MSc Program
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The Authorization Procedures for Large-Scale Solar Photovoltaic Power Plants in Kosovo, Albania and Serbia - A SWOT Analysis

A Master's Thesis submitted for the degree of
“Master of Science”

supervised by
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Vienna, 01.06.2023

Affidavit

I, **ANNA TUTNER, BA**, hereby declare

1. that I am the sole author of the present Master's Thesis, "THE AUTHORIZATION PROCEDURES FOR LARGE-SCALE SOLAR PHOTOVOLTAIC POWER PLANTS IN KOSOVO, ALBANIA AND SERBIA - A SWOT ANALYSIS", 119 pages, bound, and that I have not used any source or tool other than those referenced or any other illicit aid or tool, and
2. that I have not prior to this date submitted the topic of this Master's Thesis or parts of it in any form for assessment as an examination paper, either in Austria or abroad.

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Abstract

In the global energy transition to renewable energy sources (RES), solar photovoltaic (PV) technology has emerged as a major participant. In Kosovo[1], Albania, and Serbia—three Western Balkan countries with considerable energy intensity obstacles—solar systems have significant unexplored potential. However, the investigation and utilization of this potential are hampered by political, technological, financial, legal, and educational barriers, which are further exacerbated by their non-EU status. The purpose of the thesis is to examine the authorization procedures for large-scale solar PV projects by examining their SWOT (strengths, weaknesses, opportunities and threats) analyses. The report presents analytical analyses and suggestions for investors and policymakers in the Western Balkans region, hoping to encourage the growth and accomplishment of large-scale PV projects by bridging the gap between academic research and real-world implementation. The research questions examine the authorization procedures' strengths and weaknesses as well as their opportunities and threats. The study reveals the challenges faced by the renewable energy sectors in these countries and suggests tactical planning measures and mitigation techniques for potential investors through an intensive literature review and analysis of the authorization procedures. To attract investment and promote sustainable development, targeted adjustments and stronger support for renewable energy projects are essential. This is true even in the face of common obstacles such as bureaucratic procedures, inadequate infrastructure, budgetary constraints, and unpredictability of the law.

Keywords: Albania, authorization procedure, Kosovo, renewable energy, renewable energy sources, RES investment strategies, Serbia, solar photovoltaic, solar power

[1] Throughout this Master's Thesis, this designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence.

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List of Abbreviations

ALPEX	Albanian Power Exchange
CAPEX	Capital Expenditure
CEB	Council of Europe Development Bank
CfD	Contract for Difference
DSO	Distribution System Operator
EBRD	European Bank for Reconstruction and Development
EC	Energy Community
EIA	Environmental Impact Assessment
EIAS	Environmental Impact Assessment Study
EIB	European Investment Bank
EPS	Elektroprivreda Srbije
ERE	Energy Regulatory Authority
ERO	Energy Regulatory Office
EU	European Union
FiT	Feed-in Tariff
GWh	Gigawatt-hour
KEDS	Kosovo Electricity Distribution Service
KESH	Albanian Power Corporation
KfW	Germany's Kreditanstalt für Wiederaufbau
KOSTT	Kosovo Transmission, System, and Market Operator
kWh	Kilowatt-hour
kWp	Kilowatt-peak
ME	Ministry of the Environment of Albania
MEE	Ministry of Economy and Environment of Kosovo
MIE	Ministry of Infrastructure and Energy of Albania
MW	megawatt
NDC	Nationally Determined Contribution
NEA	National Environment Agency of Albania
NECP	National Energy and Climate Plan
NREAP	National Renewable Energy Action Plan
NTC	National Territory Council
OSHEE	Electric Power Distribution Operator
OST	Albania Transmission System Operator
PPA	Power Purchase Agreement
PV	Photovoltaic
PVOUT	Power Output
REO	Renewable Energy Operator
RES	Renewable Energy Sources
SEA	Strategic Environmental Assessment
TSO	Transmission System Operator
TWh	Terawatt-hour
UN	United Nations
UNECE	UN Economic Commission for Europe
UNFCC	UN Framework Convention on Climate Change
USAID	United States Agency for International Development
WBIF	Western Balkans Investment Framework

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1 Introduction

1.1 Topic and Research Questions

Solar photovoltaic (PV) technology has emerged as one of the major competitors in the global energy transition as a result of the new direction toward renewable energy sources (RES) that the world is currently witnessing. A clean, widespread, and sustainable way to fulfill the rising need for energy and power while lowering carbon and greenhouse gas emissions is provided by PV. In view of current developments and issues in the energy sector, particularly regarding the energy crisis suffered in the aftermath of Russia's invasion of Ukraine, the potential of PV has captured both my general and scholarly interest. I've been looking at the possibility of RES as a possible solution because of the continuous energy issue. Additionally, the Western Balkan region's advantageous geographic position and proximity to the European Union (EU) have sparked my interest in the untapped potential of solar systems in Kosovo, Albania, and Serbia. The countries of the Western Balkans face significant energy intensity challenges, yet little investment has been made to improve energy efficiency. The generation of renewable energy from sources including hydro, wind, biomass, and geothermal in these regions represents considerable untapped potential. However, several obstacles, including political, technological, financial, legal, and educational ones as well as the fact that none of the three nations are members of the EU, impede the examination and exploitation of this potential. Despite this, all three nations are making efforts to get EU Directives adopted by their national legislatures. Examining the early phases of implementation is something I am really interested in, particularly with regard to authorization procedures for PV systems and the strengths and weaknesses of the legal systems in the three countries (Lalic *et al.*, 2011, p. 3187).

This research seeks to investigate the authorization procedures for large-scale solar PV projects in light of the vicinity of Kosovo, Albania, and Serbia before drawing results for suggestions and policy adjustments. The energy sectors of the different countries may be compared and contrasted to identify potential differences and similarities. Notably, the three countries are signatories to the Energy Community (EC) Treaty, which fosters collaboration between the EU and Southeast European countries and seeks to expand the internal energy market of the EU to this region (United States Agency for International Development and DT Global, 2021, p. 1; The Energy Community, 2022, p. 14).

The research questions are the following after having established the topic and relevance of this thesis:

What is the procedure for the authorization of large-scale solar PV projects in Kosovo, Albania, and Serbia?

What are the strengths and weaknesses of these authorization procedures?

What opportunities and threats do these authorization procedures present?

Based on the findings related to the questions above, comes an additional question:

What strategic planning measures, mitigation strategies, and recommendations can be formulated for potential investors?

My expectation with this study is to provide insight into the present status of solar PV development and identify opportunities for improvement through a thorough SWOT analysis of the permitting procedures in Kosovo, Albania, and Serbia. This study intends to give insightful analysis and suggestions for investors and policymakers in the Western Balkans region to eventually encourage the growth and success of large-scale solar PV projects by overcoming the gap between academic research and practical applications.

1.2 Methodology

To achieve a thorough examination, this thesis' methodology uses a three-pronged approach. First, a thorough review of the literature will be conducted, which will include academic journals, country reports from international organizations like the International Renewable Energy Agency (IRENA) or the EC, the national legislation of Kosovo, Albania and Serbia, as well as pertinent and recent media sources. This research procedure presents a foundation for existing knowledge and insight into the procedures for obtaining authorization for large-scale solar PV projects in Kosovo, Albania, and Serbia.

Interviewing important subject-matter experts will be the second step of this three-pronged approach. These interviews will offer valuable knowledge, opinions, ideas, and

insights on the strengths, weaknesses, opportunities, and threats associated with the authorization procedures.

For the third step of this approach, in order to carefully assess and contrast the authorization procedures in the three countries, a SWOT analysis will be completed. This study takes into account both the internal and external factors that may have an impact. The SWOT analysis acts as a structured framework for identifying critical results, generating recommendations for possible investors, and strategic planning measures.

This paper intends to give an in-depth and comprehensive overview of the authorization procedures for large-scale solar PV projects in Kosovo, Albania, and Serbia by integrating these three-pronged approaches and research techniques, as well as to provide useful insights and direction to investors in renewable energy.

1.3 Large-Scale Solar Photovoltaics - State of the Art

Solar energy is heat and light energy that is radiated outward from the Sun and can be captured utilizing a variety of ever-evolving technologies. Solar power or solar PV is the use of solar energy by direct conversion of light into electricity utilizing the photoelectric effect of the solar cells put on solar panels. The potential solar energy that might be used differs from the quantity of solar energy existing at the planet's surface because variables such as geography, temporal variations, cloud cover and the availability of land restrict the amount of solar energy that we can absorb. Geographical factors have an impact on solar energy potential since regions closer to the equator are nearer to the Sun and thus receive more sunlight. Temporal variations also affect the potential of solar energy since solar panels have less solar radiation to capture as it is less intense whether it is dark outside or cold outside. As a result, solar panels are limited in how much energy they can capture in a single day. Cloud cover is another key aspect that influences the energy generation of solar panels. Hence, this resource is regarded as an intermittent resource (United States Agency for International Development and DT Global, 2021, p. 9).

Kilowatt-hours per installed kilowatt-peak of the system capacity (kWh/kWp) are used to calculate the PV power output (PVOUT) which indicates the total amount of power produced per unit of installed PV capacity over the long term. The theoretical potential,

impact of air temperature, terrain horizon, albedo, module tilt, configuration, shading and soiling, and topographic restrictions are all factors in determining the practical PV potential, which is the power output that can be produced by a typical large-scale PV system (ESMAP, 2020, p. 9; United States Agency for International Development and DT Global, 2021, p. 9).

In Kosovo, large-scale solar PV generators are classified as those with installed capacities of more than 100 kW. For instance, the maximum allowable capacity of a single project is restricted to 3 megawatts (MW) if the generator is a member of the support scheme which is a project that benefits from a 12-year guaranteed Power Purchase Agreement (PPA) with a Feed-in Tariff (FiT), priority dispatch and liability for only 25% of their disbalance. Large-scale solar PV plants could be linked to the distribution or transmission network (United States Agency for International Development and DT Global, 2021, p. 11; Vajdic and Javshanshvili, 2021). A contract notice for the construction and operation of a solar power plant on public property was published by Kosovo and promised to speed up the legal authorization for a solar power plant for which it would grant a 15-year PPA under its first competitive procedure. It is Kosovo's first auction of its kind. The government also added in its announcement that it expects many more to come for both solar and wind energy development (Todorović, 2023). A typical large-scale solar PV plant in Kosovo is seen in Figure 1.

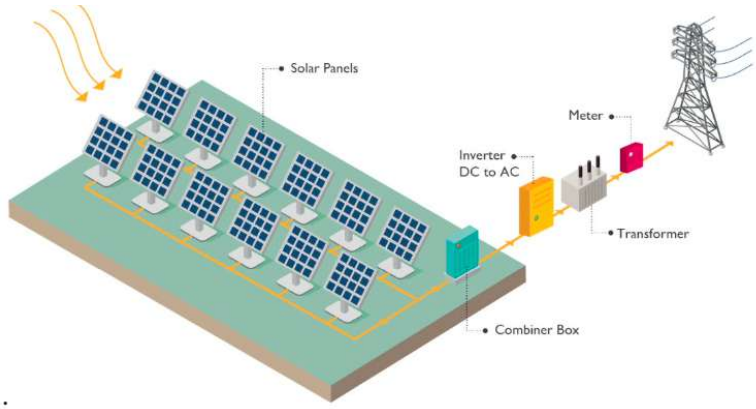

Figure 1 Kosovo Large-scale solar PV generator (United States Agency for International Development and DT Global, 2021, p. 11)

In Albania, large-scale solar PV facilities are those with a capacity greater than 2 MW (Ministry of Infrastructure and Energy, 2023, p. 15). In Serbia, large-scale solar PV plants

are defined as capacities greater than 10 MW (personal communication with Miloš Vučković and personal communication with Petar Mitrović, 2023).

1.4 Structure

After this chapter outlining the introduction and the state of the art of large-scale solar PV, the thesis continues with a thorough literature review on the international legal framework that is relevant to the Western Balkans Region (2) which establishes the importance of the EC (2.1) and EU Directives (2.2 and 2.3). The second main part of the first part of this thesis is a detailed description of the authorization procedures for developing large-scale solar PV (3) in Kosovo (3.1), Albania (3.2) and Serbia (3.3). The SWOT analysis as a research design is explored in Chapter 4 and the strategic planning measures are presented for Kosovo (5.1), Albania (5.2) and Serbia (5.3). Finally, the conclusion (6) summarizes the main findings and answers to the research questions (6.1), and the limitations of this thesis (6.2), as well as it provides an outlook for further research (6.3).

2 Overview of the International Legal Framework Relevant to the Western Balkans Region

In order to promote the switch from fossil fuels to renewable energy and fulfill the EU's obligations under the Paris Agreement to reduce greenhouse gas emissions, the EU finished a thorough reform of its energy policy framework in 2019. This framework is called "Clean Energy for all Europeans". Aiming towards a more secure, competitive, and sustainable energy system that will solve the existential problem of our time – climate change – the EU is at the forefront of the clean energy transition. The EU is establishing bold energy and climate goals for 2030, which are a clear indication of the way forward. Along with these goals, it offers a solid legal foundation to support the necessary investments. At the same time, the Contracting Parties (CPs) to the EC are also already incorporating the Directives into the EU Acquis Communautaire. Therefore, Kosovo, Albania, and Serbia would need to transpose it into their legislation frameworks (United States Agency for International Development and DT Global, 2021, pp. 49–50). As Kosovo has not yet become a full member of the United Nations (UN), it should be noted at this point that it is not a signatory to the Paris Agreement. Therefore, it has not yet made any commitments to the UN Framework Convention on Climate Change (UNFCCC) regarding emission reductions or filed a Nationally Determined Contribution (NDC). (Ministry of Economy, 2022, p. 10).

Whereas, Albania has made commitments to various international agreements related to climate action, including the Paris Climate Change Agreement in 2016 which requires countries to submit the previously mentioned NDCs towards reducing greenhouse gas emissions and report progress to the UN within the UNFCCC. Additionally, Albania is an EU candidate since 2014 and is currently in the process of incorporating EU legislation into its legal framework. In the context of energy efficiency, the EU has created a regulatory structure that encompasses the Energy Efficiency Directive 2012/27/EU which was revised in 2018 (European Training Foundation, 2022, p. 33).

In addition, Serbia also engages to ensure compliance with international agreements accepted and ratified, such as the Paris Agreement in 2015, the Green Deal of the European Commission in 2019, the Podgorica joint statement on the transition to clean energy in 2019, and the Sofia Declaration on the Green Agenda of the Western Balkans 2020

(Ministry of Mining and Energy of the Republic of Serbia, 2022, p. 1). The Sofia Declaration on the Green Agenda of the Western Balkans is an additional document serving as a component of the EU initiative to the Western Balkan region in the efforts of becoming carbon neutral by the year 2050 (Wolf Theiss, 2022, p. 201). Under the Sofia Declaration Kosovo also agreed to reach net-zero emissions by 2050 and signed the Declaration in 2020 (Ministry of Economy, 2022, p. 10).

2.1 Energy Community

To expand the EU's internal energy market to neighboring countries, the Energy Community (EC) was established. The primary goals of this EC Treaty are to develop a regulatory and market structure that can encourage investments for a consistent and sustainable energy supply. The signatory parties agreed to adopt significant EU energy legislation within a specific time frame by ratifying the EC Treaty. In October 2005, the Treaty that established the EC was signed in Athens. Once the parties ratified it, the Treaty became effective on July 1, 2006. The EU and nine CPs, including Albania, Bosnia and Herzegovina, Georgia, Kosovo*, North Macedonia, Moldova, Montenegro, Serbia and Ukraine currently are parties to the Treaty. Observers under Article 96 of the Treaty are Armenia, Norway and Türkiye. The EC Acquis has undergone considerable expansion since 2006, encompassing a wide range of new directives and regulations. The Acquis covers various areas of legislation, including but not limited to electricity, gas, oil, infrastructure, renewable energy, energy efficiency, competition and state aid, environment, statistics, climate and cybersecurity (Energy Community Secretariat, 2022, pp. 11–12). The EC Treaty unites the EU and its neighbors to build an integrated pan-European energy market, and as well the Republic of Kosovo is a signatory since December 2005 (United States Agency for International Development and DT Global, 2021, p. 48). The Republic of Serbia, as well as Albania, joined the EC in 2006. The Republic of Serbia committed to implementing European Directives on RES (Directive 2001/77/EC) for the promotion of electricity produced from RES by signing the Treaty (Vajdic and Javshanshvili, 2021, p. 63).

As members of the EC, Kosovo, Albania and Serbia are still working to bring their legal systems into compliance with EU law and their governments want to establish clear and transparent lines of accountability for implementing EU Acquis. The three countries

continue to enact new policy initiatives that support the removal of development-blocking obstacles, the attraction of investment, the promotion of energy security and the boosting of the flexibility of power systems (Vajdic and Javshanshvili, 2021, p. 11). According to the Annual Implementation Report of 2022 by the EC Secretariat, Albania has successfully met its 2020 renewable energy target and is leading the way in the execution of auctions for renewable energy projects (Energy Community Secretariat, 2022, p. 24).

In conclusion, it can be stated that the main objective of the EC is to establish a secure, uniform regulatory framework and market space that guarantees reliable energy supply, attracts investments, strengthens environmental conditions and energy efficiency, and increases the use of RES. Kosovo, Albania, and the other CPs agreed to transpose and put into effect any pertinent Acquis Communautaire governing the energy industry in accordance with Article 20 of the EC Treaty (United States Agency for International Development and DT Global, 2021, p. 48).

2.2 Renewable Energy Sources (RES) Directive 2009/28/EC and the EU Directive 2018/2001 on the Promotion of the Use of Energy from Renewable Sources

RES Directive 2009/28/EC is a directive on renewable energy and it is mandatory for EC CPs. In accordance with this directive, only energy generated by RES installations is placed into operation after the directive becomes effective, or the enhanced capacity of an installation that was renovated after that date shall be included in the fulfillment of the target. Each CP is expected to create a National Renewable Energy Action Plan (NREAP) which includes information and details on sector-specific objectives in order to help guarantee the successful implementation of the RES Directive 2009/28/EC. One significant approach to achieving the RES Directive's target is to ensure the appropriate operation of national support schemes in order to sustain investor trust and to allow CPs to build effective national measures to meet required targets. The directive specifies a support scheme used by a CP or a group of CPs to advocate for the use of energy from RES by decreasing the cost of that energy, raising the price at which it can be sold, or increasing the amount of that energy that is purchased whether through a renewable energy obligation or other means. This encompasses, for instance, financial aid for investments, tax benefits or exemptions, refunds of taxes and support schemes of renewable energy obligations including those that use green certificates and direct price support schemes, such

as energy FiTs and premium payments. The CPs can implement domestic or regional support schemes in collaboration with other CPs in order to meet the national RES targets, according to Article 3 of the directive. In regard to solar energy, the CPs are required to verify that certified systems and equipment in accordance with EU standards, such as eco- and energy labels and other technical reference systems, are used. In accordance with this directive, the contracting parties are required to inform the EC if they plan to set up a single administrative body that is in charge of processing authorization, certification and licensing applications for renewable energy installations as well as helping applicants. They must also report to the EC if they have any provisions in place for implementing a system that will automatically approve planning and permit requests for renewable energy installations when the authorizing body has not responded within the specified time frames (L 140/16 Official Journal of the European Union, 2009; United States Agency for International Development and DT Global, 2021, pp. 48–50).

According to the EC Secretariat's Annual Implementation Report (released on November 1, 2022), Kosovo reported a 24.40% share of RES in 2020 and came extremely close to hitting its 25% objective of that year. Albania exceeded the objective of 38% in 2020 with a RES share of 45,01% of total energy consumption. Serbia recorded a 26,30% proportion of renewable energy in 2020 coming close to meeting its 27% goal (Energy Community Secretariat, 2022).

RES Directive 2009/28/EC was updated by EU Directive 2018/2001 which was enacted in 2018. The directive prescribes that the EU must achieve a target of at least 32% of its energy originating from renewable sources by 2030 (after an assessment this target might be reviewed). The EU Directive 2018/2001 has been incorporated into the Acquis Communautaire. According to this directive, a further requirement is that any support scheme chosen by a CP must be provided in an accessible, transparent, competitive and cost-effective way. This support scheme has to take the shape of a market premium, which might be either sliding or fixed. The directive further states that the time it takes to award a permit for a power plant, taking into account all necessary steps taken by competent authorities, must not exceed two years. This timeframe may be extended by up to one year in cases where it is properly justified by the existence of extraordinary circumstances (L 140/16 Official Journal of the European Union, 2009; United States Agency for International Development and DT Global, 2021, pp. 48–50).

2.3 EIA Directive 2011/92/EU and SEA Directive 2001/42/EC Strategic Environmental Assessment

Regarding the protection of nature, there is a need for significant measures to ensure appropriate implementation and enforcement of the EU Directives on Environmental Impact Assessment (EIA) and on Strategic Environmental Assessment (SEA), including the EIA Directive 2011/92/EU and the SEA Directive 2001/42/EC. Energy-related initiatives must adhere to both national and international regulations and commitments regarding the preservation of nature. Furthermore, the standard of environmental reports, particularly concerning the evaluation of the impact on biodiversity and nature and the assessment of cumulative project impacts, should be enhanced (European Training Foundation, 2022, p. 36).

2.4 Main Providers of Finance in the Western Balkans

The Council of Europe Development Bank (CEB), the European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB), Germany's Kreditanstalt für Wiederaufbau (KfW), the World Bank, the French Development Agency (AFD) and the United States Agency for International Development (USAID) are just a few of the international donors and multilateral banks that continue to channel funding to Southeast Europe, also through the Western Balkans Investment Framework (WBIF). Through financial and technical support for strategic investments, especially in infrastructure, renewable energy, energy efficiency and growth of the private sector, the WBIF endorses socioeconomic development and EU accession throughout the Western Balkans along with 600 million euros (Vajdic and Javshanshvili, 2021, p. 14). In addition, the Green for Growth Fund (GGF) is the first specialist fund in Southeast Europe and the Caucasus for expanding renewable energy. It offers refinancing to institutions to increase their involvement in the renewable energy sector. In 2009, the EIB and Germany's KfW established the GGF as a public-private cooperation (Vajdic and Javshanshvili, 2021, p. 13).

