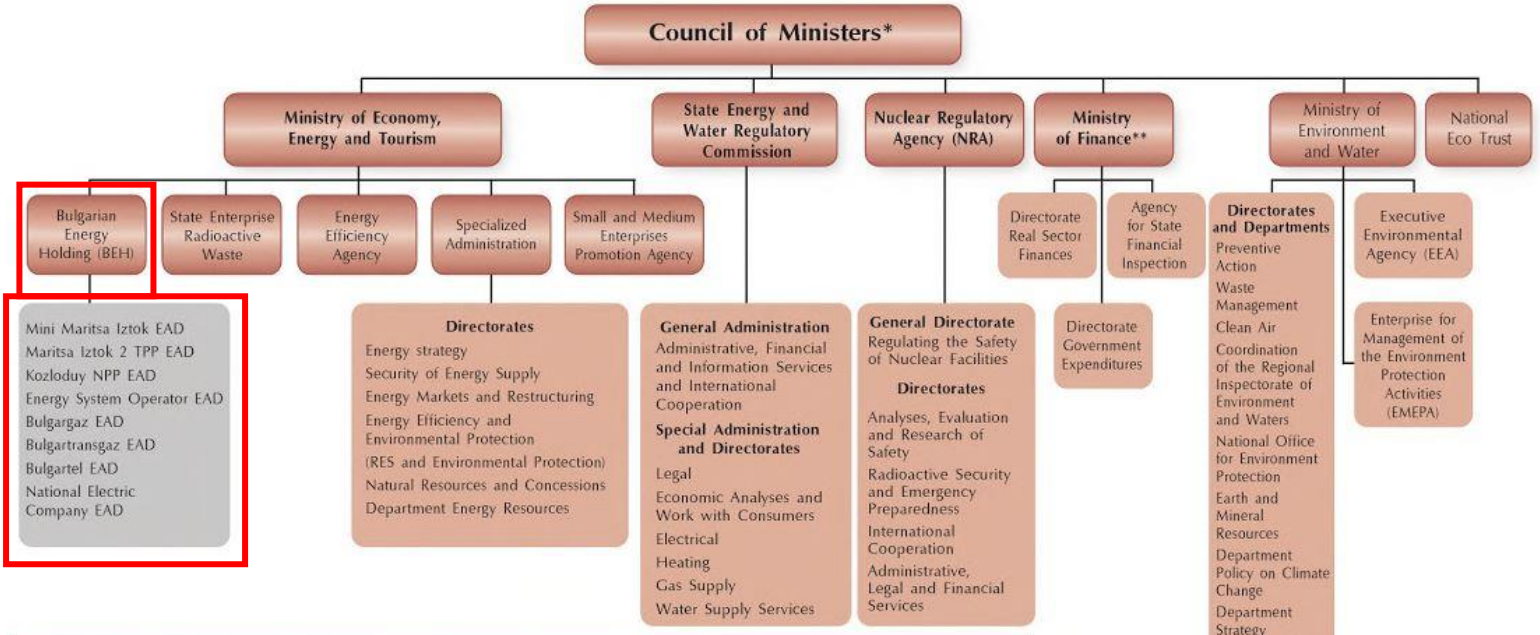
Appendix

Available technical potential of renewable energy sources in the Republic of Serbia

Type of RES	Available technical potential in use (Mtoe)	Unused available technical potential (Mtoe)	Total available technical potential (Mtoe)
BIOMASS	1,054	2,394	3,448
Agricultural biomass	0,033	1,637	1,67
Residues of agricultural crops	0,033	0,99	1,023
Residues in fruit growing, viticulture and fruit processing	-	0,605	0,605
Liquid manure	-	0,042	0,042
Wood (forest) biomass	1,021	0,509	1,53
Energy crops	-	-	not available
Biodegradable waste	0	0,248	0,248
Biodegradable public utilities waste	0	0,205	0,205
Biodegradable waste (excluding public utilities)	0	0,043	0,043
HYDRO ENERGY	0,909	0,770	1,679
For installed capacities up to 10MW	0,004	0,151	0,155
For installed capacities from 10MW to 30MW	0,020	0,102	0,122
For installed capacities up to exceeding 30MW	0,885	0,517	1,402
GEOTHERMAL	≈0	0,1	0,180
For electricity generation	≈0	≈0	≈0
For heat generation	0,005	0,175	0,180
SOLAR ENERGY	≈0	0,240	0,240
For electricity generation	≈0	0,046	0,046
For heat generation	≈0	0,194	0,194
WIND ENERGY	≈0	0,103	0,103
Total from all RES	1,968	3,682	5,65