3 Authorization Procedures for Developing Large-Scale Solar Photovoltaic in Kosovo, Albania and Serbia

In the pursuit of sustainability and RES, the development of large-scale PV projects has gained considerable momentum in particular in the Western Balkans. This chapter examines the laws and authorization procedures regulating the development of such projects in Kosovo, Albania, and Serbia. This study aims to provide a thorough analysis of the legal and administrative landscape that shapes the implementation of PV projects in this region, with a focus on regulatory frameworks, bureaucratic processes (e.g., obtaining permits), environmental protection through EIA, and ultimately the connection to the grid. This chapter aims to contribute to the effective development of large-scale PV systems in Kosovo, Albania, and Serbia, thereby enabling them to foster their sustainable energy transition.

3.1 Kosovo

Specific authorization procedures for constructing large-scale PV projects in Kosovo are covered in this section. This chapter seeks to give insights and an analysis of the solar energy potential in Kosovo, the national RES policies, legal framework, stakeholder analysis, and the streamlining of the authorization procedure for successful implementation by looking at the legal and administrative frameworks controlling PV project authorization.

3.1.1 Solar Energy and its Potential as a Renewable Energy in Kosovo

According to information from the Global Solar Atlas and USAID, Kosovo has an average daily yield potential of 3.696 kWh/kWp, or 1,200 - 1,350 kWh/kWp annually, for every kW of installed solar PV capacity (United States Agency for International Development and DT Global, 2021, p. 9; The World Bank Group, 2023b). A power output of 3.696kWh/kWp is regarded as favorable for new solar PV development on a worldwide scale and provides a respectable return on investment (United States Agency for International Development and DT Global, 2021, p. 9).

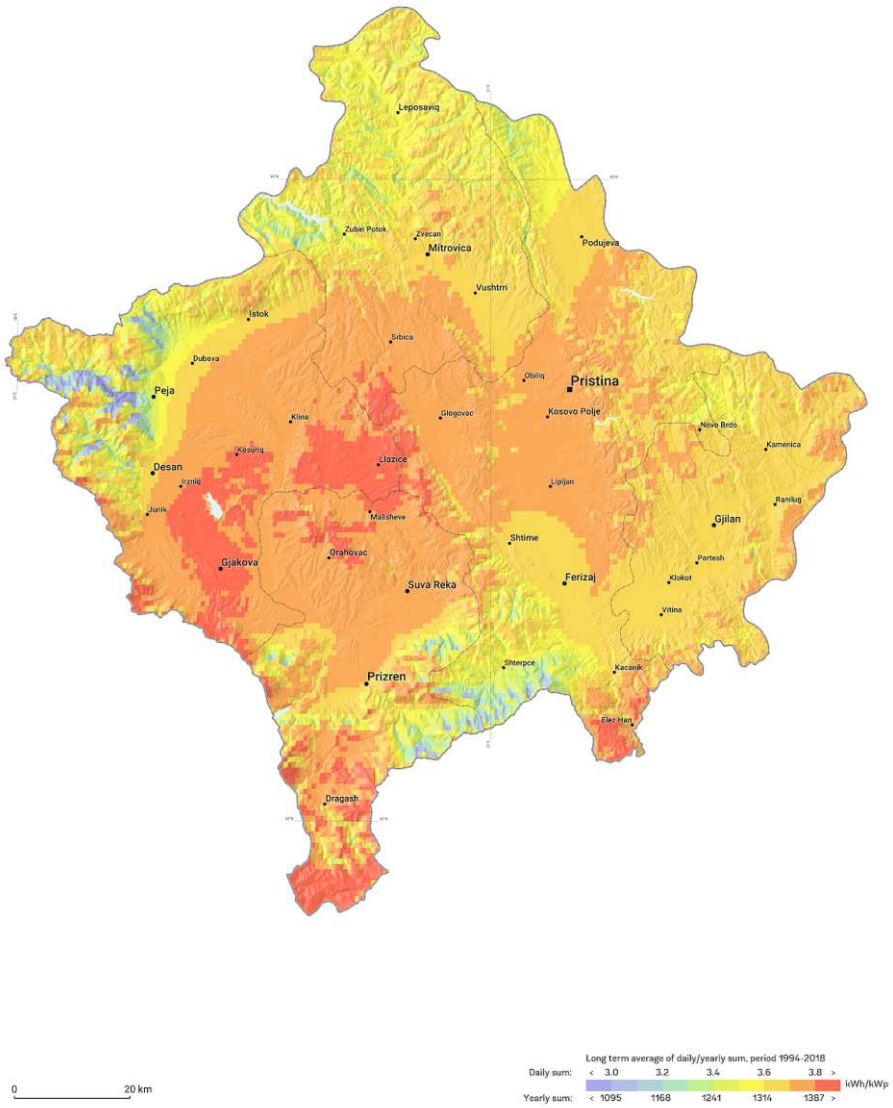

Figure 2 PV Power Potential Kosovo (The World Bank Group, 2019b)

3.1.2 Kosovo Energy Strategy and RES Policy

The Republic of Kosovo's 2017-2026 Energy Strategy was approved by the Assembly in January 2018. The strategy was created in compliance with the EC Treaty, EU regulations and global standards for sustainable development, environmental and social protection, energy source diversification and promoting the use of RES. The strategy is founded on a number of targets, including the security of a reliable, high-quality supply of electricity with the capacities needed for a stable electricity system, the inclusion in the regional energy market and the accomplishment of commitments in the areas of energy efficiency, RES and environmental protection. On the other hand, the strategy also highlights major challenges that need to be resolved regarding outdated and insufficient generation capacities to meet the demand for electricity consumption (notably in the cold season) and for

power system reserve and balancing, as well in relation to a potential underutilization of RES generation. The strategy's ultimate goal is to promote cleaner energy, with the target of integrating 400 MW of RES into the system by 2026 which is in accordance with EU targets. Supporting overall economic growth, enhancing energy supply security, and the protection of the environment are the three energy policy milestones to achieve and they form part of the general long-term goal of the energy strategy which is the use of RES in energy generation. Taking those three energy policy milestones into consideration, the application of fiscal and financial incentives for all types of RES, e.g., in the form of support schemes based on the mechanisms of certificates of origin, is essential (United States Agency for International Development and DT Global, 2021, p. 54).

However, the Energy Strategy of 2017-2026 was replaced by the Energy Strategy of 2022-2031 because it had become out of date as a result of the suspension of Russian gas deliveries to Europe and as a result of the necessity to restructure Kosovo's Energy Strategy in order to meet the demands of the latest developments in Kosovo, the region and in Europe. Kosovo must implement key environmental, energy and climate laws as it is a member of the EC. To make the process of implementing the Energy Strategy easier, the legal and regulatory framework, including the Clean Energy Package, the Governance Regulation, the Electricity Directive, the Risk Preparedness Regulation, the Energy Efficiency Directive and the Climate Law, will undergo revision (Ministry of Economy, 2022, p. 10). The updated strategy also stresses the investment in RES and calls for a rapid expansion of RES, predominantly in the form of wind and solar energy, with the help of renewable energy auctions and government investment (Ministry of Economy, 2022, p. 11). It also calls for four main goals (Ensuring the security of supply, Achieving sustainability and climate neutrality, Improving competitiveness and Maintaining affordability) and five strategic objectives serving as policy directions (Improving system resilience, Decarbonization and promoting renewable energy, Increasing energy efficiency, Strengthening regional cooperation and market functioning and Protecting and empowering consumers, and workforce development) (Ministry of Economy, 2022, p. 25).

In regard to Kosovo's NREAP 2013 reporting the status of all obligations to the EU and EC, Kosovo achieved a 24.40% share of renewable energy which almost met its target of 25% for the year. Still, the contribution of renewable energy to electricity remained

significantly low (Ministry of Economic Development, 2013; Energy Community Secretariat, 2022, p. 78).

3.1.3 Kosovo Laws Applicable for Photovoltaic Projects

The Kosovo laws that are essential for PV projects are covered in this chapter's section. It reviews three significant parts of legislation: Energy Law No. 05/L-081, Electricity Law No. 05/L-085, and Energy Regulator Law No. 05/L-084. These rules establish the foundation for Kosovo's PV project regulations, covering a number of issues with regard to energy production, electricity distribution, and the function of the energy regulator. To navigate the legal system and guarantee compliance in the PV industry, one must have a solid understanding of these regulations.

3.1.3.1 Law on Energy No. 05/L-081

The Law on Energy No. 05/L-081 was approved in 2016 and lays down the fundamental guidelines and standards that control activities in the energy sector. The Law is also in accordance with RES Directive 2009/28/EC, which is described in more detail in Chapter 2.3. In addition to that, the law requires the government to implement the NREAP in accordance with the EC regulations. According to this law, the Transmission System Operator (TSO) or the Distribution System Operator (DSO) has to prioritize power produced by RES in compliance with the Grid Code, connection methodology and other laws and codes. The TSO or DSO is obligated to present any new RES producer with a thorough and detailed evaluation of the costs linked with the connection for which the system operator can impose a charge that reflects its reasonable costs. The Energy Regulatory Office (ERO) is required to make sure that RES operators are not subjected to unfair conditions while paying connection and use fees for the transmission and distribution networks (Official Gazette of the Republic of Kosova / No. 24, 2016; United States Agency for International Development and DT Global, 2021, pp. 57–58).

3.1.3.2 Law on Electricity No. 05/L-085

The Law on Electricity 05/L-085 was also approved in 2016 and it specifies the terms under which electricity is generated, distributed, and traded and how the Kosovan electricity market is structured. Article 8 of the law takes reference to the Certificates of Origin for renewable energy, which is a digital document provided by the ERO that

certifies to the final customer that a certain amount of energy is generated from RES (Official Gazette of the Republic of Kosova / No. 26, 2016; United States Agency for International Development and DT Global, 2021, p. 58).

3.1.3.3 Law on the Energy Regulator No. 05/L-084

The Law on the Energy Regulator No. 05/L-084 was also approved in 2016 and outlines the authority, obligations and responsibilities of ERO. These include licensing requirements, processes for authorization procedures for the construction of new power plants, the development of competitive energy markets and the standards for controlling rates and terms of energy supply. The law is also in compliance with the RES Directive 2009/28/EC concerning the promotion of the use of energy from RES, as well as it complies with Directive 2009/72/EC on common rules for the internal market in electricity and Regulation 714/2009/EC on conditions for access to the network for cross-border exchanges of electricity. According to this law, two methods for increasing Kosovo's RES generation capacity are specified, namely the Authorization Process (Article 43) and the Tendering Process (Article 44). The Authorization Process is managed by ERO which enacted the Rule on Authorization of New Generation Capacity which will be further explained in Chapter 3.1.6 (Official Gazette of the Republic of Kosova / No. 25, 2016; United States Agency for International Development and DT Global, 2021, pp. 58–59).

3.1.4 Market Readiness

This chapter evaluates Kosovo's market readiness for solar PV electricity. Kosovo's readiness to adopt solar PV technology can be assessed by researching important mechanisms such as the Rule on Support Scheme, FiTs, the Regulated Framework and the Renewable Energy Fund. A comprehensive overview of Kosovo's market readiness and its potential for sustainable solar PV growth is given by outlining them.

3.1.4.1 Rule on Support Scheme

The methods for supporting energy produced from RES are defined in the Rule on Support Scheme No. 10/2017, enacted by ERO in 2017. A RES generating plant must produce energy from one or more of the qualified RES, be situated within Kosovo's territory, and be equipped with new and unused generating equipment to qualify for the support scheme. As only the applicant who applies to ERO to acquire the authorization can be

considered to be accepted to the support scheme, eligibility for the support scheme and the authorization procedure for the construction are closely linked. The applicant's eligibility for the support scheme along with the associated FiT is determined by the notice for Decision on preliminary authorization or the decision on the final authorization given by ERO. The maximum size of a single solar PV plant that is eligible under the program is set by the rule at 3 MW installed capacity. Solar PV projects approved for the support scheme are eligible to use the FiT to purchase their power from the market operator under a PPA for a 12-year period. In addition to receiving priority connection to the pertinent network and priority dispatch, they will be responsible for 25% of their overall imbalance costs. The commercial contract under which the generator sells the power produced by RES is the PPA. According to this rule, the market operator must agree on a PPA template from the regulator. The market operator is the body responsible for entering into such agreements with generators of RES. The PPA includes important terms that govern the agreement's effectiveness, invoicing and payment relationships, balancing obligations and other important requirements for RES generators (United States Agency for International Development and DT Global, 2021, p. 61).

3.1.4.2 Feed-in Tariffs

ERO authorized in 2019 to give incentives to solar power plants with an installed capacity of 20 MW and the FiT for generators who were chosen on a first-come, first-served basis was set at EUR 85.5 per MWh for a duration of 12 years. The PV systems with an installed capacity of less than 3 MW are eligible for the support scheme. However, Kosovo's* State Aid Commission (SAC) examined the newly introduced support scheme and claimed that the incentives were unlawful. Therefore, ERO is required to halt payments from the support scheme and SAC instructed ERO to start a legal framework assessment aimed at bringing it into compliance with EU regulations on state aid for renewable energy. In addition, according to SAC, the objective should also be to develop market-based systems for allocating incentives and to substitute FiTs for feed-in premiums (Spasić, 2020).

3.1.4.3 Auction Scheme

Kosovo announced its first solar auction as of mid-May. A contract notice for the construction and operation of a solar power plant on public property was published by

Kosovo. The area in Kramovik was chosen for connection capacity ranging from 95 to 105 MW. Kosovo would grant a 15-year PPA under its first sector-specific auction scheme. Investors can submit proposals until August 15, 2023, for connection capacity ranging from 90 MW to 105 MW for a location in the municipality of Rahovec. The chosen bidder will have two years to commission the solar power facility. When the ERO certifies that Kosovo has developed a functional, liquid day-ahead market, the PPA will be changed into a Contract for Difference (CfD). Morevoer, authorities believe that both solar and wind energy production will see further growth (Todorović, 2023).

3.1.4.4 Regulated Framework

Small and large RES-generating plants that are not part of the support scheme may sell their energy produced under the Regulated Framework conditions or under market-based unregulated conditions. To qualify for the Regulated Framework, the RES generating facilities have the right to sell their electricity produced to the market operator under a PPA at a price determined annually by ERO, they are responsible for their imbalance costs (except RES generating facilities with an installed capacity of 500 kW or less), they have priority in examining the application for the connection to the relevant system and are entitled to priority dispatch. This is also further explained and described in Chapter 3.1.6 (United States Agency for International Development and DT Global, 2021, pp. 63–64).

3.1.4.5 Renewable Energy Fund

All electricity supplies in Kosovo are liable to a Renewable Energy Charge which provides access to the Renewable Energy Fund. The market operator compensates the additional expenses spent to assist the development of RES projects accepted to the support scheme through the Renewable Energy Fund. A report to the regulator on the operation of the Renewable Energy Fund is submitted quarterly by the market operator. The Renewable Energy Fund covers the expenses of the difference between the reference price and the FiT, and the compensation for the imbalance costs (United States Agency for International Development and DT Global, 2021, p. 65).

3.1.5 Stakeholder Analysis

This subchapter looks at the institutional setting, stakeholder analysis, and legislative framework surrounding the large-scale solar PV industry in Kosovo. KOSTT (Kosovo

Transmission, System, and Market Operator), KEDS (Kosovo Electricity Distribution Service), ALPEX (Albanian Power Exchange) and other significant players are examined. These organizations play a crucial role in safeguarding the efficiency of the electricity market. The Kosovo Assembly, the ERO, and the Ministry of Economy and Environment (MEE) are some of the main public entities that are examined additionally. These organizations have substantial influence over the laws, rules, and decision-making procedures that affect the electricity industry.

3.1.5.1 Key Electricity Market Participants

The Key electricity market participants are the KOSTT, ALPEX and the KEDS. The KOSTT – Transmission, System and Market Operator J.S.C. is a publicly traded company and the Republic of Kosovo fully owns the shares. In accordance with the Law on Electricity, the Assembly of the Republic of Kosovo shall implement the shareholder's rights. Market Operator and TSO are the two assigned roles of the KOSTT. In line with the Market Rules established by the ERO, the Market Operator is in charge of organizing, managing and operating the electricity market across Kosovo. The TSO is in charge of ensuring the grid's long-term capacity to meet the needs for electricity transmission and system balancing. Kosovo's transmission system is managed by KOSTT and runs with high voltage 400 kV, 220 kV and 110 kV lines. In 2020, the TSO of Kosovo KOSTT and of Albania OST agreed to create ALPEX which is a power exchange company. ALPEX will run both countries' short-term electricity markets and for its establishment, the Shareholders' Agreement and Articles of Association were signed. The operator is in charge of the day-ahead market coupling between Albania and Kosovo and is expected with the possibility of eventually expanding its activities to the intraday market sector (United States Agency for International Development and DT Global, 2021, pp. 68–69). The KEDS – Kosovo Electricity Distribution Service J.S.C. is the DSO of the Republic of Kosovo and is in charge of operating, maintaining and developing the distribution system, and as well as connecting the distribution system to other systems while ensuring that the system has enough capacity to meet reasonable electricity distribution demands. All across Kosovo, the KEDS, a joint stock company, operates and is, therefore, the exclusive distributor. KEDS transmits electricity to customers under the licenses of the ERO (United States Agency for International Development and DT Global, 2021, pp. 68–69). Kosovo has made progress in implementing electricity unbundling which involves separating ownership and operation of the electricity transmission and distribution systems to

promote fair competition. KOSTT, the TSO, was unbundled and certified in 2019, while KEDS, the DSO has been unbundled since 2015 and a compliance program was created. A compliance report for 2021 was prepared and approved according to the law (Energy Community Secretariat, 2022, p. 73).

3.1.5.2 Key Public Entities

The key public entities are the Kosovo Assembly, the ERO, and the MEE. The Kosovo Assembly is the legislative body and is directly elected by popular vote. In the area of energy, the Assembly approves the Kosovo Energy Strategy after reviewing and adopting draft legislation and decisions. The Committee receives regular and ad-hoc basic reports from the ERO and the KOSTT (United States Agency for International Development and DT Global, 2021, pp. 69–70). The ERO is an independent institution tasked with overseeing the activities in Kosovo's energy sector including electricity. The ERO is tasked with granting and supervising that these licenses are upheld by the energy companies. It also has the authority to establish tariffs for public service activities, to impose obligations on the population's supply, to settle disputes and to create secondary legislation drafts for the energy sector. ERO is also in charge of developing a regulatory framework that guarantees that the energy market operates transparently and impartially based on free market principles. ERO establishes open and transparent criteria and standards for the construction of new energy plants and for granting authorizations to energy companies, as well it enjoys the authority to issue, amend, suspend, transfer, withdraw, oversee and regulate whether the energy companies comply with these authorizations. ERO is supported by licensing payments, allowing it to operate as a financially independent regulatory institution and it assists and oversees Kosovo in complying with the Acquis Communautaire (United States Agency for International Development and DT Global, 2021, p. 70).

The MEE of Kosovo is the ministry in charge in terms of strategy and policy. In accordance with the Law on Energy, MEE is in charge of creating a ten-year energy action plan and setting renewable energy targets that are fully compliant with EU regulations. In order to establish strategies for meeting those targets and to promote RES, MEE prepares sub-legal acts (administrative instructions). In addition, it is also tasked with concluding agreements for international collaboration in project development and renewable energy support schemes. In addition to that, environmental, building and water-related consents and permits are also issued by MEE. After a revision of the EIA report that investors

interested in renewable technology have undertaken, the environmental consent is issued by MEE. MEE also establishes the framework through secondary legislation and municipalities are instructed by MEE to issue Municipal Environmental Permits (United States Agency for International Development and DT Global, 2021, pp. 70–71).

3.1.6 Authorization Procedure

The Rule on Authorization Procedure for construction of new generation capacities from RES defines large-scale RES generating capacity which is any new grid-connected project that is more than 100kW (United States Agency for International Development and DT Global, 2021, pp. 60–61). The Rule on Authorization is divided into general, technical and financial requirements and it consequently defines the criteria for the final authorization. The rule also specifies that an applicant must provide ERO with proof that the project conforms with the Energy Strategy of Kosovo and other relevant requirements including those to safety, security and finances. Additionally, all projects must adhere to EU technical requirements. The final authorization is part of the regulator board's decision and it contains conditions that have to be met in order for the construction to take place. Consequently, if the applicant constructs the planned solar PV plant and is not in accordance with the outlined requirements, ERO has the right to revoke the authorization. The regulator's decision establishes the timeline for the project to start and finish, subject to certain project characteristics. The final authorization is the legal document that grants permission to the applicant to start constructing the RES plant (United States Agency for International Development and DT Global, 2021, pp. 60–61). The Rule on Authorization Procedure governs that the renewable energy investor must first acquire the necessary documentation and permits from the relevant Kosovan institutions before submitting the official request to ERO for authorization to construct new generating energy plants. The "Certificate of Usage" is the document issued by a relevant institution that certifies the compliance of the construction with the construction documentation and relevant construction codes and the construction's suitability for usage. Part of the required set of documentation submitted to ERO includes, e.g., a business certificate issued by the Agency for Business registration in Kosovo, evidence on the financial capability of the applicant, evidence on the legal and property rights where the new generation capacity is going to be constructed, technical and financial feasibility study (for the project with an installed capacity above 1 MW), a business plan detailing the project's technical specifications and a financial plan (including the overall investment costs), a municipal act

stating that the proposed energy project is permitted by municipal development or spatial plans, connection agreement with KEDS or KOSTT, water permit (if required) and issued by the Ministry of Environmental, Spatial Planning and Infrastructure or relevant Municipality, an environmental consent (issued by the relevant entity, if for the subject project is required), a water permit and a construction permit (United States Agency for International Development and Renewable Energy Source in Kosovo, 2023, pp. 3–4). The requirements for connection points in TSO and DSO levels with regard to the generating capacity of solar PV parks are defined by the TSO Network Code and the DSO Grid Code. Depending on the connection level, it is recommended to receive the necessary technical information from the applicable institution which is from the TSO (KOSTT) or the DSO (KEDS). New generating plants with a capacity over 10 MW are automatically applied to the TSO. Before signing the connection agreement and integrating the plant into the transmission or distribution, both - the TSO and the DSO – require technical approval (United States Agency for International Development and Renewable Energy Source in Kosovo, 2023, p. 5). Construction and environmental criteria must be carefully taken into account while implementing renewable energy projects in Kosovo. The Kosovo Assembly enacted laws on environmental protection (No. 03/L-025) and on construction (No. 04/L-110) which specify the environmental and construction standards in great detail. An investor must have both a construction permit and environmental consent in order to receive ERO's authorization for the plant's installation. According to Law No. 08/L-81 on EIA, a prospective investor developing a large-scale energy project is required to obtain environmental consent from the Ministry of Environment, Spatial Planning and Infrastructure. The EIA report for projects is required before the environmental consent is issued and each project is examined individually in line with the standards established by the Law on EIA to decide whether they require an EIA assessment or not (United States Agency for International Development and Renewable Energy Source in Kosovo, 2023, p. 8). A RES investor shall submit then an application for authorization to ERO as soon as the required set of documentation and permits has been obtained (United States Agency for International Development and Renewable Energy Source in Kosovo, 2023, p. 16). The next step is in accordance with the Law on Energy Regulation and Rule on Licensing of Energy Activities in Kosovo. A RES investor who aims to construct a new generation capacity over 5 MW is required to apply for a generation license. Upon submission of the Certificate of Usage (issued from the relevant authority) and once the RES investor has finished the construction of a new generating capacity, ERO will consider

the project completed. The issuance of authorization from ERO, along with the required technical approvals from the pertinent energy institutions, enables the RES investor to sign a PPA with the market operator. At the moment, RES investors have two options for selling the electricity they produce from RES: a Regulated Framework or market-based conditions. A PPA with the market operator is ensured by the Regulated Framework which also offers a reference price that has been approved by the regulator. Investors have the option of selling their generated electricity for unregulated rates depending on open market circumstances, but this does not ensure that a PPA will be concluded with the market operator. The PPA for an investor has a minimum length of one year and may continue for as long as the investor's generation license is valid (specified by the Regulated Framework and Rule for Support Schemes). However, the PPA should also not exceed 15 years if the investor is not obliged to acquire a generation license (United States Agency for International Development and Renewable Energy Source in Kosovo, 2023, p. 18).

3.2 Albania

In this chapter, Albania's specific authorization procedure for constructing large-scale PV projects is described. An assessment of Albania's solar energy potential is presented first, followed by a review of the national renewable energy strategy, the legal framework, stakeholder analysis and the streamlining of authorization procedures for successful project development.

3.2.1 Solar Energy and its Potential as a Renewable Energy in Albania

The Global Solar Atlas reports that Albania has an average daily yield potential of 4.043 kWh/kWp, or 1,461 kWh/kWp yearly for every kW of installed solar PV capacity. Power outputs of 4.043 kWh/kWp are thought to be suitable for new solar PV development globally and offer an acceptable return on investment (ESMAP, 2020, p. 10; The World Bank Group, 2023a).

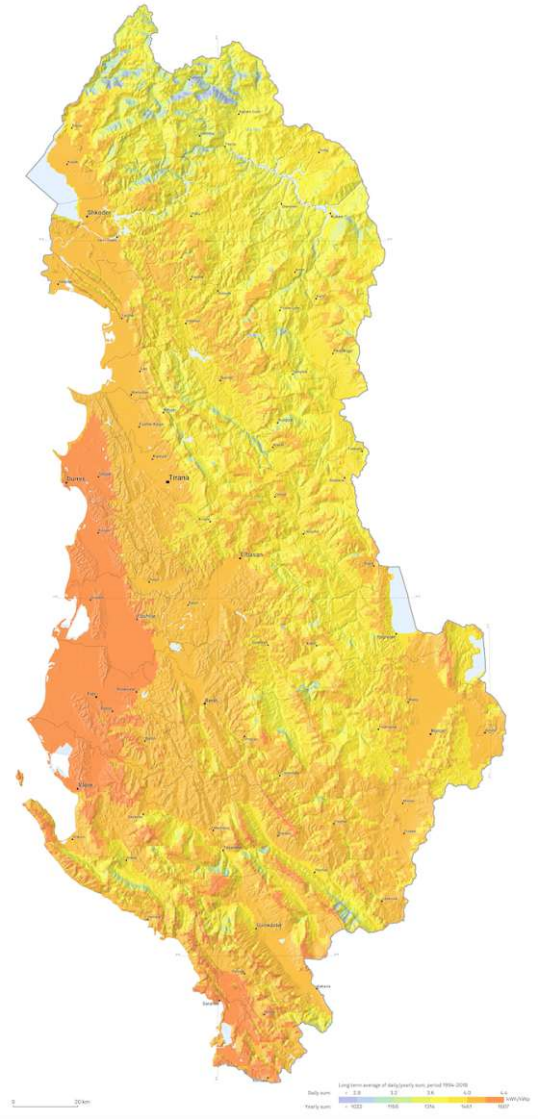

Figure 3 PV Power Potential Albania (The World Bank Group, 2019a)

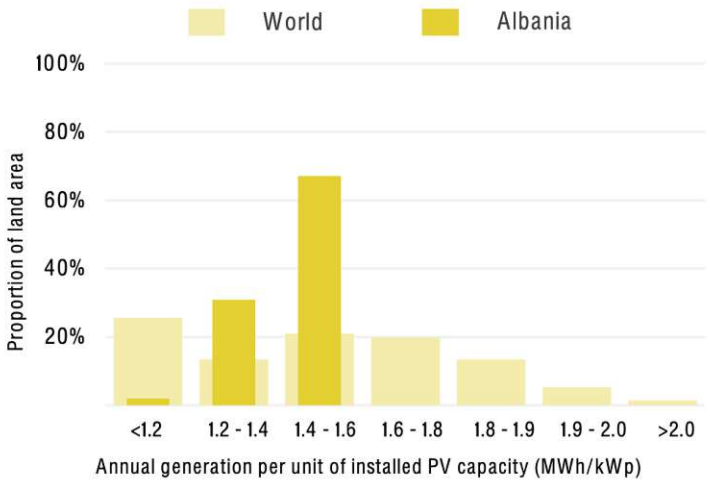

Figure 4 Distribution of Solar Potential Albania (International Renewable Energy Agency (IRENA), 2022a)

Albania aims to diversify its energy production sources by incorporating solar energy, leveraging its advantageous meteorological conditions. PV stations are the subject of more extensive research and tender solicitation in contrast to wind energy. In terms of production, solar energy is anticipated to play a more prominent role in the immediate future (European Training Foundation, 2022, p. 54). In Albania, solar PV power plants increased slowly, from 0 to 15 MW between 2017 and 2019 (Vajdic and Javshanshvili, 2021, p. 11). With a total of eight solar power plants with a combined installed capacity of roughly 15 MW, renewable electricity production increased to 23 GWh in 2019 (Vajdic and Javshanshvili, 2021, p. 20).

3.2.2 Albania Energy Strategy and RES Policy

Albania has pledged its commitment to the Paris Climate Agreement and is currently in the process of aligning its legal framework with that of the EU, as it is a candidate country. As part of its efforts, Albania has introduced various policies and laws aimed at promoting energy diversification through the use of RES such as solar and wind power. Additionally, the country has taken steps to enhance energy efficiency and to create a more competitive energy market that enables consumers to switch energy providers (European Training Foundation, 2022, p. 42). Albania remains at the forefront position of implementing auctions for renewable energy projects and accomplished its 2020 renewable energy goal. Still, there is a need for more action to improve energy efficiency, particularly given the ongoing energy crisis. For instance, the enforcement of regulations concerning EIAs was not sufficient. Albania has taken the first step in developing its draft of the National Energy and Climate Plan (NECP), and while the Governance Regulation has been partially implemented, there is still a long way to go with the transposition of the 2021 electricity legislation on the new Renewables and Energy Efficiency Directives (Energy Community Secretariat, 2022, p. 18). Important stages for Albania in the transition of energy and the development of renewable energy were the development of the draft of the NECP of the Republic of Albania and the revised NREAP. The EC urged Albania to create the NECP which is being submitted in 2021. The draft includes a comprehensive ten-year planning phase from 2021 to 2030. Every two years, an integrated summary of the implementation's progress will be published. Energy efficiency, research and innovation, renewable energy, greenhouse gas (GHG) reductions and interconnections are the topics covered by the NECP (Vajdic and Javshanshvili, 2021, p. 25). The Albanian Government unveiled the NREAP which entails the incorporation of 740 MW of PV and wind energy into the

national energy system (European Training Foundation, 2022, p. 9). Another strategic document that the government of Albania has created, is the National Energy Strategy 2018-2030. To advance the diversification of energy sources and promote the use of renewables, the National Energy Strategy has realized a goal of 38% renewable energy consumption in 2020, with a new target of 42% renewable energy consumption by 2030 established in the revised version of the strategy (Republic of Albania Council of Ministers, 2020; European Training Foundation, 2022, p. 31). Enhancing energy efficiency is a key objective of the national strategy, which seeks to diminish energy loss from 25% to 11% and enhance efficiency by as much as 15% by 2030. Companies responsible for energy distribution and transmission are making substantial investments in interconnection infrastructure (European Training Foundation, 2022, p. 55).

3.2.3 Albanian Laws Applicable for Photovoltaic Projects

The Power Sector Law No. 43/2015 governs, inter alia, that transmission and DSO guarantee network access for all customers and users of the system, on an open, non-discriminatory basis, and at ERE-approved and disclosed tariffs (The Assembly of the Republic of Albania, 2015; Vajdic and Javshanshvili, 2021). Part of the Power Sector Law is the essential document for an investor of large-scale solar PV projects, namely the “Market Rules”. The market rules refer to specific regulations that outline how the market will be managed, how participants can register, how the electricity system will be balanced, the rules for calculating the imbalance of the balancing responsibilities parties, how they will be held financially accountable in the event of an imbalance, and other matters regarding how the market operates (The Assembly of the Republic of Albania, 2015, p. 5; Ministry of Infrastructure and Energy, 2023, p. 15).

Another relevant law for the development of large-scale solar PV is the newly amended Law No. 24/2023 on "Promotion of the use of energy from renewable sources" which is described in further detail in Chapter 3.2.4.

3.2.4 Market Readiness

This subchapter evaluates Albania's market readiness for solar PV electricity. Albania's readiness to adopt solar PV technology can be assessed with the Law for Promoting the Use of Energy from Renewable Resources by researching important mechanisms such as

the premium tariff or CfD. Outlining them provides a thorough picture of Albania's market readiness and its potential for sustainable solar PV growth.

The Albanian government supports the use of RES and the support scheme for renewable energy is rated at 72% which means there is still room for improvement. The Renewables Law outlines support mechanisms of renewable energy production such as FiTs and the CfD but also auctions with a fixed purchase price have been conducted. The fixed purchase price auctions are intended to be converted into CfD contracts once the market for buying and selling renewable energy becomes more developed. In addition to that, as of April 1, 2021, all renewable energy producers are now required to balance the energy they produce (Energy Community Secretariat, 2022, p. 24).

The FiT is part of the current support scheme for small solar projects (< 2 MW). The government of Albania received technical support from the EBRD to create an auction mechanism that adheres to the best international norms for competitive procurement of renewable capabilities for plants larger than 2 MW. The first round of the Albanian solar auction for the construction of a 100 MW facility was launched and granted in 2019 (this project was put on hold). The second solar auction round for 140 MW was held in 2020 and the third round, totaling 100 MW was announced in the same year as well. The offtake agreement for PV facilities with a capacity greater than 2 MW includes a guaranteed offtake by the Electric Power Distribution Operator (OSHEE) exclusively for the output part (European Bank of Reconstruction and Development (EBRD), 2021, p. 16). Albania launched its second PV auction in 2020, and the French business Voltalia proposed a price of 24.89 EUR/MWh (Vajdic and Javshanshvili, 2021, p. 24). The Premium tariff or CfD is available to large-scale renewable energy power plants whose installation capacity exceeds those determined by the FiT. FiTs are given to qualified small-scale renewable energy power facilities, which include solar PV plants up to 2 MW. For CfDs, competitive bidding amongst the bidders set the tariff. The auction's terms and conditions are approved by the Council of Ministers in accordance with its criteria. These criteria may restrict the adoption of particular technologies due to resource diversification requirements or network connection prices. Similar to FiT, the CfD is projected to last for 15 years. The electricity market price is currently based on the Albanian power exchange price. As a measure of support, producers can sell their electricity on the market and get the variable difference between the auction price and the electricity market price. The

producers are obligated to pay the difference if the electricity market prices are greater than the price set forth in the auction. 2020 saw the start of Albania's second auction bidding phase for a 140 MW solar PV facility at Karavasta with half of the installed capacity being eligible for a CfD tariff of 24.89 EUR/MWh and the other half being sold at the market rate. The contract was finalized in May 2020 and constructions started in 2022. For the development of a 100 MW solar PV plant called Spitalla in the Durrs region, another auction bidding round was initiated at the end of 2020. Of this capacity, 70 MW will be eligible for CfD with a price ceiling of 55 EUR/MWh (Vajdic and Javshanshvili, 2021, pp. 32–33).

On April 14, 2023, the Albanian Parliament adopted Law No. 24/2023 on "Promotion of the use of energy from renewable sources". So far, it is only available in Albanian and there is no official English translation of the law yet. This law also explains the support schemes. Support for electricity generation from RES can take one of the following forms: PPA, CfD, or in the form of a FiT agreement. Prior to the establishment of an advanced day-ahead electricity market, support may be provided in the form of a PPA, which may be converted to a CfD after the establishment of the advanced day-ahead electricity market. The form of the support scheme shall be determined by the Ministry prior to the initiation of a competitive procedure. In addition, the Renewable Energy Operator (REO) is the contracting party of qualified priority generators for support under this law through a support contract or for support through the FiT system through PPAs. The REO administers the Renewable Energy Support Fund, which is used primarily to cover the costs of the support schemes as follows: differences to be paid between the guaranteed price and the reference price for priority generators, support in the form of a CfD, and payments received for priority generators, support in the form of premium contracts (The Assembly of the Republic of Albania, 2023)

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3.2.5 Stakeholder Analysis

The Albanian energy sector is carried out by a variety of different stakeholders involved in policy definition and implementation and in the provision of services to citizens. The section that follows briefly outlines the key public authorities and key electricity market participants in the Albanian energy sector that make up Albania's existing institutional structure for the electricity sector. Two crucial organizations that establish policy and regulate the Albanian power industry are the Energy Regulatory Authority (ERE) and the

Ministry of Infrastructure and Energy (MIE) (Vajdic and Javshanshvili, 2021, p. 29; European Training Foundation, 2022, p. 32).

3.2.5.1 Key Electricity Market Participants

The Albanian Power Corporation (KESH) is Albania's largest generator of energy. The most crucial power-producing facilities in the nation are run by KESH. Along with ensuring and managing the technical and operational safety of the power plants, the KESH is also in charge of their administration, proper operation and management. The firm is gradually evolving from a monopoly into one of the nation's major power generation corporations operating in a liberalized market (Vajdic and Javshanshvili, 2021, p. 30). Approximately 70% of domestic generation is provided by KESH. Due to the removal of KESH's role as a wholesale public supplier in the middle of 2016, the company is now solely recognized as an electricity generator. KESH supplies electricity to regulated customers, compensates for network losses and is Albania's sole provider of balancing services (European Bank of Reconstruction and Development (EBRD), 2021, pp. 14–15)
The TSO (OST) is a legal body with a license to carry out the activity of transmitting electricity and that owns the transmission system and upholds the independence concept as outlined in Article 54 of Law No. 43/2015 on Power Sector, as amended (Article 54 The Assembly of the Republic of Albania, 2015). The OST is a publicly traded enterprise with 100% state ownership. In addition to operating the market and the dispatch mechanism, the OST also serves as the transmission network (Vajdic and Javshanshvili, 2021, p. 30). The Albanian Power Exchange (ALPEX) was founded by the TSO (OST) and KOSTT (Kosovo). The purpose of the exchange is to enable day-ahead market coupling between the two countries to commence at the end 2021. At a later time, it is anticipated that ALPEX will expand its offerings to the intraday market segment (European Training Foundation, 2022, p. 33).

The above-mentioned major state actors make up the majority of the Albanian electricity market, which is still mostly state-owned: KESH, as a public utility; OSHEE, as a distribution company; and OST, as TSO (European Bank of Reconstruction and Development (EBRD), 2021, p. 15).

3.2.5.2 Key Public Entities

Energy-related activities in Albania are governed by the ERE which is a public entity that is self-governing, public and non-profit. Its duties are overseeing all electricity market operations in Albania as well as regulating activities in the natural gas and electricity sectors. It also establishes and enacts regulations for the electricity market (European Training Foundation, 2022, p. 30). The primary objective of the Albanian ERE is to guarantee the provision of a reliable and sustainable supply of electricity to customers through the creation of a functional and competitive electricity market while also overseeing the activities of electricity generation, transmission, distribution and supply. ERE engages in price and tariff negotiations with three national energy operators, namely KESH, OST and OSHEE, the latter of which happens to be the largest public electric power distribution operator in Albania. In order to produce, transmit, distribute, provide ad exchange electricity, the ERE grants the required permits. For all qualifying power producers from renewable sources, the regulator establishes electricity pricing including FITs. ERE also described the producers' typical buying arrangements (European Training Foundation, 2022, p. 32).

The MIE and its dedicated directorates with responsibility for energy policies are tasked with formulating and implementing national policies in various sectors, including energy and the utilization of energy resources. Additional responsibilities in these areas fall under the authority of the Ministry. The MIE is in charge of the entire energy sector which involves the revision and updating of the National Energy Strategy, the creation of energy policies, market reforms to meet national objectives and adhere to EU directives, promotion of energy efficiency and RES, and the encouragement of investments in the energy sector. Additionally, authorizing and granting concession rights for the construction of power plants in Albania falls under the purview of the MIE (European Training Foundation, 2022, p. 32). Other key public entities to mention are the Ministry of the Environment (ME) or the National Environment Agency (NEA).

3.2.6 Authorization Procedure

The following describes the key permits for the development, construction and operation of a PV plant in Albania without support measures. Phases 1-16 describe the development for the construction of large-scale solar PV. The project owner starts the authorization procedure during Phase 1 by submitting a request for project development and the project

owner is in charge of filling out and submitting the application. For this phase, there is no time limit. In phase 2, the public introduction of the project is done by the MIE. This phase attempts to spread knowledge and awareness of the project at an early stage. This task is carried out by the MIE and normally takes 15 calendar days to accomplish. In phase 3, the MIE gives the project preliminary approval which is an essential step in the whole procedure. Within 45 calendar days after submission, the MIE is in charge of assessing the whole request and providing the preliminary approval. Phase 4 of the project sees the final approval of power plants with installed capacities greater than 2 MW granted by the Albanian Council of Ministers and those with installed capacities up to 2 MW granted by the MIE. Final approvals must be granted by the Albanian Council of Ministers and the MIE, and this procedure normally takes 20 calendar days after the whole request is submitted. Phase 5 is where the development contract is executed between the project owner and the MIE. This step involves both parties and both are responsible for its completion. In phase 6, the project owner must pay the development contract guarantee which is equal to 5% of the investment. The project owner is exclusively responsible for making the payment at the time the development contract with the MIE is signed. The project implementation program, the EIA, technical characteristics and prefeasibility study are just a few of the project-related documents that must be prepared in phase 7. These preparations are carried out by licensed bodies that the project owner hires. The project owner is in charge of this task and the time required for the preparation varies depending on the situation. In phase 8, the ME or the NEA must determine if the project needs to undergo an environmental impact assessment study (EIAS). The project owner hires licensed entities or natural persons to prepare the EIAS in phase 9. In phase 10, while the ME approves the detailed EIAS, the NEA approves the preliminary EIAS. The NEA is in charge of the preliminary EIAS, while the ME is in charge of the detailed EIAS. The preliminary EIAS may take up to 45 to 75 calendar days after the whole request is submitted but the detailed EIAS may take up to 120 calendar days after the complete request. The preparation of project-technical documentation, such as conceptual solutions, designs, and as-built documentation is part of phase 11. Phase 12 requires the project owner to secure the requisite land rights for the PV plant location. Phase 13 involves reviewing and approving the development and construction permits for the PV plant by the National Territory Council (NTC). The issuance is handled by the NTC and the development permit takes 20 business days to process. After the infrastructure impact tax has been paid, the approval of the construction permit takes around 55 business days and

it is issued after 110 business days. Phase 14 involves the examination and granting of development and construction permits for the connecting infrastructure by local authorities, such as the municipality. Following the filing of a full application, the local authorities (Municipality) are in charge of issuing the permits. The development permit process takes 20 business days, while the Construction permit process takes about 45 business days. The connection agreement and the grid connection approval are both part of phase 15. The DSO is in charge of the connection agreement while the TSO is in charge of approving the grid connection. The term for TSO is 60 days following the submission of the entire request, and the period for DSO is 20 business days following the submission of the complete request. In phase 16, the project owner notifies the authorities that construction work has begun. The project owner is in charge of this activity, and the notification must take place as soon as the construction permit is issued, but no later than one year following issuance. The project owner is in charge of phase 17, which entails building and running the PV facility. The terms outlined in the final approval, development contract, and construction permit determine how long these activities will last. Phase 18 is where the use permit for the PV plant is issued by the NTC or local authorities (municipality). This is the responsibility of the municipality or the NTC. In phase 19, the task of facilitating the PV plant's connection to the grid is taken on by the TSO or DSO. The ERE is in charge of issuing the energy permit that authorizes the PV plant to produce energy. The ERE has authority over the issue of the energy permit. After the whole request is submitted, the activity lasts for around 130 calendar days. A full list of the process of the key permits for the development, construction and operation of a PV plant in Albania without support measures is also provided in Appendix A.6. However, this procedure is only partially applicable to PV projects auctioned by the government as the process starts with the auction and not with a private application procedure and timeframes could be shorter depending on concessions given by the government in the agreement with investor (personal communication with Anisa Rrumbullaku (karanovic partners), 2023).