Source: Strategy for Energy Development of the Republic of Serbia until 2025 with projections to 2030



Industry chambers, financial instruments and stakeholders in the energy sector:

- Bulgarian Association Natural Gas
- Balkan and Black Sea Petroleum Association (BBSPA)
- Bulgarian National Committee to the World Energy Council
- Energy Institute Jsc
- Center for Energy Efficiency in Industry
- Institute for Nuclear Research and Nuclear Energy
- BULATOM
- Bulgaria Energy Forum
- Bulgarian Nuclear Society
- Association of Producers of Ecological Energy
- Bulgarian Photovoltaic Association
- Bulgarian Wind Energy Association
- Energy Efficiency Fund
- Global Ecological Fund
- International Fund Kozloduy (financial instrument for decommissioning of nuclear reactors and for stimulating energy efficiency)
- Radioactive Waste Fund
- Energy Management Institute

Sample Questions:

Who are the main energy investors in the Balkans/Serbia/Bulgaria (Public/ Private/national/foreign/institutional)? What are their investment focus (RES, conventional)?

Are there noticeable national distinctions in energy investments both across EU/non-EU member states and within the energy sector?

What is the scale of energy investment in Serbia/Bulgaria (if known)? Is the scale of energy investment in Serbia sufficient to meet national goals and needs (in the case of Serbia)?

Is there a change of pace in investments since Bulgaria reached their RES targets?

Who are actors other than investors that influence energy (and specifically RES) investments in the region/Bulgaria/Serbia?

What influence does the EU/UNDP have on energy (and in particular RES) investment in Serbia/Bulgaria and generally in the Balkans?

How does national legislation foster or hinder energy (and in particular RES) investments in Serbia/Bulgaria?

What other factors (such as infrastructure, socio-economic context, geopolitics) influence energy investments (and particularly investments in RES) in Serbia/Bulgaria?

What is the future for RES investment in the region/Serbia /Bulgaria? Any particular challenges or positive trends expected in Bulgaria and/or Serbia?

What are the best data sources on energy investments in the region/Bulgaria/Serbia?

Has EU membership benefited energy (and in particular RES) investment in EU member states (such as Bulgaria, Romania, and Croatia) as compared to Serbia?

Share of GWh of electricity production from RES and Hydro

GWh of electricity produced /Total	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Serbia RES	0	0	0	0	0	0	0	0	0	0,0009	0,0009
Serbia Hydro	33	30	28	27	29	33	24	27	27	34	28
BG RES	0,0001	0,0004	0,0012	0,0031	0,0059	0,016	0,021	0,045	0,065	0,059	0,064
BG Hydro	11	10	8	7	9	12	7	8	11	11	13

Data from the International Energy Agency, calculations made by the author.

Factors	Bulgaria	Serbia
Socio-Economic Context		
Population (2016)	7.1 Million	7 Million
Economic Transition	Central to Market	Central to Market
Corruption Perception Index score/rank on 180 countries (2017)	43/71	41/77
Geographical Features	Mountain Ranges; Coastal Shore	Flat plains; Mountains; Important Hydrological network
International Organizations apart of	NATO in 2004; EU in 2007; Energy community in 2006	Energy Community
Ease of Doing Business 2018 Ranking	50th	43rd

Energy Profile			
RES% of Gross Final Energy Consumption (2015)		18%	21%
Approximate Overall Electricity Generation (2016)		45,000 GhW	38,800 GhW
Electricity production by source - Percentage	Coal/Oil	48%	73%
	Nuclear	35%	0%
	LHPP		26%
	Wind, Solar, Biomass, Geothermal	17%	1%
Electricity Loss (2014)		8%	15%
RES 2020 Consumption Target		16%	27%

Data source: World Bank, IEA