3.3 Serbia

This section examines specific authorization procedures for setting up large-scale solar PV plants in Serbia. The chapter seeks to present relevant information and analysis of Serbia's solar energy potential, national renewable energy policy, legislative framework, stakeholder analysis, and the streamlining of the project licensing process. It thoroughly explains the procedures involved in utilizing Serbia's solar energy potential looking at the legal and administrative frameworks controlling PV project authorization.

3.3.1 Solar Energy and its Potential as a Renewable Energy in Serbia

Serbia has an output potential of 3.520 kWh/kWp on average per day or 1,314 kWh/kWp annually for every kW of installed solar PV capacity, according to the Global Solar Atlas. 3.520 kWh/kWp power outputs are considered to be sufficient for new solar PV development globally and to provide a reasonable return on investment (The World Bank Group, 2023c).

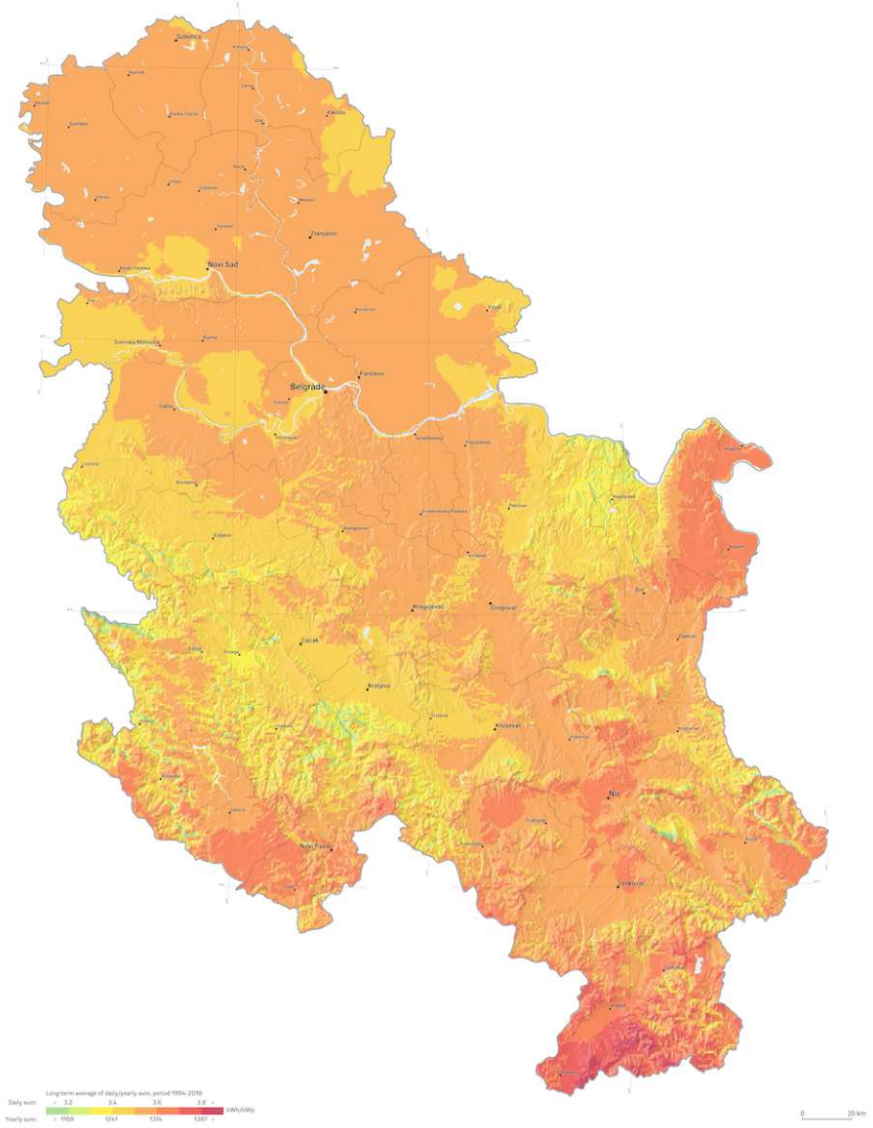

Figure 5 PV Power Potential Serbia (The World Bank Group, 2019c)

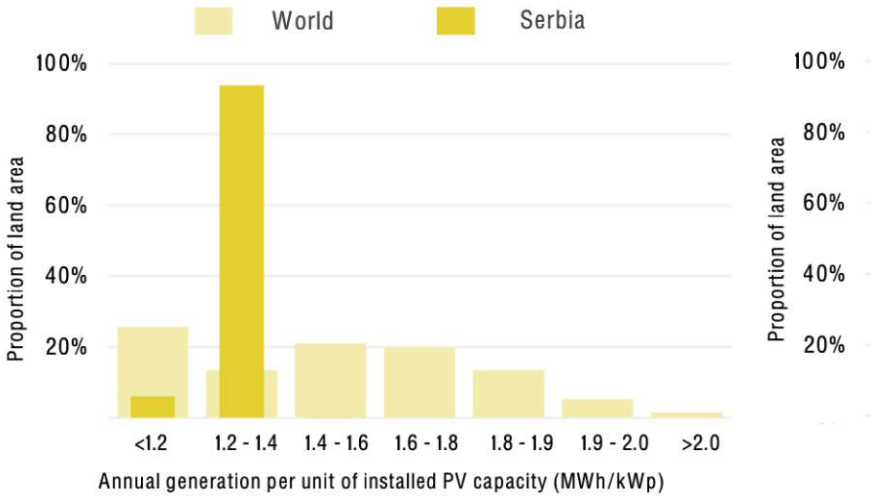

Figure 6 Distribution of Solar Potential Serbia (International Renewable Energy Agency (IRENA), 2022b)

Despite having a greater solar potential than Germany, Poland and the Czech Republic, Serbia does not produce as much solar energy as those nations do. In order to compete in that field, it is vital to begin utilizing solar energy (Ladjevac, 2022, p. 4). In Serbia, the expansion of solar PV power plants was quite slow with only 11 MW added between 2017 and 2019 (Vajdic and Javshanshvili, 2021, p. 11).

3.3.2 Serbia Energy Strategy and RES Policy

New capacities for the production of electricity from renewable sources have been continuously expanding since 2013 when the National Renewable Action Plan was enacted (Vajdic and Javshanshvili, 2021, p. 60). Instead of existing capacity, the number of newly constructed capacities represents a more important measure of this expansion. The major cause of this is that larger renewable energy power plants are being built with caution by investors and international financial institutions because this is a new market sector for Serbia. About 250 renewable energy power plants with a combined capacity of 500 MW have already been completed (until 2021) and 65 more power plants with a total capacity of 264 MW are being developed (as of 2021) (Vajdic and Javshanshvili, 2021, p. 60). The Ministry responsible for energy is tasked with overseeing the execution of the National Renewable Action Plan and providing a biennial report to the Government on its progress (Vajdic and Javshanshvili, 2021, p. 63). In 2021, the Law on Amendments to the Law on Energy was passed, which aims to align domestic regulations with the EU's standards while addressing the shortcomings that were identified in the previous law. The law also addresses the electricity sector. Furthermore, the Law on the Use of RES aligns Serbia's regulations with the new EU directives on renewable energy. The law aims to promote energy savings, ensure energy security, reduce the impact of the energy industry on the environment and climate change, and encourage sustainable use of resources. One of the provisions of the law is the establishment of the Administration for Financing and Encouraging Energy Efficiency under the Ministry of Mining and Energy, which would replace the current Budget Fund for Improving Energy Efficiency. This would allow for the attraction of EU grants and funds from international financial institutions to increase energy efficiency, with the funds being accessible to citizens (Republic of Serbia, 2021b, p. 2). In addition, with the approval of new secondary legislation, Serbia made substantial progress in the transposition of the renewable energy acquis. It took many years for the new incentive structure to be introduced, for investors' trust in the system's functionality to grow and for appropriate projects – in particular large-scale power plants to be prepared

(Vajdic and Javshanshvili, 2021, p. 60). A total of 92.3 MW of RES plants were added to the grid under the FiT model in 2016 and 2017 and 222 more RES generating facilities have been constructed by 2018. Serbia produced 1,847,657.74MW/h electricity from RES producers profiting from making use of these FiTs (Wolf Theiss, 2022, p. 200).

By 2030, Serbia should obtain 40% of its energy from renewable sources, based on the proposed integrated energy and climate policy (Ladjevac, 2022, p. 1) within the NREAP of 2013. The Law on Energy (Official Gazette of RS, No. 145/2014 and 95/2018) formerly controlled the usage of RES, albeit it did not go far enough in regulating the use of RES. Additionally, more thorough regulation of this area was required given that the Republic of Serbia is a member of the EC. According to the National Action Plan for Renewable Energy Serbia was expected to reach a share of 27% in RES in its total gross final consumption by 2020, but by 2021 it was barely at 20% of total consumption (Ladjevac, 2022, pp. 1–2).

3.3.3 Serbia Laws Applicable for Photovoltaic Projects

3.3.3.1 Law on the Use of Renewable Energy Sources

Four energy laws and amendments were passed by Serbia in April 2021, including the Law on Use of Renewable Sources (RES Law) were adopted. Along with pertinent secondary legislation like the Feed-in Premium Decree, created a solid legal and regulatory foundation for auctions to award CfD (Ladjevac, 2022, p. 1). By passing the RES Law which also incorporates EU Directives, a new chapter in the RES movement and engagement started (Wolf Theiss, 2022, p. 197). The Republic of Serbia demonstrated its commitment to setting up the conditions for the power production out of RES on the widest scale feasible by passing a law that specifically addresses RES. The Republic of Serbia's public interest and special relevance in using energy from renewable sources are both stated in Article 2 of the Law on the Use of RES (Republic of Serbia, 2021a; Ladjevac, 2022, p. 2). The Law on RES covers actions and activities that will be implemented to achieve long-term objectives, such as minimizing the use of fossil fuels and expanding the use of RES to safeguard the environment and reduce long-term reliance on imports of energy. The Law on Use of RES offers a variety of incentives for renewable energy producers in order to entice investment and it helps Serbia to accomplish the target of 27% of RES in total electricity consumption (Ladjevac, 2022, p. 2). Serbia's passing of the

Law on the Use of RES was well-received by the UN Economic Commission for Europe (UNECE). Its implementation has yielded positive results, elevating Serbia to the ranks of nations with functional energy efficiency policies (Ladjevac, 2022, p. 3).

3.3.3.2 Serbian Laws Regulating the Energy Sector and Authorization Procedure of Large-Scale Photovoltaic

In Serbia, the energy sector is regulated by several key legal and strategic documents, including the Energy Law, the Energy Sector Development Strategy, the Program of the Energy Development Strategy and the Energy Balance of the Republic of Serbia. These documents set the objectives for the security of energy supply and provide guidelines for the adoption of other relevant legislation. The Energy Law (Official Gazette of the RS, No. 145/2014, 95/2018) addresses various aspects of the energy sector, including energy policy objectives, energy source supply conditions, customer protection, construction of new energy facilities and market organization and functioning. The Energy Sector Development Strategy, the Program of the Energy Development Strategy and the Energy Balance are used to implement and dilute the energy policy of the Republic of Serbia (Republic of Serbia, 2021b, p. 1). A variety of rules govern Serbia's ability to build plants and carry out the activity of generating energy from those plants. The sources of legislation in Serbia are classified into numerous groups of regulations. The set of laws regulating the planning and construction of facilities comprises the Law on Planning and Construction, the Law on the Spatial Plan of the Republic of Serbia and any applicable bylaws and other rules. Spatial plans (regional spatial plans and spatial plans of local self-government units and of areas for special use) and urban development plans (urban master plan, general regulating plan and detailed regulating plan) are examples of planning documents. The Law on Planning and Construction and its applicable bylaws govern the area of facility construction and prescribe the procedure for receiving information on locations and location requirements, the construction permit and the operation permit. Whereas the planning documents define the goals of spatial planning and development, e.g., whether it is intended to construct a specific facility in a specific location within a given time frame. It is important to acquire the technical requirements for connecting the power grid along with other requirements in order to qualify for the aforementioned permits. The Energy Law, the Strategy of Development of the Energy Sector of the Republic of Serbia, applicable bylaws and other regulations govern the issuance of energy permits, the connection of facilities to the grid and the obtaining status as electricity producer from RES

and their right to incentives. The main laws regulating the area of environmental protection and protection and use of natural resources are the Law on Environmental Protection, the Law on EIA, the Law on Strategic EIA, the Law on Waters, and other laws on pollution prevention and control, air pollution, nature protection and forests. Administrative procedures are those required to obtain various permits issued by the state authorities and supporting documentation and the corresponding deadlines for the issuance of such acts are established by the applicable administrative act. The General Administrative Procedure shall be applied if such dates are not specified in the corresponding regulation (Kovacević and Lazarević, 2016, p. 85). The process for connecting the generating facility to the power grid is also governed by the Energy Law, and as well by the Decree on Conditions of Supply of Electricity, the Rules on the Operation of the Distribution System and the Rules on Operation of the Transmission System (Kovacević and Lazarević, 2016, p. 96) (Kovacević and Lazarević, 2016, p. 94).

The Law on Planning and Construction specifies the location requirements which are a public document containing information on the possibilities and restrictions for construction on cadastral lots that fulfill the requirements for the construction permit and that contain the requirements for the preparation of technical documentation necessary for the issuance of the construction permit. The Ministry of Construction, Transport and Infrastructure or the competent authority of the autonomous province should provide the location criteria for the construction of solar PV plants of a total capacity of 10 MW or more (Kovacević and Lazarević, 2016, p. 96).

The corresponding water management act in Serbia is the Law on Waters which particularly distinguishes general and special uses of water. The documents called “Water Conditions”, “Water Consent” and “Water Permit” are to be issued within the process for creating technical documentation for the construction of new solar PV plants that might have a long-term or short-term impact on changes in the water regime or that might jeopardize environmental goals (Kovacević and Lazarević, 2016, p. 99).

The applicable law for an EIA in Serbia is the Law on EIA and the Rulebook on Contents of the Application for the Need to Assess the Impact and Contents of the Application for Determining the Scope and Contents of the Study of EIA. Those two laws and their

accompanying bylaws establish a thorough process for developing an EIA study for a solar PV plant (Kovacević and Lazarević, 2016, p. 104).

3.3.4 Market Readiness

Briefly, this section evaluates Serbia's market readiness for solar PV electricity. Literature research on important mechanisms such as the support schemes, FiTs and PPAs is conducted. A comprehensive overview of Serbia's market readiness and its potential for sustainable solar PV growth is given by outlining them.

As mentioned beforehand, a revised Energy Law came into force in 2014 which is also known as Serbia's commitment under the EC Treaty. The revision introduces a number of novelties such as the ability for RES producers to enter into a PPA with the guaranteed public supplier as soon as they are granted temporary status as privileged producers and to sell all their electricity output to the guaranteed public supplier at the FiT that was placed in at the time of signing the PPA for a 12-year period. Additionally, producers gained the right to construct the grid connection point themselves at their own costs and on behalf of the TSO who served as the investor and assisted the construction (Wolf Theiss, 2022, p. 201). In 2021, the implementation of a new RES Law and a revised Energy Law took effect. The new RES implements EU Directives and governs, e.g., the guarantees of electricity origins and international cooperation in the field of RES. In contrast to the prior FiT approach, the new RES law introduces market premiums that are allocated through a public auction procedure. RES producers were granted FiT under the 2014 Energy Law until the end of 2019. Many RES producers in the market are still covered by the 12-year term of the 2014-model PPA and receive the benefits of these FiT for the length of those PPAs. The current RES Law specifies the Market Premium, which is a support mechanism that is added to the market price of the electricity that the RES producer delivers to the market (in euro cents per KWh). According to the available quotas set forth by the Serbian government, market premiums are given through an auction procedure. The premium can be earned for all or a portion of the capacity of the RES plant and it is paid monthly based on the amount of RES electricity sent to the grid. The auction process for market premiums is conducted by the corresponding ministry. The stages to obtain the right to a market premium include the qualification, the bidding and, lastly, the selection of the best bidder. Participants are competing with one another for offering the lower market premium during the bidding phase without going above the

established maximum incentive purchase price. Participants are arranged in ascending rank of lower market premium to highest market premium (e.g., electricity purchase price) and this ranking remains up until the quota for their particular type of facility is filled (Wolf Theiss, 2022, pp. 203–204). No auctions have been held but Serbia announced in December 2022 that it plans to hold auctions to develop renewable energy plants (1400 MW of total capacity) to increase Serbia's total installed capacity to 2000 MW (Spasić, 2022).

Another support scheme in Serbia is the market premium agreement which is outlined in a separate decree as a contract for CfD. The market premium agreement is made between Elektroprivreda Srbije (EPS) and the RES producer and differs from the 12-year 2014-model PPA as it is for a 15-year incentive period starting with the first market premium payment. Other incentives for RES producers in Serbia comprise the right of priority access to the transmission/distribution/closed distribution system and the guarantees of origin of power produced from RES (issuance by the TSO upon) (Wolf Theiss, 2022, p. 204).

A set of decrees comprising the PPA Decree, the Fit Decree and the Status Decree were approved by the Serbian government in 2016 with the purpose of implementing the Energy Law with regard to RES. The Fit Decree's original expiration date was 2018, however, it was extended to 2019. The incentives package included, e.g., priority in access and free access to the transmission/distribution system, the obligation for the guaranteed supplier to purchase all of the electricity produced by the privileged producer for a period of 12 years under the PPA for guaranteed favorable pricing and the exemption of the privileged producer from the balancing responsibility. As mentioned beforehand, the FiT Decree was in effect until the end of 2019 and a fresh set of incentive measures has not been adopted yet by the government (Schnell et al., 2021, p. 256).

3.3.5 Stakeholder Analysis

In this chapter Serbia's key electricity market participants and key public entities are outlined, as well as their responsibilities within the Serbian electricity sector relevant for the development of large-scale solar PV are described.

3.3.5.1 Key Electricity Market Participants

JP "Elektromreža Srbije" (JP EMS) operates the transmission system in Serbia and EPS Distribucija operates the distribution system in Serbia. They are both public enterprises (Kovacević and Lazarević, 2016, p. 94). The state-owned EMS was founded to manage energy transmission, transmission system management, and market organization. In order to support both domestic and international (regional) transmission of electricity over the next ten to twenty years, EMS, the operator of the Serbia's electricity transmission system, proposes to invest substantially in infrastructure. Although the Serbian energy market has been liberalized for a while, EPS, the government-owned power generation and public supplier, still controls the majority of it. In Serbia, EPS provides roughly 98% of consumers, effectively holding the position of a dominating market participant. Additionally, the organization handles all aspects of domestic supplies (Schnell et al., 2021, p. 256). Elektrodistribucija Srbije (EDS) is Serbia's DSO and another key electricity market participant (Energy Community Secretariat, 2022).

3.3.5.2 Key Public Entities

The Constitution, the Energy Law and the Law on Ministries establish the institutional framework for the energy sector. The main governing bodies in the Republic of Serbia's energy sector are the Government, the Ministry of Mining and Energy and the Energy Agency of the Republic of Serbia (AERS). AERS is authorized by the Energy Law to perform specific responsibilities and AERS implements measures that contribute to achieving a range of objectives, including ensuring a secure energy supply through an efficient and sustainable operation of the energy system, in line with the Republic of Serbia's energy policy which incorporates environmental protection and the promotion of RES. AERS facilitates the development of Serbia's electricity market and its integration into the regional and pan-European electricity market. Furthermore, it is responsible for approving market and technical rules, developing system plans and establishing pricing methodologies for accessing electricity transmission and distribution (Republic of Serbia, 2021b, p. 4).

3.3.6 Authorization Procedure

For the plant construction in Serbia, a certain procedure has to be followed, starting with compiling technical documentation, gathering information on the location, obtaining an

energy permit, constructing the structure, carrying out the technical examination of the structure and eventually obtaining the operating permit. The construction of structures only officially starts once a construction permit has been obtained and it is performed based on the issued construction permit with its technical examination which is regulated in the Law on Planning and Construction. According to the Rulebook on Energy Permits, the requirement for the issuance of the construction permit is the gathering of information on the location. After gathering the information on specific location requirements, the process of getting the energy permit can be performed. There is no obligation to acquire an EIA as part of the process of obtaining a construction permit for solar PV plants unless the plant is constructed in a special purpose area, a protected natural area, or another area that calls for an assessment. Based on the Decree on the List of Projects for which the EIA is mandatory or requested ("Official Gazette of RS", No. 114/08) a level of the protection regime is established. The levels are ranging from 1 – solar energy plants can be constructed-, to 2 – solar energy plants are limited to a total capacity of 50 kW -, to 3 – solar plants with a total capacity of up to 100 kW can be constructed (Republic of Serbia, 2008; Kovacević and Lazarević, 2016, pp. 88–89). To construct solar PV plants that exploit natural resources or to carry out energy activities an energy permit is required (Wolf Theiss, 2022, p. 196). The application for the issuance of the construction permit includes the energy permit. The requirements for constructing an energy-producing plant are outlined in the Energy Law and in the Rulebook on Criteria for the Issuing of Energy Permits. Plants with a capacity of 1 MW and above require an energy permit and it is issued and granted by the Serbian Ministry of Mining and Energy. Conditions according to the Energy Law (Article 33) such as a reliable and safe operation of the power system, the requirements for identification of location, the possibility of connecting the facility to the existing power system, energy efficiency, environmental protection, the investor's ability to finance the energy project and the facility's contribution to the National Action Plan have to be followed (Republic of Serbia, 2014; Kovacević and Lazarević, 2016, p. 91). The Ministry of Mining and Energy issues an energy permit (in compliance with the Energy Law) within 30 days and it is valid for three years and can be extended for a maximum of one more year (Wolf Theiss, 2022, p. 206).

The Law on Planning and Construction and the Rulebook on Location Requirements outline the documentation that is required to construct a solar PV plant. The application for the location requirements incorporates a mandatory concept design of the future structure

and proof that the administrative tax for submitting the application was paid (Kovacević and Lazarević, 2016, p. 96).

In addition, a construction permit will only be issued after receiving the water conditions and the water consent, which are necessary if the solar PV plant utilizes water from rivers, lakes or subterranean rivers, or discharges water or other elements into them (Wolf Theiss, 2022, p. 196). The same authority that issues the construction permit also grants the building use permit which confirms that the solar PV plant is in compliance with the construction permit and other technical requirements (Wolf Theiss, 2022, p. 196). Therefore, the construction of an energy plant is subject to water requirements and water consent and the building use permit will only be provided once the water approval has been granted (Wolf Theiss, 2022, pp. 206–207).

An essential step in constructing a large-scale solar PV plant is the conduction of an EIA. Throughout the energy permit application process, it is vital to evaluate potential environmental implications and suggest environmental protection measures. An EIA for a large-scale PV solar plant may be requested by the competent authority as a pre-condition of issuing the construction permit (Kovacević and Lazarević, 2016, p. 102). In some circumstances, such as if the plant produces more than 50 MW of electricity of heat, an EIA has to be performed on a mandatory basis (Wolf Theiss, 2022, p. 196). Therefore, an EIA is required for the issuing of the energy permit and the location conditions which must be met for the construction permit. The project must fulfill minimal technical requirements in order to determine if an EIA is necessary. An EIA has to be completed (and authorized) before an electricity plan with a capacity greater than 50 MW is constructed. For a plant generating a capacity between 1 MW and 50 MW, the competent authority can request an EIA (Wolf Theiss, 2022, pp. 205–206).

The Law on Planning and Construction sets down the requirements and the way in which a solar PV plant is constructed, based on the construction permit and the technical documentation. The technical documentation includes a general design, a concept design, a preliminary design, the design for the construction permit, the design for the performance of works and the as-built design. The as-built design of a structure is created after the solar plant is completed for the purposes of obtaining the operation permit and maintenance (Kovacević and Lazarević, 2016, p. 106). The technical documentation which is

required for the construction permit is developed by a firm, another legal entity, or an entrepreneur who is listed in the relevant register of companies. Additionally, the design for the construction permit must undergo technical control (Kovacević and Lazarević, 2016, p. 106). After completing the technical control and receiving a favorable report on it, the application for the construction permit should be filed. A construction permit is then issued by the local municipality (for energy plants with capacities under 10 MW), the Ministry of Construction, Transportation and Infrastructure (for energy plants with a capacity of 10 MW and beyond), or the Autonomous Province of Vojvodina (for energy plants of 10 MW and beyond and entirely situated within the Autonomous Province's borders) – depending on the solar PV plant's capacity (Kovacević and Lazarević, 2016, p. 196; Wolf Theiss, 2022, p. 206). According to the so-called unified procedure, which is carried out online, a construction permit must be officially provided within five days (Wolf Theiss, 2022, p. 207).

The next step in the procedure is the obtaining of an operation permit, followed by an operation permit for the connection of the solar plant to the transmission and distribution system (Kovacević and Lazarević, 2016, p. 118). After acquiring the operation permit, the solar PV plant must be connected to the energy/electricity network and the procedure for that is defined in the Energy Law, as well as in the Decree on Conditions of Supply and Procurement of Electricity. The solar PV plant is connected to the transmission system based on the approval for connection, which is submitted to EMS after obtaining the construction permit (Kovacević and Lazarević, 2016, pp. 122–124). Finally, obtaining an energy license is an administrative procedure used to assess if the Energy Law's requirements have been met in order to operate an energy activity (Kovacević and Lazarević, 2016, p. 127). Therefore, an energy license is required to generate electricity and it is issued by the Energy Agency. It can only be granted to a Serbian legal entity and it is not transferable (Wolf Theiss, 2022, p. 196).

4 SWOT (Strengths, Weaknesses, Opportunities and Threats) and Strategic Planning Measures

The master thesis consists of two parts. The first part refers exclusively to literature research of academic journals, country reports of different international organizations and official national legislation in the energy sector in general, as well as in the field focused on electricity and renewable energies, in particular solar PV. This first part is important for a general understanding of how the development and construction of large-scale solar PV are proceeding administratively in each country so that then an important insight can be gained to draw conclusions and analysis in the course of the next chapter.

4.1 Research Design

In the second step, the various factors and policy recommendations for the SWOT analysis were also collected in the course of a detailed and extensive literature review. This data was finally categorized into the different factors of the SWOT. The data collection can be found in the Appendix and it is recommended to read through it, as not all factors could be integrated to the same extent. A more detailed explanation of the SWOT analysis and the different factors follows in the further subchapter. Furthermore, two expert interviews was conducted, as well as legal experts of the region provided me with valuable material. These helped to gain insights from different perspectives and opinions about large-scale solar PV authorization procedures in Kosovo, Albania and Serbia. These interviews served as a secondary source of information and has been partially included where appropriate. The transcripts of the interviews and the provided material and documents can be found in the Appendix and are recommended reading as they contain a wealth of information that could not be integrated within the scope of this paper. The interview partners and experts are briefly presented:

- Miloš Vučović, is a Senior Partner and Petar Mitrović, is a Partner at karanovic partners which is a legal firm covering regions and also specializing in the energy and natural resources field. This interview was focusing on the legal situation of Serbia and it was conducted on 15 May 2023.
- Anisa Rrumbullaku is a Partner at karanovic partners in Albanian practice. She is an expert on energy projects and she provided material on Albania on May 24, 2023. As well an interview was conducted on 26 May 2023.

- Driton Hyseni is a PV project developer. He provided material on Kosovo on May 24, 2023.

4.1.1 Basics about SWOT

The SWOT analysis is a typical technique for strategic analysis and it is used to comprehend the internal factors, strengths and weaknesses, as well as the external factors, opportunities and threats that the investor is facing. The examined components are matched with one another by synthesizing and generalizing all aspects of the internal and external contents, and a sequence of corresponding conclusions that have a particular decision-making character may be made from them (Weihrich, 1982; Wang *et al.*, 2021). A SWOT is part of an investor's internal analysis approach in order to undertake a thorough, methodical and accurate assessment of the circumstances in order to identify development strategies, plans and countermeasures. The following Figure 7 displays a typical SWOT analysis (Wang *et al.*, 2021, p. 4).

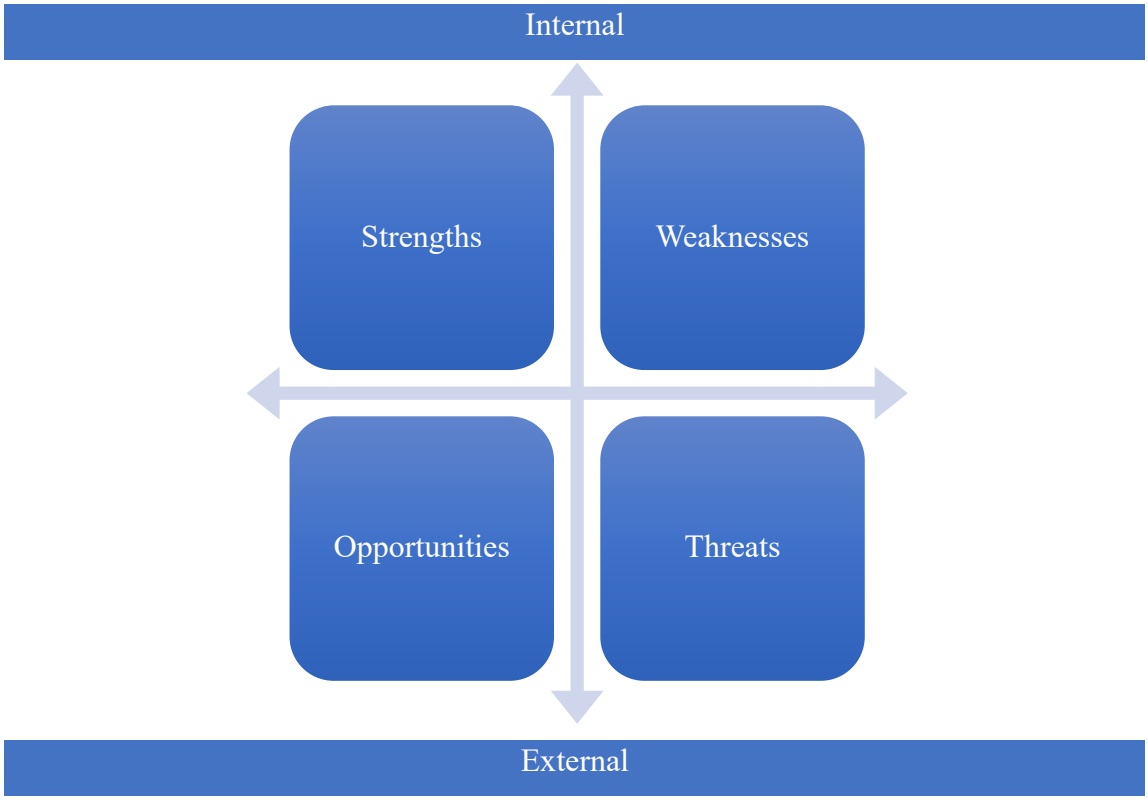

Figure 7 SWOT Analysis (Wang et al.*, 2021)*

An investor could conduct strategy evaluation, creation and selection with the use of the SWOT analysis which is a useful situational analysis technique. It may help an investor

develop a direction for the next activities by examining the internal factors, strengths and weaknesses, external factors, opportunities and threats (Wang *et al.*, 2021, pp. 4–5).

In recent years, academics have made a significant contribution to academia by conducting a thorough evaluation and analysis of the state of a region's energy development and progressively introducing the SWOT analysis technique to the energy sector (Wang *et al.*, 2021, p. 5). For instance, J. Terrados et al. used the SWOT analysis technique as a strategic planning tool to examine how the Jaén region in the south of Spain may change from an olive-based agricultural region to a renewable energy (solar PV power and biomass) elaboration region (Terrados *et al.*, 2007; Wang *et al.*, 2021, p. 5). In addition to that, particularly researchers have increasingly used the SWOT analysis technique in the sectors of wind power and solar PV power generation in the last four to five years. Another example would be the study by Chen Weiming et al. which performed a SWOT on Japan, South Korea and Taiwan in terms of renewable energy development in order to ensure their energy security and create a low-carbon economy highlighting an extra potential for renewable energy deployment (Chen *et al.*, 2014; Wang *et al.*, 2021, p. 5).

4.2 Data Collection and SWOT Analysis Modeling Procedure

Based on the work of Wang et al., a SWOT analysis framework was developed. Figure 8 depicts the modeling process for the four phases in the SWOT analysis (Wang *et al.*, 2021, p. 5). Step 1 was the creation of a general framework to establish the goal of this master thesis. The goal of this paper is to assess the SWOT analysis technique for the authorization procedure of large-scale solar PV construction and operation in Kosovo, Albania and Serbia. Step 2 involves the gathering of information from a literature review, official country websites, government legal papers, country reports from international organizations and institutions, provided documents from experts, as well as interviews with experts in order to list the project's strengths, weaknesses, opportunities and threats. Table 1 lists the primary questions raised in order to perform a SWOT analysis for each country individually.

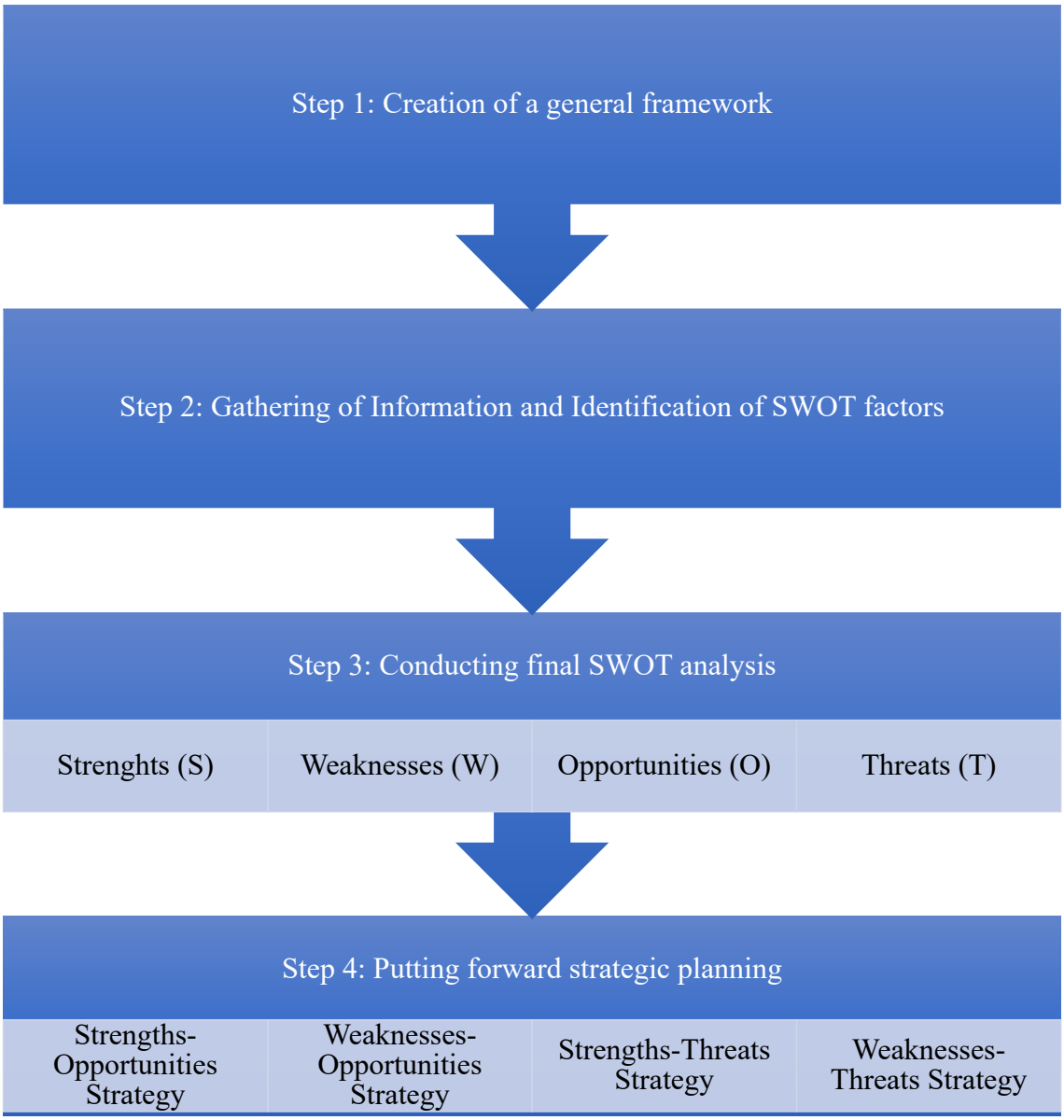

Figure 8 Modeling Process for SWOT (Wang et al.*, 2021)*

Table 1 Main Questions for the SWOT Analysis

Code	Question	Detailed Explanation
Q1	What are the strengths of the current permitting process for large-scale photovoltaic project?	What are the internal factors that are positive for the authorization procedure of large-scale PV for an investor?
Q2	What are the weaknesses of the current permitting process for large-scale photovoltaic project?	What are the internal factors that restrict the authorization procedure of large-scale PV for an investor?

Q3	What are the opportunities of the current permitting process for large-scale photovoltaic project?	What are the external factors that are positive for the authorization procedure of large-scale PV for an investor?
		How do you evaluate the government's policies?
Q4	What are the threats of the current permitting process for large-scale photovoltaic project?	What are the external factors that restrict the authorization procedure of large-scale PV for an investor?

5 SWOT and strategic planning measures

The SWOT analysis matrix is created using data from an extensive literature review, official country websites, government legal papers, country reports from international organizations and institutions, and interviews with experts. The collected data for each country and their references can be found in Appendix A.1 – A.3. For each country, a table is displayed which establishes the SWOT analysis for the authorization procedure to construct large-scale solar PV. A thorough review of these factors proceeds with a detailed discussion.

5.1 SWOT and Strategic Planning Measures for Kosovo

Table 2 SWOT Matrix Kosovo

SWOT Matrix Kosovo		Internal Factors	
		Strengths	**Weaknesses**
		- Effective and reliable transmission system, large capacity. - EBRD assistance and favorable support for investors - Strongly defined ambitions to increase the share of renewable energy. - Increasing solar PV output: increasing solar potential and considerable development.	- Absence of premium tariffs: impact on competitiveness and cost-effectiveness. - Administrative delays: long waiting times for authorization. - Special requirements for municipal approval to construct solar PV project. - Challenging financial environment: high interest rates and shortage of investment credits. - Extensive paperwork. - Lack of uniform municipal consent: different forms and processing times. - Duration limitation of PPAs.
External Factors	**Opportunities**	**Strengths-Opportunities Strategy**	**Weaknesses-Opportunities Strategy**
	- Anticipation for adoption of premium rates and competitive tenders. - Kosovo Credit Guarantee Fund was established for established to meet financing demand of investors. - First auction's announcement took place. - Loosen the preliminary authorization requirements in order to make it easier to be qualified to participate in auction processes. - ALPEX expansion into the Kosovo market. - Kosovo's government pursuing goals for decarbonization and renewable energy. - EBRD contribution to the development of auction frameworks.	- Strong transmission system and interconnection capacity. - Support from EBRD, USAID, and ALPEX. - Potential for premium rates and competitive tenders. - Kosovo Credit Guarantee Fund and green loans. - Opportunities through future auctions and ALPEX market. - Emphasis on decarbonization and renewable energy.	- Anticipated adoption of premium rates and competitive tenders. - Advocate for cost-effective and competitive support program. - Reduce delays in administrative and permitting procedures. - Simplify municipal approval processes and documentation requirements. - Establish a one-stop-shop system of permits and licenses for faster deployment of renewables.
	Threats	**Strengths-Threats Strategy**	**Weaknesses-Threats Strategy**
	- Potentially too ambitious and unrealistic renewable energy targets in Energy Strategy. - Lack of transparency and unsolicited projects in tender/auction processes.	- Remarkable transmission infrastructure and interconnection capacity. - Progress in raising RES share in energy mix. - Anticipated adoption of premium rates and competitive tenders. - Mitigating dangers of unsolicited projects through transparency and fair bidding procedure. - Leveraging strengths to address threats.	- Resolve weaknesses in support mechanisms and administrative procedures -ERO must step up. - Address unsolicited projects and lack of transparency. - Promote support mechanisms and transparency in bidding process.

The different factors (strengths, weaknesses, opportunities and threats) and mitigation strategies for Kosovo are presented and summarized in Table 2. In addition, the next subchapters will further outline the mitigation strategies.

For investors, the authorization procedure for the construction and operation of large-scale solar PV in Kosovo offers various advantages. First off and most crucial, is that Kosovo is equipped with a strong transmission infrastructure that is quite advanced and modern. Kosovo's transmission system is among the top three European countries in terms of interconnection capacity rations of installed production capacities and peak load. The present transmission capacity of interconnectors is expected to be more than sufficient to support the development of RES through 2030. In addition, investors' endeavors are frequently supported by the assistance and investment support of the EBRD and the prospects for market integration offered by ALPEX are also very advantageous. Generally, the percentage proportion of RES in Kosovo's energy mix has been rising gradually with Kosovo also successfully meeting its 25% of RES share goal in 2020 which was in line with the objective set by the Ministerial Council of the EC. Kosovo now has about 7 MW of solar capacity and further projects are in the planning, also more projects are waiting for approval, which is a strong indicator of an expanding market opportunity for solar PV investment in. According to statistics of IRENA; Kosovo offers a cost-competitive solar potential with high insolation levels that range between 1,400 and 1,500 kWh/m^2/year and are predicted to reach up to 600 MW by 2030 (International Renewable Energy Agency (IRENA), 2020).

However, there are also numerous weaknesses in Kosovo's procedure for authorizing large-scale PV projects that investors should be aware of. At the moment, the cost-effectiveness and competition of national assistance programs and FiTs are now significantly impacted by the absence of feed-in premium tariffs and competitive bidding processes. The three-year waiting time between preliminary and final authorizations results in delays and those administrative and permitting procedures delays represent a serious and major difficulty. Additionally, special criteria for municipal approval for solar PV projects present extra obstacles, since municipalities must produce permission forms verifying conformity with development and urban plans, causing needless delays and unfamiliarity with the process. Also, for DSO project approvals extensive documentation proof is needed, which increases this difficulty. Furthermore, the financial environment for

distributed PV projects is difficult due to high-interest rates and a shortage of investment credit. This situation forces investors to largely rely on their own equity due to this difficult financial climate. In general, there is a lack of consistency in municipal permission forms, procedure timelines and investment support, which results in errors and delays. Moreover, the length of PPAs is restricted by the RES operator's generation license and is only allowed for a maximum of 15 years if one is not necessary.

Kosovo's authorization procedure offers a lot of opportunities for investors aiming to construct large-scale solar PV. As Kosovo is a party to the EC Treaty, it is anticipated to progressively implement premium tariffs and competitive public tenders. The first auction has already been announced, simultaneously creating a platform for investment opportunities and companies now have access to financing opportunities, including so-called green loans that are offered by major banks and that have been created by the Kosovo Credit Guarantee Fund. Moreover, through revisions to the support scheme rule and the authorization procedure, the Kosovan government should use the opportunity to ease the conditions for the preliminary authorization due to high application demand. This would facilitate developers and investors to achieve eligibility for the auction procedure. Another important aspect regarding opportunities is ALPEX which has lately begun operating on a regular schedule and is soon to broaden its scope to include the Kosovo market. Kosovo is also strongly supported to reach its energy policy goal by the USAID. Also, the development of the auction idea for renewable energy has been greatly aided by EBRD. Both supports are still ongoing.

For investors, threats are also present in Kosovo's authorization for the development of large-scale solar PV projects. Based on current trends in RES generation, it is possible that the goals outlined in the Republic of Kosovo's Energy Strategy, such as the target of at least 25% of gross final energy consumption for the years 2020-2023 are not realistic and reachable. A major risk are unsolicited projects and a lack of transparency in the auction processes which can damage the investor's confidence and deter competent project sponsors from taking part. Those issues must be resolved to create a more welcoming investment climate.

5.1.1 Strengths-Opportunities Strategy

An investor can take advantage of the promising strengths for the development of large-scale solar PV projects in Kosovo. Large-scale solar PV projects benefit from a strong foundation as Kosovo is ranked as one of the top three European countries in terms of its highly developed transmission system and interconnection capacity. Furthermore, the support provided by EBRD, USAID and the availability of ALPEX provides new alternatives for financing, market involvement and project development. In addition, thanks to the EC Treaty, investors have a potential path forward regarding a progressive implementation of premium rates and competitive public tenders. Related to that, the development of the Kosovo Credit Guarantee Fund and the accessibility to green loans through national major banks make it simpler to obtain funding for large-scale solar PV construction. Such funds are very important for enhancing financing opportunities for renewable energy projects. Additional prospects for market entrance and project development are presented by the future auctions and by ALPEX's endeavors to include Kosovo in the market. Finally, Kosovo's emphasis on decarbonization and renewable energy, which is backed by USAID, matches up with the investors' goals of promoting the usage of RES and energy security.

5.1.2 Strengths-Threats Strategy

An investor can capitalize on the advantages and strengths in order to manage the difficulties and threats related to Kosovo's authorization procedure for the construction of large-scale solar PV. Despite existing threats and possible challenges, Kosovo has a remarkable transmission infrastructure at its disposal and its strong ranking in Europe in terms of interconnection capacity presents a strong basis. Investors' concerns about the challenging goals outlined in the Energy Strategy can be alleviated by highlighting the progress made in raising the share of RES in the nation's energy mix and using the EBRD's assistance. This would be a call for the Kosovan government to amend the energy strategy to include even more clear policies for the energy transition, RES, in particular for solar PV and to ensure compliance with EU directives. It is critical for Kosovo to actively engage in the expected adoption of premium rates and competitive public tenders in order to overcome the shortcomings caused by an absence of feed-in premium tariffs and delays in administrative processes. The dangers posed by unsolicited projects can be mitigated by transparency and adherence to a fair bidding procedure, which also helps to win over investors and secure reliable project sponsors. As a whole, the investor may

better manage the authorization procedure by exploiting current strengths and actively addressing threats.

5.1.3 Weaknesses-Opportunities Strategy

Although Kosovo's authorization procedure for the construction and development of large-scale solar PV comes with weaknesses, there are still prospects for investors to profit from. For instance, it is envisaged that premium rates and competitive public tenders would gradually replace the lack of feed-in premium tariffs and competitive processes. In this regard, an investor himself should advocate for a more cost-effective and competitive national support program that would guarantee fair market access and increased cost-effectiveness. By active participation in the change of rules to shorten the period between preliminary and final authorization, or to eliminate the preliminary authorization as a whole, the difficulties relating to delays in administrative and permitting procedures could be reduced. The creation and establishment of a one-stop-shop system of permits and licenses would present a great opportunity for faster deployment of renewables. The creation of the Kosovo Credit Guarantee Fund and the availability of green loans provide funding alternatives and enable the investor to manage financial threats imposed by high-interest rates and a lack of investment loans. Additionally, Kosovo should engage more in standardized municipal approval processes and simplify the documentation requirements, so that an investor could navigate easily through the required documents and processing timeframes. Furthermore, Kosovo should look into alternate ways to connect to the DSO grid and appeal for fewer technical constraints as this can assist in cutting costs and speeding up project approvals. By taking advantage of these opportunities, the investor's chances of constructing large-scale solar PV in Kosovo can be improved.

5.1.4 Weaknesses-Threats Strategy

Generally speaking, the authorization procedure for the construction of large-scale solar PV is not without weaknesses and imposed threats. To reduce possible hazards, issues such as the lack of particular support mechanisms or administrative procedure delays must be resolved. Additionally, uninvited projects and a lack of transparency in the bidding process could undermine investor confidence and deter credible sponsors. Weaknesses must be proactively addressed in order to combat these threats. Investors may

lessen threats and foster a more favorable climate for large-scale solar PV projects by promoting the use of support mechanisms and maintaining transparency in the bidding process.

5.2 SWOT and Strategic Planning Measures for Albania

Table 3 SWOT Matrix Albania

SWOT Matrix Albania		Internal Factors	
		Strengths	**Weaknesses**
		- Solar resources with great potential for development. - Albania achieved its 2020 renewables goals. - EBRD support and investment in renewable energy projects. - Implementation of auctions for renewable energy. - Energy prices attract local and foreign investors. - Incentives like Power Purchase Agreements and Feed-in Tariffs drive sustainable projects. - Proposed incentives for priority grid access and VAT exemptions. - Strong interest in applications for wind and solar projects.	- Heavily dependent on expensive fossil fuel imports and seasonally available hydropower. - Public policy and the legal system are frequently reviewed, which raises questions. - Assessment and approval of private investor offers for solar projects are challenged by limited storage and grid capacity. - Evaluation process for private project proposals may lead to uncertainty. - Lack of proper zoning for solar PV and wind projects. - Outdated transmission and grid infrastructure.
External Factors	**Opportunities**	**Strengths-Opportunities Strategy**	**Weaknesses-Opportunities Strategy**
	- EU's Economic and Investment Plan for the Western Balkans supports the development of foreign investment in the energy sector. - Large-scale PV projects can receive subsidies in Albania. - Albanian legislation will be harmonized and brought closer to EU norms. - Due to high electricity prices, there is room for private investment in the Albanian market. - Competitive support schemes enhance planning and regulations. - ALPEX day-ahead market improves electricity wholesale markets.	- Taking advantage of the feed-in tariff mechanism to ensure a market for solar energy. - Profit from Albania's solar energy potential. - Participation in auctions and tenders for renewable energy. - Improved wholesale power markets can be achieved by using ALPEX integration. - Take advantage of the EU standards' convergence to bring in foreign investment. - Promote PV projects as being in compliance with EU laws.	- Reduce reliance on hydropower and invest in solar and wind energy to diversify energy sources. - Improvement of grid storage and infrastructure. - Make storage technology research a priority: Make sure the energy supply is uninterrupted and reliable. - The ALPEX day-ahead market will improve wholesale electricity markets and integration with Kosovo by fostering market integration and efficiency.
	Threats	**Strengths-Threats Strategy**	**Weaknesses-Threats Strategy**
	- Heavy reliance on seasonal hydropower; costly imports of fossil-based energy. - Lack of public comprehension of the financial feasibility and benefits of renewable technology. - Inadequate implementation of obligations from the EU Environmental Liability Directive. - Investors must be informed about governmental policy changes and institutional energy sector efforts.	- Ensure an easy transition to support programs that are competitive. - Improve acceptability by removing the idea of upfront investment. - Intensify cooperation with institutional investors like the EBRD. - Albanian legislation should be updated to reflect the Environmental Liability Directive.	- Create a predictable environment for investments in energy by establishing sound laws and regulations. - Enhance grid infrastructure and storage to accommodate the rising supply of renewable energy. - Speed up the assessment of solar and wind energy projects: Improve investment by evaluating projects more quickly. - EU Environmental Liability Directive incorporation: Ensure environmental protection and compliance.

The different factors (strengths, weaknesses, opportunities and threats) and mitigation strategies for Albania are presented and summarized in Table 3. In addition, the next subchapters will further outline the mitigation strategies.

Albania is an attractive region for the development of solar PV systems on a big scale due to a number of its advantages. A favorable regulatory environment is produced by the presence of FiTs and the requirement that public utilities purchase power from renewable sources. With 240–300 sunny days and 2,400 hours of sunlight on average per year, Albania has a substantial solar energy potential that presents a secure and ecologically beneficial alternative. Albania has proven its dedication to renewable energy by fulfilling its 2020 target for renewables and conducting profitable auctions for projects utilizing renewable energy. Prices for energy and incentives, such PPAs and VAT exemptions, have drawn both domestic and foreign investors, promoting RES expansion.

Albania's strong reliance on seasonal hydropower, which is unable to fulfill the nation's rising energy needs and necessitates expensive fossil-based energy imports during times of low river flow, is one of the country's investor-relevant limitations for the development of large-scale solar PV. Due to decreased rainfall as a result of climate change, hydropower generation is increasingly threatened. In a developing country, frequent modifications to the public policy and legal framework generate worries and could result in uncertainty. For solar and wind projects, the limited storage and grid capacity provide difficulties. Standards for acceptability and viability are questioned by the review procedure for private project proposals. The identification of high-potential locations is hampered by the improper zoning of solar and wind installations. Additionally, with high amounts of renewable energy, outdated transmission and grid infrastructure could not guarantee safety. These weaknesses underscore the necessity of careful thought and strategic planning for investors in Albania's solar PV market.

The existing projects with EU support and collaboration that provide the possibility for additional investments in renewable energy are among the opportunities for constructing large-scale solar PV in Albania. The development of renewable energy projects is made simpler by streamlined authorization procedures and the utilization of a national electronic registry. Large-scale PV development in Albania is supported by subsidies

obtained through tenders. Albania's legislation now complies with EU norms, which opens the door to easier market integration and more international investment. The Albanian market has high power prices, which offers great possibilities for private investment. The switch to competitive support schemes enhances the regulatory and planning frameworks for renewable energy projects. The creation of the ALPEX day-ahead market improves the wholesale markets for electricity in Albania and Kosovo, leading to higher levels of market efficiency. These factors support Albania's favorable investment opportunities for large-scale solar PV.

Albania faces threats due to its strong reliance on seasonal hydropower, which is unable to fulfill the country's rising energy needs and forces expensive fossil fuel imports. Additionally, it is critical to remove financial obstacles and increase public understanding of the advantages and practicality of renewable technology. EU Environmental Liability Directive rules have not yet been incorporated into Albanian legislation. Greater solar capacity is required due to the low generation of solar energy and widespread resistance to hydropower plants. Investors should be informed of governmental policy changes and institutional activities. Project development is threatened by the transition to competitive support programs and the unpredictable nature of the planning procedure. While the ALPEX in operation improves the wholesale markets for energy, its earlier delay would have impeded market integration.

5.2.1 Strengths-Opportunities Strategy

An investor should take advantage of the existing FiT system that promotes support for renewable energy in Albania and focus on developing PV projects with an installed energy capacity of more than 2 MW to qualify for the tariff. Also, the obligation of public utilities to purchase electricity from renewable sources should be exploited to create a guaranteed market for PV electricity. Similarly, Albania offers abundant solar energy potential with an average annual sunshine duration of 2,400 hours and 240-300 bright days. The estimated annual solar energy production potential of 1,500-1,700 kWh/m2 underlines the viability of PV for electricity generation in Albania. Albania also offers attractive government support and international investment, including the financial incentives offered by the EU Economic and Investment Plan for the Western Balkans, as well as opportunities to work with international financial organizations such as the EBRD to access funding and technical assistance. Albania is also one of the pioneers when it comes to

renewable energy auctions and tenders, which are also supported by the EBRD and the EC Secretariat. Another attraction is the inclusion in the day-ahead market of ALPEX to improve wholesale electricity markets and ensure greater market efficiency. Finally, convergence with EU standards is a major benefit. It can be benefited from the alignment and convergence of Albanian laws and regulations with EU standards. This trend facilitates integration with European markets and attracts foreign investment. Position PV projects as compliant with EU regulations to increase their attractiveness to investors and potential buyers.

5.2.2 Strengths-Threats Strategy

Albania can develop a resilient renewable energy economy by addressing the threats it has identified and leveraging its strengths to overcome current obstacles and assure sustainable growth.

The government should give priority to the development of solar and wind power projects and diversify energy sources in order to lessen Albania's excessive reliance on hydropower. The enormous potential of these energy sources is a result of Albania's long summers and the necessity to diversify energy sources. A favorable legal environment is also created through FiTs and the need that public utilities to buy power from renewable sources. To eliminate unpredictability in the planning and regulatory process, the government should ensure a smooth transition to competitive support schemes and accelerate the replacement of the existing renewable energy law. Clarity and stability for project development would result from this. Additionally, government-sponsored education programs should be run to educate the general population on the benefits of renewable energy for both people and the country as a whole. As a result, the possibility of major upfront investment expenses will be eliminated, and the public's acceptance will increase. Maintaining cooperation with international institutions like the EC Secretariat and the EBRD is also important to benefit from their knowledge, investment, and technical support. To encourage the development of sustainable infrastructure and draw in new private investment, intensify cooperation with institutional investors like the EBRD. To increase environmental protection and sustainability, the Environmental Liability Directive's criteria must be incorporated into Albanian legislation.

5.2.3 Weaknesses-Opportunities Strategy

Albania can make the transition to a more sustainable and diversified energy industry that attracts investment and assures a reliable and inexpensive energy supply in order to solve deficiencies and capture possibilities. This entails a few crucial tactical actions. Diversifying energy sources would be the first step. By diversifying the energy mix, including greater investment in alternative RES like solar and wind, as well as investigating solutions for energy storage, the state and its citizens must be aware of lowering their reliance on hydropower. The second is to enhance the legal and policy foundations. It is vital to have a stable and predictable policy and regulatory environment in order to offer certainty and draw investment to the energy industry. The development of grid infrastructure and storage capability is a crucial next step because it enables investments in transmission and grid infrastructure that can accommodate the increased capacity of RES. In order to provide an uninterrupted and consistent energy supply, storage technology research must also be prioritized. Promoting market integration and efficiency is also crucial. To enhance wholesale power markets, encourage more efficiency, and foster integration between Albania and other nations like Kosovo, the ALPEX day-ahead market was established.

5.2.4 Weaknesses-Threats Strategy

Albania can encourage a more resilient and sustainable energy sector while maximizing opportunities for the growth of RES and luring investment by addressing its weaknesses and countering its threats.

In order to create a predictable and beneficial environment for energy investments, this weaknesses-threats strategy advocates for the establishment of solid rules and regulations. Additionally, as was already said, storage and grid infrastructure have to be improved in order to accommodate the growing renewable energy supply. Also, accelerating the evaluation of solar and wind energy projects is a crucial additional step to attracting investment. Last but not least, the EU Environmental Liability Directive's incorporation and maintaining environmental compliance are further crucial steps.

5.3 SWOT and Strategic Planning Measures for Serbia

Table 4 SWOT Matrix Serbia

SWOT Matrix Serbia		Internal Factors	
		Strengths	**Weaknesses**
		- Continuous improvement of legal system and efficient government processes. - Construction permit process is sped up by the Online Unified Procedure. - RES Law drives the MME' digitalization. - General grow in interest in Serbian renewable energy projects. - Auctions supported by EBRD foster renewable growth. - Quick approval with a competent local team (2 years), faster than in an EU country.	- Formal judicial system, apostille and notarization required. - Long licensing procedure with a lot of documentation requirements. - Limited improvement in the efficiency of administrative procedures. - Legal uncertainty and capacity shortage in government agencies. - Historical underdevelopment with only 20 MW of solar capacity. - Uncertainty whether a panel is viewed as movable or immovable.
External Factors	**Opportunities**	**Strengths-Opportunities Strategy**	**Weaknesses-Opportunities Strategy**
	- Implementation of renewable energy auctions and approve pending bylaws (such as balancing responsibility). - Further anticipation of incentive programs. - Environmental commitment and reliance on coal-fired power plants. - Shift from unprofitable FiT to more affordable and streamlined solar development. - Room for market expansion in the solar energy sector due to historically low development.	- Serbia's enhancement of electronic government procedures and digitalization and streamlining approval process through the online Unified Procedure portal - Utilize growing interest of international investors in Serbian renewable projects. - Foster the transition to EBRD-supported competitive auctions model. - Legal determination of importance of distinguishing whether solar panels are immovable and movable	- Serbia's commitment to environmental protection and desire for EU membership creates potential for solar PV growth. - One single administrative body for paperwork. - Implementation of new support schemes and bylaws (such as auctions and balancing responsibility). - Efforts to reduce emissions from coal-fired power plants and promote renewable sources, including solar energy. - Need to stimulate interest in solar energy investment by addressing weaknesses and potential consequences of energy transition failure.
	Threats	**Strengths-Threats Strategy**	**Weaknesses-Threats Strategy**
	- Violations and non-compliance in the implementation of the EIA Directive. - Contracts with grid operators are frequently non-negotiable, restricting flexibility for project developers. - Serbia's non-EU membership and risk profile may have an influence on credit ratings and funding options. - Grid congestion and inadequate infrastructure pose challenges to renewable energy projects. - Necessity for storage systems increase project costs and complicates financing. - Serbia's opposition to floating fees and its various methods for obtaining security.	- The predominance of coal-fired power plants as a problem should evoke to place a focus on the advantages of using renewable energy and the environment. - Stronger implementation of the EIA Directive. - Stronger addressment of grid congestion and inadequate infrastructure with grid storage solutions. - Investigate alternate financing possibilities for risks associated with non-EU membership. - Create alternate funding strategies for alternative of the floating fee concept.	- Implementation of EIA Directive is crucial for solar projects. - Grid congestion and storage systems pose cost and financing challenges. - Creation and framework of storage system is needed. - Non-EU status affects creditworthiness and requires exploring financing options. - Address negotiation challenges due to the absence of a floating fee concept.

The different factors (strengths, weaknesses, opportunities and threats) and mitigation strategies for Serbia are presented and summarized in Table 4. In addition, the next sub-chapters will further outline the mitigation strategies.

The strengths and advantages of investing in large-scale solar PV installations in Serbia are numerous. Serbia has been consistently modernizing its legal system and introducing digital government operations resulting in more efficiency of administrative processes. The Serbian Business Registers Agency's launch of the online Unified Procedure site drastically decreased the amount of time needed to decide on building permits, with over 13,000 permit applications being decided on in an average of only 10 days between 2016 and 2018. Serbia has also drawn the attention and interest of international investors in solar projects, suggesting a favorable investment climate. The adoption of the concept of the competitive auction, which is backed by EBRD, is also anticipated to help Serbia's renewable energy project growth. With a competent local staff, Serbia's licensing process moves more quickly than other countries in the EU, taking about two years to complete. As a result, for investors looking for a favorable investment environment and possible profits, large-scale solar PV in Serbia represents an attractive opportunity.

However, there are also several weaknesses regarding investment in large-scale solar PV projects in Serbia that investors should take into account. For instance, the legal system in Serbia is still very formal requiring apostilles and paper notarization for documents. This increases the complexity and prolongs the procedures in general. In addition to that, the EC also observed a lack of progress in reducing administrative procedures. Other factors that cause delays include the lack of a single administrative body and the lengthy licensing processes. Furthermore, there is insufficient legal certainty on government commitments, as well as a lack of capacity in government bodies. Another weakness is that with just about 20 MW of solar capacity built between 2009 and 2021, Serbia has historically had little solar power development. Finally, confusion is introduced by the legal distinction between solar power plants' moveable and immovable property. Due to these weaknesses, investors must carefully handle the technicalities and possible difficulties connected to large-scale solar PV projects in Serbia.

Serbia offers a number of opportunities for investors interested in large-scale solar PV projects. For instance, a supportive environment for the growth of solar energy would be

created through the implementation of renewable energy auctions and the adoption of pending laws, such as balancing responsibility. Furthermore, given the recent poor exploitation of solar energy, investors await additional support schemes from the Serbian government. As a result of Serbia's desire to join the EU and candidate status, and its dedication to environmental preservation, renewable energy initiatives have the potential to flourish in Serbia. Reducing emissions from large combustion facilities is still a top goal because coal-fired power plants still account for the majority of the energy mix. The attraction of solar projects has grown as a result of their accessibility and comparatively fast regulatory and construction processes, providing a promising opportunity for expansion. Despite Serbia's historically low level of solar power production, there is tremendous space for growth and market saturation, making now an ideal moment for investors to participate in the nation's solar PV business.

Finally, the authorization procedure for the development of large-scale solar PV is not without threats to investors. The first major threat presented is that Serbia still generates 70% of its electricity from coal-fired power plants, making it challenging to accomplish environmental targets and presenting a barrier to the expansion of solar energy. To guarantee effective EIAs, issues concerning failure in complying with the EIA Directive must be tackled. The necessity to get appropriate approvals and real property rights from grid operators for establishing connecting infrastructure might restrict the project developer's flexibility, as agreements with grid operators are frequently non-negotiable. Furthermore, investors' credit ratings and funding possibilities may be impacted by Serbia's non-EU membership and higher risk profile. Inadequate grid infrastructure and system congestion provide obstacles to renewable energy projects, particularly grid storage. The need to construct storage systems in order to link to the transmission system could drive up project costs and make financing more difficult. Moreover, due to Serbia's rejection of the floating fee concept, project finance discussions may also become more complicated, demanding alternative mitigating methods like pledging the panels and creating a mortgage. These threats draw attention to the difficulties and potential problems that investors should think about before contributing to large-scale solar PV projects in Serbia.

5.3.1 Strengths-Opportunities Strategy

The ongoing improvements to Serbia's regulatory framework and use of electronic government processes provide a conducive environment for project growth. The time needed

to make decisions on construction permits has been greatly decreased thanks to the online Unified Procedure site of the Serbian Business Registers Agency, enabling a quick authorization procedure for solar energy projects. A further factor that will promote the continuing expansion of renewable energy projects is the shift to the competitive auctions model, also partly sponsored by the EBRD. This type of support scheme model enables fair competition and guarantees opportunities, which will benefit solar PV investments in Serbia. Additionally, Serbia should legally determine the distinction between the definition of solar panels and whether to consider them as moveable and immovable solar which is essential for choosing the right security measures and funding projects. A competent local team in Serbia can complete the authorization procedure within two years, which is rather fast compared to the procedures in EU countries. With less time-related risk and quicker project implementation, this accelerated method enables someone to take advantage of the market's potential without suffering unnecessary delays. By taking advantage of these opportunities, it is possible to establish a strong position in the Serbian solar PV field and achieve long-term success as an investor.

5.3.2 Strengths-Threats Strategy

One major challenge for Serbia is the fact that coal-fired power plants still dominate Serbia's electricity generation and the government has to address this issue by emphasizing the environmental benefits and opportunities for renewable energy development. In addition, the government has to significantly advocate more for the implementation of the EIA Directive to ensure compliance and address potential breaches in the permitting process. Close work with grid operators is required to secure necessary permissions and real property rights, despite the limitations of non-negotiable contracts, to facilitate the construction of connection infrastructure. Regarding the financial aspect for an investor, alternative funding options and strategies should be explored as Serbia’s non-EU membership has an impact and creates a higher risk profile on credit ratings and financing choices. In addition, alternative financing approaches, such as pledging solar panels and creating mortgages should be developed in order to overcome the absence of a floating fee concept in Serbia. Finally, the Serbian government has to pay closer attention and engage more in addressing the grid congestion and inadequate grid infrastructure by considering grid storage solutions which also come with potential cost increases and financing challenges.

5.3.3 Weaknesses-Opportunities Strategy

The dedication of Serbia to environmental protection, especially in light of its desire to join the EU, creates the potential for the growth of RES like solar PV. Serbia should engage in aligning its environmental protection commitments and leverage the push toward EU membership to promote renewable energy development. In terms of legal work, the government of Serbia should advocate for reforms to streamline the licensing procedures and establish one single administrative body so that the need for excessive paperwork and requests that prolong the process can be reduced. In addition, if the government implements the much-anticipated new support schemes and bylaws, such as auctions and the bylaw on balancing responsibility, a great opportunity to expand the solar PV investment interest could be created. Serbia's power sector is still mainly dependent on coal-fired power plants, yet the state is very committed to reducing emissions from large combustion plants. In this regard, efforts should be made to develop electricity from more renewable sources and to make solar energy attractive, which is becoming increasingly popular and more affordable. Historical development shows that the opportunity for market growth was very low. However, there is still a need to stimulate more interest in investing in solar energy by highlighting the country’s weaknesses and the consequences of a potential energy transition failure.

5.3.4 Weaknesses-Threats Strategy

Serbia's persistent reliance on coal-fired power plants, which provide around 70% of the nation's electricity, makes it difficult to meet environmental objectives and make a transition to RES. A transition to more environmentally friendly energy sources can only be achieved with a phase-out of coal and with more commitment to promote the benefits of PV. Furthermore, Serbia's failure to fully implement the EIA Directive poses a risk and could potentially jeopardize the progress of any solar project. To ensure that relevant environmental assessments are carried out in a transparent and effective manner, it is critical to closely monitor the development of draft revisions and possibly participate in the consultation process as an investor yourself.

In addition, contracts with grid operators restrict project developers' decision-making power since they frequently contain non-negotiable templates. Options for project funding may be impacted by this. To align expectations and identify potential solutions to this issue, it is critical to have early and open communication with grid operators. It is possible

to assure efficient grid integration and reduce potential obstacles by establishing solid relationships with grid operators and searching out mutually beneficial arrangements. Another difficulty to solve is grid congestion and the need to build storage systems to support renewable energy projects. These difficulties can drive up project costs and make financing difficult. A law and framework for the storage of generated energy and for energy storage providers should be established so that further improvement of the grid infrastructure can be achieved. Also, Serbia's grid infrastructure may not be sufficiently ready to handle the anticipated overflow of renewable energy projects. It is essential to work together with grid operators, governmental organizations, and other stakeholders to create grid storage solutions and update the grid infrastructure in order to solve this.

In addition, it is important to carefully analyze how Serbia's non-EU status and higher risk profile may affect creditworthiness and financing options. To ensure that sufficient funding is available for PV projects, it is critical to collaborate with financial institutions and explore other financing options. Finally, special thought should be given to the possible difficulties in negotiating project finance caused by the lack of a floating fee concept and the necessity of pledging panels and constructing mortgages.

5.4 Discussion

The strategies mentioned in the previous chapter will now be discussed in a combined approach and the countries are analyzed individually in this chapter in order to find and draw the best means and mitigation strategies for an investor.

The first result mentions Kosovo and provides a summary, as well as ideas and examples. It can be concluded that from the investor's point of view, the procedure for a PV project in Kosovo is very burdensome and involves a lot of bureaucracy. The lack of coordination between the fundamental and secondary legislation, as well as the administrative directives of the several ministries, is especially obvious in renewable energy projects. Additionally, the absence of a one-stop shop makes it more difficult for investors to carry out their requirements. It might be challenging for investors to incorporate their renewable energy projects in the zoning map, for instance, because municipal development plans are only revised every four years. This requires extensive work and lengthy procedures for the necessary revisions. It can be seen that, in particular, policymakers and administrators are unwilling to fully promote RES, focusing on supporting coal-fired power plants. As a result, Kosovo is falling short of meeting its targets for renewable energy in the transport sector and the electricity sector. The business community faces a variety of obstacles, from a lack of ambitious RES initiatives to particular issues with governmental institutions. Another significant issue that hinders the uptake of renewables and lessens the attraction to investors is finding finance for renewable energy projects. Kosovo must start a genuine transition to RES and create an ambitious long-term plan for its implementation in order to address these issues. This suboptimal situation is nevertheless a call to, as well as an excellent opportunity for, the government to demonstrate its willingness to overcome obstacles to foreign and domestic investment in the approval procedure. One crucial measure is the establishment of a one-stop store, which would streamline procedures and make them more attractive to foreign investors. In addition, harmonization of renewable energy legislation in line with Kosovo's energy strategy is essential, as well as further harmonization with EU Directives. By implementing legislative changes and aligning administrative directives, the government can simplify the process, make it more attractive to foreign investment, and achieve its renewable energy targets. However, it is important to address the potential risk of insufficient oversight of the authorization procedure for renewable energy projects, which could lead to grid congestion.

In an effort to attract private investors, Kosovo recently announced its first auctions, launching one for a 30-year concession contract to build and operate a 100 MW PV plant on a public site in Rahovec. The government is offering several benefits to potential investors, including the designation of a suitable development site, a guaranteed purchase price and simplified administrative procedures. The winning bidder will enter into a 15-year PPA and lease the designated area in Rahovec, in southwestern Kosovo, for the duration of the concession. The project is expected to be completed within two years of signing the contract. It can be concluded that Kosovo is an attractive country for an investor, due to its robust transmission infrastructure and interconnection capacity, ranking among the top three European countries in these aspects, as well as due to an active international participation, such as the EBRD and USAID. However, a lot of administrative and legal reform and renovation is still needed, as well as a further engagement when it comes to financial support schemes (personal communication with Ditron Hyseni, 2023).

The second result mentions Albania. The Albanian authorization procedure for large-scale solar PV projects is difficult from an investor's point of view in a number of ways. Insufficient zoning for PV and wind energy projects is one of them, making it challenging to choose sites with a high potential for energy development in terms of technological, economic, and land-use practicality. In addition, when there are significant volumes of renewable energy involved, the outdated transmission and grid infrastructure poses security issues. Albania's planning and regulatory procedures are also unpredictable as a result of the country's switch to support schemes with open competition. The present renewable energy law from 2017 is being replaced with a new law, which adds more ambiguity and uncertainty for foreign investors because it is not yet available in English. The uncertainty is also exacerbated by the fact that ALPEX, a day-ahead market created to link the wholesale power markets of Albania and Kosovo, is not yet completely operating. The lack of competent workers for the new technologies and renewable technologies is another issue. Albania ranks among the nations in Europe with the most sunshine hours per year, yet the country mainly relies on hydropower to generate electricity, making it susceptible to changes in rainfall and necessitating significant (fossil) electricity imports. The government is putting policies in place to expand the nation's solar and wind resources and diversify the nation's energy sources in order to combat this. Competitive energy rates, which draw both domestic and foreign private investors, are the foundation of Albania's renewable energy sector's attractiveness. PPAs and FiTs, which can be transformed into

CfD once the day-ahead market is operational, have piqued the interest of renowned energy businesses like Voltalia and assisted in the promotion of larger, more sustainable projects. Guaranteed priority grid access and the intended (if realized) VAT exemption for imported machinery and equipment for solar and wind projects are further incentives that support the sector's expansion. The large number of applications for wind and solar power projects, including those without government subsidies, suggests good conditions for the industry's future growth. The development of the industry will also be aided by self-generating RES. Self-generators, designated as end users with installations under 500 kW, are permitted to produce, consume, store, and sell surplus renewable energy, in accordance with the new draft law on renewable energy. They will be able to take advantage of a net billing-based balancing scheme and get paid for the electricity their plants produce at a rate that has been approved by the ERE (personal communication with Anisa Rrumbullaku (karanovic partners), 2023).

The third, and last result mentions Serbia. From the standpoint of an investor, Serbia's approval process for large-scale solar PV projects has encountered historical difficulties. Only about 20 MW of solar capacity has been constructed in the previous 12 to 13 years, mostly because larger projects cannot be supported financially by the FiT, which is intended for smaller plants. The situation has now altered, and solar is currently gaining popularity because of its affordability and somewhat quick authorization and construction processes, providing a promising future for solar development in Serbia. When it comes to permits, Serbia typically moves more quickly than the EU, especially if having a capable local team that is aware of the regional procedures. If all permissions are in order, it should take this team about two years to execute a project from conception to construction. Still, the requirement to install storage systems for grid connection is a challenge for new projects, increasing capital expenditure (CAPEX) and raising concerns about financing. This need for a storage system is relatively new, and its effects are not yet fully known. The grid's congestion is one of the new projects' biggest weaknesses. Similar to the rest of Europe, Serbia's grid infrastructure is not adequately developed to handle the anticipated volume of renewable energy required to achieve the green transition targets by 2030. Due to Serbia's non-EU status, it has a higher risk profile than the rest of Europe, which may affect investors' credit ratings and their ability to obtain financing or off-take agreements with local suppliers or customers. The capability of governmental organizations and institutions may also be inadequate, particularly when a greater volume of

requests is made. Despite progress, there is still some doubt about the stability of the legal system because recent changes to the Law on Renewables have been significant and quick. This contradiction creates a considerable barrier. However, there are prospects for investors, especially when they are assisted by competent local staff. With such a team, the procedure may move along quite quickly and provide a level of confidence that is adequate. In order to keep the intended pace of the energy transition, it could be necessary to reconsider the responsibility to build storage systems. In conclusion, despite ongoing difficulties like grid congestion and legal ambiguity, Serbia presents prospects for investors, especially with the appropriate local team and the capacity to understand the many land alternatives (personal communication with Miloš Vučković and personal communication with Petar Mitrović, 2023).

6 Conclusion

6.1 Summary of the Main Findings

The Western Balkan region and its proximity geographically, as well as its close relations with the EU, have piqued my interest in the untapped potential of solar systems in Kosovo, Albania and Serbia. The countries of the Western Balkans face great challenges in terms of energy intensity, energy transition and exploiting the potential of RES. Renewable energy generation from sources such as hydro, wind, biomass, and geothermal represents significant untapped potential in these regions. However, a number of obstacles, including political, technological, financial, legal, and educational, as well as the fact that none of the three countries is a member of the EU, hinder the examination and exploitation of this potential. Nevertheless, all three countries are making efforts to adopt EU directives through their national legislatures. This master's thesis examines the early stages of implementation, which are of equal personal interest to me. In particular, I was interested in examining the permitting procedures for PV systems and the strengths and weaknesses of the legal systems in the three countries, and then using this information to develop strategies that can be used as a mitigation, but also as recommendations, both for an investor and for the countries themselves.

The study conducts a thorough SWOT (strengths, weaknesses, opportunities, and threats) analysis of the authorization procedures in Kosovo, Albania, and Serbia. The SWOT analysis provides a deep insight into the current (legal) state of photovoltaic development and the goal is to identify opportunities for improvement using four strategies (Strengths-Opportunities, Strengths-Threats, Weaknesses-Opportunities, Weaknesses-Threats). This study aims to provide insightful analysis and suggestions for investors and policymakers in the Western Balkans region to promote the growth and success of large-scale PV projects by bridging the gap between academic research and practical application.

Resulting from the relevance of this topic and the different authorization procedures in Kosovo, Albania and Serbia, this thesis has the following research questions:

What is the procedure for the authorization of large-scale solar PV projects in Kosovo, Albania, and Serbia?

What are the strengths and weaknesses of these authorization procedures?

What opportunities and threats do these authorization procedures present?

Based on the findings related to the questions above, comes an additional question:

What strategic planning measures, mitigation strategies, and recommendations can be formulated for potential investors?

The first research question is answered by means of an extensive literature review. The literature review first examines in detail what exactly is understood by large-scale solar PV in the different three countries. This is followed by research on the international legal framework relevant to the Western Balkans region, with special reference to the EC. This is continued with an individual analysis of authorization in the three countries, taking into account the national RES contribution and policies, national legislation, the different stakeholders, as well as the procedures and their steps.

The renewable energy sectors in Kosovo, Albania, and Serbia are confronted with difficulties that hinder investment and sustainable development in various ways, some of which harm them individually and others of which affect them collectively. From the standpoint of an investor, Kosovo's solar project approval procedures are complicated, bureaucratic, and uncoordinated, and the examination of land use plans takes a long time. Initiatives involving renewable energy are made more difficult by the policymakers' emphasis on coal-fired power plants and the absence of a one-stop shop. Additional issues include the necessity for funding and the chance of insufficient control of the permitting procedure. By offering incentives like guaranteed off-take prices and streamlined administrative processes, Kosovo hopes to entice investors.

Similar problems exist in Albania with outdated grid infrastructure, inconsistent planning and regulatory processes, and insufficient zoning for PV installations. For international investors, the implementation of a new law on renewable energy is adding to the ambiguity and uncertainty. Ample sunlight hours, low energy costs, and incentives like PPAs and FiTs attract private investors, nevertheless. The nation aims to enhance its

solar power resources, diversify its energy sources, and promote the self-generation of renewable energy.

Historical challenges in the approval procedure for large-scale solar PV projects in Serbia are being solved, with solar energy gaining appeal due to its affordability and speedier permitting and construction processes. The necessity for storage systems, grid congestion, and the greater risk profile brought on by Serbia's non-EU status are some of the difficulties. It is still difficult to establish adequate government capacity and a solid legal framework. However, investors can move through the process quickly if they have professional people working there. Serbia's energy transition depends on reevaluating who is responsible for constructing storage systems and comprehending the options for available land.

The three countries in question share many of the same issues with regard to bureaucratic procedures, limited infrastructure, financial limitations, and legal uncertainty, necessitating targeted changes and stronger support for renewable energy projects to draw in and encourage investment.

6.2 Limitations

Among the limitations of this work is that the focus is on PV solar projects and that other RES such as wind, hydro, biomass and geothermal need further research and are not included in this master thesis. Moreover, a more comprehensive analysis of the socio-economic and environmental impacts of renewable energy development in the Western Balkans would increase the depth of the study. Another limitation of this work is that it is up to date only for a certain period of time, as national laws are constantly changing and could lose validity. In addition, the study focuses primarily on the investors' perspective and would benefit from including the viewpoints of local communities, policymakers, and other stakeholders.

6.3 Future Outlook

The potential of alternative RES and their integration into the energy networks of Kosovo, Albania, and Serbia could be explored in an extended investigation as potential areas for research. Policymakers could gain important insights by looking into how citizens feel about renewable energy projects and their environmental and economic benefits. This study might be rerun if legislative circumstances alter or if any of the three

nations join the EU. Comparative research with other regions or Western Balkan countries dealing with comparable issues could also offer a wider perspective on the best methods and regulations for supporting renewable energy investments. Furthermore, investigating the effect of technical improvements such as energy storage and smart grid systems in overcoming infrastructural constraints would be a fruitful subject for future research.

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Appendix

A.1 Collection of Data Kosovo

SWOT Matrix	
Strengths	**Weaknesses**
Collected from (United States Agency for International Development and DT Global, 2021, p. 19) • In terms of both the ratio between interconnection capacity and installed production capacities and the ratio between interconnection capacities and peak load, Kosovo is among the top three European nations and has a highly developed transmission system (TS). Through 2030, the installed transmission capacity of interconnectors will be more than enough to support high-RES development. • EBRD support • ALPEX • Clear legislation, rules and frameworks **Collected from: (Ministry of Economy, 2022, p. 17)** • The proportion of RES in Kosovo's energy mix has gradually risen during the past several years. The Ministerial Council of the Energy Community established the national RES objective for Kosovo in 2012, and the Ministry of Economy adopted secondary legislation to ratify it. Kosovo achieved its 25% RES share goal in 2020. **Collected from: (Toby D. Couture *et al.*, 2020, p. 7)** • Kosovo presently has a total installed solar PV capacity of 6.6 MW, according to current estimates. Additionally, there are 60 MW of projects awaiting preliminary authorization and another 3.4 MW of solar PV projects that are now under development	**Collected from: (Schnell, Vučković, and Nicolai Herrmann, 2021, p. 275)** • At the moment, it is believed that the absence of feed-in premium tariffs and competitive/bidding processes have a detrimental impact on the cost-effectiveness and competition of national assistance programs / FiTs. **Collected from: (Toby D. Couture *et al.*, 2020)** • Delays in administrative and permitting processes: One of the main challenges is the three-year wait time between preliminary and final authorizations, which is a relatively long amount of time. • Special requirements for municipal approval to establish solar PV projects: Municipalities in Kosovo must give consent forms for distributed solar projects. These are official papers in which the municipality certifies that the particular project does not interfere with the execution of any municipal development plans or urban plans and that the project does not jeopardize any construction structures. Regardless of whether a project is being carried out in an urban or rural region, the municipality's whole territory is subject to the requirement of the document. This document is brand-new to municipalities, so they are unfamiliar with it in general and with how it relates to solar projects in particular. Investors that wish to invest in distributed PV are put through needless delays as a result of this. • Financial environment: Companies that want to engage in distributed PV typically confront a challenging financial landscape. The two primary financial barriers are high interest rates and a shortage of investment credit. The

	majority of investors fund their projects using their own equity, with local banks only contributing between 30–35% of the required investment cost in the form of loans, with a repayment time of up to 10 years and an interest rate of at least 5%. **Collected from: (United States Agency for International Development and DT Global, 2021, p. 102)** • An extensive list of paperwork proof is necessary for DSO project approvals. • Technical restrictions on producers of equipment, such as the installation of additional electrical protection devices, or additional certification requirements, that are not essential. • Lack of ERO-approved methods for connecting to the DSO grid, resulting in higher costs for bigger solar PV projects due to deep connection requirements or the selection of a connection point further away from the project site. **Collected from: (United States Agency for International Development and DT Global, 2021, p. 216)** • Municipal consent forms and processing times: Each municipality submits municipal consent using a distinct form, as opposed to one that is standardized. • Project approvals for solar PV systems are being held up by the need to get municipal approval. **Collected from: (United States Agency for International Development and DT Global, 2021, p. 214)** • Duration of PPA: In accordance with the Support Scheme Rule, PPAs for RES producing facilities operating within a regulated framework may last no longer than as long as the RES Operators' generation license is valid, as determined by ERO. The length of the Power Purchase Agreement should not exceed 15 years should the RES Operator not be obliged to obtain a generating license.
Opportunities	**Threats**

Collected from: (Schnell, Vučković, and Nicolai Herrmann, 2021, p. 275) • Therefore, in line with the Energy Treaty, of which Kosovo* is a signatory member, premium rates and competitive public tenders are anticipated to be gradually adopted in the near future. **Collected from: (Toby D. Couture *et al.*, 2020)** • Kosovo passed Law No. 05/l-057 on the Establishment of the Kosovo Credit Guarantee Fund in 2016 as a result of this. The Kosovo Credit Guarantee Fund was established to assist in meeting the demand for increased access to financing for micro, small, and medium-sized businesses in Kosovo in order to create jobs, increase local production and value-added services, improve the trade balance, and enhance financing opportunities for small and medium-sized businesses. Special green loans have been provided by a few of Kosovo's major banks. Distributed PV investments are included in ProCredit Bank's "Loans for Eco Investments" program. "Green Loans" are available for investments, including distributed PV investments, through the EBRD. **Collected from: (OMNIA, 2020)** • Depending on the auction process that the Government chooses, the Regulator may amend the Rule on Support Scheme as well as the Rule on the Authorization process to relax the requirements of the Preliminary Authorization, ensuring that developers can obtain the Preliminary Authorization more easily for the purposes of being eligible for the Auction Process. This would guarantee that the majority of developers who wanted to take part in the auction process could easily receive Preliminary Authorizations, ensuring that Article 43 of the Law on the Energy Regulator would still be adhered to. **Collected from: (Todorović, 2023)** • The first auction has been announced. • The Albanian Power Exchange (ALPEX), which introduced a day-	**Collected from (Schnell, Vučković, and Nicolai Herrmann, 2021, p. 275)** • The Republic of Kosovo's 2017–2026 Energy Strategy was endorsed by the line ministry in 2016. With additional objectives anticipated for 2024–2026, the Energy Strategy specifies a RES target of at least 25% of gross final energy consumption for the years 2020–2023. However, given the present trends in RES generation in Kosovo, as shown above, these objectives are not thought to be attainable. **Collected from: (United States Agency for International Development and DT Global, 2021, p. 220)** • Process of a tender or auction: Unsolicited projects and a lack of transparency in the bid process may undermine investor trust and discourage participation from reputable project sponsors.

ahead market two weeks ago, began conducting regular business. According to announcements, it should also cover the Kosovo market* in the summer. • According to the United States Agency for International Development (USAID), the administration of Pristina is working to "decarbonize through competitive, private sector-led market solutions that increase its long-term energy security and sustainability." It was mentioned that Kosovo's energy policy had set a target of 35% renewable energy in the country's energy mix by 2031. • The EBRD helped create the auction concept for renewable energy.	

A.2 Collection of Data Albania

SWOT Matrix	
Strengths	**Weaknesses**
Collected from: (Schnell *et al.*, 2021) • Feed-in tariff: At the moment, feed-in tariffs are used to promote support for the renewable energy sector. Renewable energy facilities are eligible for support through the feed-in tariff provided they satisfy the standards, as stated by Law No. 7/2017 (as mentioned in section 2 above). The installed energy capacity of solar plants must be more than 2MW in order to qualify for the tariff. • Public utilities are required to acquire electricity from these renewable sources for the rate established by ERE after these standards have been satisfied. The tariff will then be given for a 15-year term. The ultimate users are responsible for paying the charges of the energy tariff for these renewable sources. → The existence of feed-in tariffs and the requirement for public utilities to acquire electricity from renewable sources create a supportive regulatory framework. • Solar: With an annual average of 2,400 hours of sunshine and 240–300 bright days, solar energy in Albania has a lot of promise because it poses no pollution or other environmental problems. The annual solar energy production potential is estimated to be between 1,500 and 1,700 kWh/m2. **Collected from: (Energy Community Secretariat, 2022)** • Albania is one of three Contracting Parties of the EC that met its 2020 renewables target. When it comes to the implementation of auctions for renewable energy projects, it has remained a front-runner. • Albania consumed 45,01% of its energy from renewable sources in 2020, above the target of 38%.	**Collected from: (Taylor, 2023)** • Albania produces nearly all of its energy from hydropower, which is seasonal and unable to keep up with the nation's rising energy needs. As a result, the government is heavily reliant on costly imports of fossil-based energy, especially during times of extreme demand or when rivers are low. Since the average annual rainfall is predicted to continue to decline as a result of climate change, hydropower facilities' ability to produce electricity is also being significantly impacted. Up to 2030, Albania's annual energy consumption is predicted to rise by 77%, while the output of big hydropower facilities is predicted to fall by 15%–20%. **Collected from: (Gordani, 2021)** • Being a developing nation, there are frequent reviews of public policy and the legal system that raise concerns. **Collected from: (Kalo & Associates, 2022)** • The restricted storage and grid capacity. • In accordance with the second scheme, private investors may propose to the Ministry of Energy and Infrastructure the construction and operation of solar or wind projects, with private land rights being protected and all electricity being sold on the open market. There is a charge for royalties. In a short period of time, the Ministry of Energy and Infrastructure has received hundreds of applications; however, only a small number of them have been accepted. The remainder still need to be evaluated. Questions have been raised about whether they will ever be accepted, even if they fulfill the feasibility standards.

Collected from: (Svitlana Pyrkalo, 2023) This undertaking—Albania's first major utility-scale solar photovoltaic plant—marks a significant development. It is the outcome of Albania's first competitive solar energy auction since the EBRD Renewable Energy Auctions Programme was implemented there. The undertaking will serve as a template for subsequent Western Balkans initiatives. **Collected from: (Bennett, 2023)** • Through a mix of policy involvement, technical support, and financial investment, the EBRD has been a driving force in boosting renewable solar and wind power in Albania. The Ministry has received help from the Bank thus far with two solar auctions totaling 240MW. • A significant institutional investor in Albania is the EBRD. More than 137 projects totaling more than €1.9 billion have received funding from the Bank thus far. **Collected from: (stopfakes.gov, 2019)** • The government, mostly with assistance from foreign donors, has launched a number of public investments and initiatives during the past ten years to solve the energy sector weaknesses. **Collected from: (Gordani, 2021)** • With assistance from the Energy Community Secretariat and the European Bank for Reconstruction and Development (EBRD), Albania became the first nation in the Western Balkans to implement a renewable energy auction. **Collected from: (Taylor, 2023)** • An EBRD project demonstrates how, with the right policies, the Western Balkans nations can best attract new private investments and offer better and more sustainable infrastructure services, independent of the government's financial and personnel resources.	**Collected from: (personal communication with Anisa Rrumbullaku (karanovic partners), 2023)** • Lack of proper zoning for solar PV and wind generation projects, hindering the identification of areas with high potential for energy development in terms of technical, economic, and land rights viability. • Outdated transmission and grid infrastructure that may not ensure safety when coping with large volumes of renewable energy.

Collected from: (personal communication with Anisa Rrumbullaku (karanovic partners), 2023) • Albania has some of Europe's highest number of sunshine hours per year, presenting significant potential for the development of solar PV for power generation. • Albania is driven by a high necessity to diversify energy sources, as it heavily relies on hydropower and is vulnerable to rainfall fluctuations. This has prompted the government to implement strategies to unlock Albania's solar and wind renewable resources. • Energy prices are driving both local and foreign private investors to tap into the growth potential of renewable energy in Albania. • Incentives in the RES energy sector, such as Power Purchase Agreements (PPA) and Feed-in Tariffs, have attracted prominent energy companies to enter the market, promoting more sustainable large-scale projects. • Proposed incentives like guaranteed priority access to the grid and VAT exemptions for machinery and equipment imported for solar and wind projects further stimulate growth. • There is already a significant number of applications for wind and solar power plants, including projects that do not benefit from government subsidies, indicating promising prospects for future sector growth. • Self-producers of RES energy, as defined in the new draft RES energy law, can contribute to the sector's growth through net billing methodology and remuneration for excess production.	
Opportunities	**Threats**
Collected from: (European Training Foundation, 2022, p. 47) • Investment opportunities abroad: Albania, like the entire Western Balkan region, is promoting foreign investment in the energy industry, and the	**Collected from: (Taylor, 2023)** • Albania produces nearly all of its energy from hydropower, which is seasonal and unable to keep up with the nation's rising energy needs. As a result, the government is heavily reliant

EU's Economic and Investment Plan for the Western Balkans, published by the European Commission in 2020, supports this. The development of the energy industry has been a top goal for the Albanian government for decades due to the wealth of energy resources in the nation. This priority has manifested in government infrastructure and subsidies to assist investments. Traditional European energy corporations have been drawn to the nation by these infrastructure and financial incentives to invest. • Numerous initiatives that are either underway or in the planning stages are benefiting from EU money, collaboration, and loans from international financial organizations like the EBRD. However, the data indicates that further expenditures are required in order to fully realize the nation's enormous potential, particularly its potential for renewable energy. **Collected from: (Energy Community Secretariat, 2022)** • To allow quicker implementation of RES, authorization processes must be streamlined and made simpler. The energy regulator should enter into a direct contract with the service provider and begin using the national electronic register created during the regional project as the designated issuing authority for assurances of origin. **Collected from: (Bellini, 2022)** • Large-scale PV is now being subsidized in Albania through a number of tenders. **Collected from: (Gordani, 2021)** • Its tendency is steadily consolidating in the direction of convergence with EU law. The alignment and convergence of Albania's laws and regulations with those of the European Union (EU) present an opportunity for investors. It indicates a favorable trend toward harmonization with EU standards, potentially facilitating	on costly imports of fossil-based energy, especially during times of extreme demand or when rivers are low. Since the average annual rainfall is predicted to continue to decline as a result of climate change, hydropower facilities' ability to produce electricity is also being significantly impacted. Up to 2030, Albania's annual energy consumption is predicted to rise by 77%, while the output of big hydropower facilities is predicted to fall by 15%–20%. **Collected from: (European Training Foundation, 2022, p. 78; International Renewable Energy Agency (IRENA), 2022a)** • It is necessary to raise public understanding of the financial viability of renewable technologies and their usefulness to industry. The widespread adoption of renewable energy in Albania is hindered, in the eyes of energy customers, by high upfront investment costs in renewable energy and a lack of awareness of payback periods for such investments (Because the public is not always aware of existing incentives, support mechanisms, or plans for the deployment of renewable energy technologies, a greater adoption of renewable energy in Albania necessitates state-backed public awareness-raising strategies to sensitize the public to the direct benefits of renewable energy, both for individual citizens and the country as a whole. **Collected from: (Energy Community Secretariat, 2022)** • The Environmental Liability Directive's requirements have not yet been incorporated into Albanian law. **Collected from: (Todorović, 2022)** • In 2021, Albania generated a record 8.96 TWh of electricity. Solar energy accounted for just 0.4% of total production, with hydroelectricity making up the vast majority. **Collected from: (Taylor, 2023)**

easier integration with European markets and attracting more foreign investment. **Collected from: (Kalo & Associates, 2022)** • Given that electricity costs have reached their greatest points, the Albanian market presents excellent potential, particularly for private investments on the open market. **Collected from: (personal communication with Anisa Rrumbullaku (karanovic partners), 2023)** • The transition to competitive support schemes presents an opportunity to improve the planning and regulatory process for renewable energy projects. • The establishment of the ALPEX (Albanian Power Exchange) day-ahead market can enhance the electricity wholesale markets of Albania and Kosovo, fostering greater market efficiency.	• Increased public opposition to hydropower facilities makes the construction of greater solar capacity even more crucial. Locals have opposed several projects around the nation because they are concerned about the loss of entire towns and communities, irreversible harm to agriculture, tourism, the environment, and cultural sites. **Collected from: (Kalo & Associates, 2022)** • To adapt to global and regional developments influencing the energy field, investors must keep track of ongoing legislative changes as well as institutional initiatives. **Collected from: (personal communication with Anisa Rrumbullaku (karanovic partners), 2023)** • The unpredictability of the planning and regulatory process during the transition to competitive support schemes, including the replacement of the existing RES energy law, poses a threat to project development and timelines. • The statement regarding the non-functionality of ALPEX is no longer valid as it recently became operational. However, the previous delay could have posed a threat to the integration of the day-ahead and intraday electricity wholesale markets.

A.3 Collection of Data Serbia

SWOT Matrix	
Strengths	**Weaknesses**
Collected from: (Wolf Theiss, 2022, p. 201) • Serbia is constantly enhancing its legal system and implementing more and more electronic government procedures. These administrative procedures' effectiveness has inevitably improved over time as well. • Within a monitoring period between 2016 and 2018, which focused on construction, the average number of calendar days to make a decision on the 13,829-construction permit application was 10. In contrast to the former time-consuming paperwork procedure that required months to complete with numerous agencies, this is a significant indication of the effectiveness of the online Unified Procedure portal of the Serbian Business Registers Agency. → The online Unified Procedure portal of the Serbian Business Registers Agency has significantly reduced the time required to make decisions on construction permits. • The goal of the RES Law is to fully digitalize all the processes involving the Ministry of Mining and Energy. **Collected from: (CMS Law, 2020)** • Investors and businesses from across the world are becoming more interested in wind, hydro, biomass, and solar projects in Serbia. **Collected from: (Vajdic and Javshanshvili, 2021, p. 64)** • The transition to the EBRD-supported competitive auctions model will be put into place hopefully, allowing for continued growth of the renewable energy projects. **Collected from:** (personal communication with Miloš Vučković and personal communication with Petar Mitrović, 2023)	**Collected from: (Wolf Theiss, 2022, p. 202)** • Serbia's judicial system continues to be quite formal. Authorities still insist that documents have an apostille and a paper notarization. It is nearly always necessary to have qualified translators translate documents into Serbian on paper. • The majority of rules still allow for significant latitude in the form of requests for more paperwork and data which frequently causes the licensing procedure to be prolonged. • Despite the existence of a working electronic system for the issuance, transfer and cancellation of guarantees of electricity origin, the European Commission observed in its 2021 report on Serbia that no additional progress had been achieved in 2021 to streamline administrative processes. • Moving away from licensing, making sure the necessary real property rights are in place is crucial for project development in Serbia (especially for solar projects). In actuality, this is frequently a difficulty because of unresolved ownership disputes or a large number of private owners, as this is frequently the case in rural areas where projects are normally undertaken. Negotiations with the relevant owners are frequently inconsistent and need an adapted approach for each individual circumstance. **Collected from: (Vajdic and Javshanshvili, 2021, p. 64)** • A single administrative entity has not been formed, and licensing procedures continue to be drawn out. **Collected from:** (personal communication with Miloš Vučković and personal communication with Petar Mitrović, 2023)

• Often the solar panels are regarded as immovable, although in some situations they are regarded as movable. For a project funding and selecting the proper security measures, the distinction is essential. • In comparison to the European Union, Serbia's permission procedure moves along more quickly, taking roughly 2 years to complete with a capable local team.	• Inadequate legal certainty about government pledges and shortage of capacity of governmental agencies are examples of weaknesses. • Only about 20 MW of solar capacity were constructed in Serbia between 2009 and 2021, making it historically poor in terms of solar power development. • Uncertainty regarding the legal standing of solar power plants, whether a panel is viewed as movable or immovable.
Opportunities	**Threats**
Collected from: (Energy Community Secretariat, 2022) • Serbia should go forward with the implementation of renewable energy auctions and swiftly approve the outstanding bylaws, particularly the one on balancing responsibility. **Collected from: (Vajdic and Javshanshvili, 2021, p. 64)** • Since solar has so far been a huge failure, stakeholders are expecting the Serbian government to introduce further incentives. Notably, the Serbian Ministry of Mining and Energy claims that preparations for the legal framework required for the implementation of "net metering" in Serbia have already been made. If properly carried out, this plan would undoubtedly attract private investment in the Serbian solar sub-sector and, ideally, support its further growth in the upcoming years. **Collected from: (Wolf Theiss, 2022, p. 211)** • Environmental protection: In order to become a member of the EU, Serbia has committed to a number of environmental protection commitments, many of which are directly related to the energy industry. This is especially clear considering that coal-fired power plants still provide about 70% of the electricity used in Serbia. **Collected from: (Energy Community Secretariat, 2022)**	**Collected from: (Wolf Theiss, 2022, p. 211)** • Coal-fired power plants still provide about 70% of the electricity used in Serbia, posing challenges to achieving environmental goals. **Collected from: (Energy Community Secretariat, 2022)** • Environmental impact assessment: The failure to implement Directive 2014/52/EU on Environmental Impact Assessment (EIA) has resulted in a breach that has been identified by the Ministerial Council. Draft modifications were created and the consultation procedure was started, however it was not completed. The potential for awarding construction permits (development permission prior to the EIA consent) is another non-compliant aspect of the present legislation that is intended to be addressed by the changes. → The failure to implement the Environmental Impact Assessment (EIA) Directive has resulted in identified breaches and non-compliance. The potential for awarding construction permits without EIA consent is another non-compliant aspect that needs to be addressed. **Collected from: (Wolf Theiss, 2022, p. 202)** • It should be emphasized that in order to build connection infrastructure, the grid operator (i.e., the TSO and DSO) must secure the necessary

• In the most recent reporting year, Serbia was able to cut its emissions from big combustion facilities; this pattern should continue. → The reduction of emissions from big combustion facilities in Serbia should continue. **Collected from:** (personal communication with Miloš Vučković and personal communication with Petar Mitrović, 2023) • The feed-in tariff system, which was not financially viable for small plants, was the main cause of this. The situation has now altered, and solar is currently gaining popularity because of its affordability and somewhat quick regulatory and building procedures. • Solar power development has been historically low, indicating an opportunity for market growth.	permissions and real property rights. This need is made easier by the legal provision that allows the investor and prospective power producer to actually plan and carry out construction activities, even if the project is legally in the name and on behalf of the grid operator. As a result, it is crucial to coordinate your efforts with the grid operator during this procedure. Contracts with grid operators are made for this purpose based on their set templates and are often not negotiable. → Contracts with grid operators are often not negotiable, potentially limiting flexibility for project developers. • It should be emphasized that in order to build connection infrastructure, the grid operator (i.e., the TSO and DSO) must secure the necessary permissions and real property rights. This need is made easier by the legal provision that allows the investor and prospective power producer to actually plan and carry out construction activities, even if the project is legally in the name and on behalf of the grid operator. As a result, it is crucial to coordinate your efforts with the grid operator during this procedure. Contracts with grid operators are made for this purpose based on their set templates and are often not negotiable. **Collected from:** (personal communication with Miloš Vučković and personal communication with Petar Mitrović, 2023) • Investors may be impacted by credit ratings and financing choices due to Serbia's non-EU membership and greater risk profile. • As the grid infrastructure is not adequately built to support the anticipated amount of renewable energy projects, grid congestion is seen as a key problem. In the upcoming years, grid-related operations, especially

	grid storage, are anticipated to present the greatest challenge. • The necessity to establish storage systems in order to connect to the transmission system, however, presents a problem for new projects and might increase project costs and complicate financing. • Negotiations for financing a project may become more challenging because Serbia does not accept the idea of a floating fee. It is common practice to pledge the panels and create a mortgage on both of them and the facility as a whole in order to undertake this mitigation measure. This practice is not uniform and it will become a more crucial legal concern in the future.

A.4 Interview Transcript 1

Miloš Vučković and Petar Mitrović (karanovic partners)

M: So maybe then it would be the best if you can jump on the, on the questions. So let us know how you would like to proceed and what would be like the format for the discussion.
Anna Tutner: Um I think, because I picked or I developed a lot of questions and time is limited. Um, if it would be okay from the questions for each uh more or less um topic, I would just pick out one and, umm, that summarizes well that area, if that's okay for you as well?
P: Of course, if you want you can share the questions on screen if you have them in electronic version .
A: I'm here on my iPad but I can try.
P: We can do it, no no no, don't bother. Shoot.
A: So yeah, my first um question would be or starting right into the authorization procedure, um. So first how is large scale photovoltaic first defined in Serbia? And as well if you could explain me the overall process and perhaps summarize me the steps when there's an investor and he buys land and he wants to develop it into photovoltaics park.
P: Miloš if you agree, I will jump in there.
M: Of course.
P: Solar power plants large-scale ground mounted, I suppose you refer to them not rooftop, but ground mounted.
A: Yeah.
P: They are cited as a facility which is subject to permitting and spatial planning authorizations, more or less like any other facility which you regularly see. In terms that uh, it is subject to uh preparation of adequate zoning, zoning plans and after zoning plans, appropriate construction designs and of course construction permit and after construction, commissioning, testing and utilization of use permit. Just to just to end before we continue, when it comes to the land for solar land, it does not have to be ownership. So the law is rather capitalize there, it allows that the solar power plant is constructed on the basis of a lease, easements or ownership when we are talking about private plan. Generally, there is a possibility that you use state owned agricultural land for construction of PV projects. If the land is of lower quality, so falling inn categories 6 and lower in terms of fertility of the land. In a nutshell, uh, the development process is such that you are doing certain activities in parallel. These activities as initial activities done in parallel include land acquisition. Um. Think that a good connection unit and infrastructure needed and planning design. You want to do that in parallel in order to make sure that the basis for the project is properly set. Spatial plans are usually not available, do not exist to the enough level of details in local municipalities. So, the investor would generally cooperate with our local community, with the local municipality of finance the activities of preparation of zoning plan and after that coordinate the activities in relation to adoption of the zoning plan. But the adoption of the zoning plan is incomplete, direct discretion of the local community. So, the investor needs to have a good cooperation with the local municipality in order to have that in place. Spatial plan like anywhere else in Europe, would set out parameters for technical construction, location of the facility and the overall aspect. Further processes include uh, preparation of design. Multiple designs are needed throughout the development. I would not bother with you with the specifics, but the last one is so-called Construction Permit design which is prepared which basically puts down detailed specifications for construction. At the same time, environmental impact assessment study needs to be prepared, and the environmental impact assessment study is a part of the construction

permit design. So, you need to have the environmental impact assessment prepared before the construction permit because it will be part of the construction permit design, but it does not have to be improved, uh approved before the issuance of the construction permit. You can commence the approval processes after the issuance of construction permit provided that you cannot, uh, that you cannot, uh, start construction until the environmental impact assessment is approved. The authority for all of these permits is usually on the state level, if we are talking about the projects of that size. Between 10, above 10, but I thought you were interested in 50. Yeah, or large scale in general?
A: Large-scale in general, yes.
P: so large-scale is above 10 MW. That's commonly understood when we are talking about large scale, that's at least, I mean 10 MW even 10 MW is not large scale enough, but it is, let's say the threshold for different authorizations activity. These projects will subject to the authorities apart from the zoning plan which is on municipal level, will be subject to the authorizations on the central government level if they are located in central Serbia or the level of autonomous province Vojvodina, uh if they are located in Vojvodina. And they will be always connected to the grid, to the transmission system, not high voltage transmission system. That also means that investor needs to cooperate with the transmission system operator because Serbia has specific regime in terms that the transmission system operator has to be holder of the construction permits that are issued for issuance for construction of a great infrastructure. So, it's not like in some other jurisdiction where you as a private investor could construct the transmission line and high voltage switch yard and then sell it or transfer free of charge to the TSO. It has to be the TSO holder of the construction permit from the very beginning, but the investors are the ones running the process in terms they are engaging contractors, they are bearing the cost etc. But considering that the TSO is the holder of the permits, you need to do all of that in close cooperation with the transmission system operator. When you have all of these permits, you can start the construction after the construction is finalized, there is a commissioning. The commissioning also requires significant involvement of the TSO. And various inspectors that should confirm that the project is constructed in accordance with the construction permit and relevant documentation. Once these commissioning processes are over, you have issuance of the use permit and after use permit, issuance of the electricity generation license and at that time you are allowed to be permanently connected to the grid and entering to a great access agreement or great use agreement with the system operator that should regulate the process of utilization of the power plant and utilization of it. So that's in a nutshell.
A: Thank you very much.
P: Um one, uh, sorry. Did I understand correctly that the course has, uh, legal background as well?
A: Yes, definitely.
P: What is interesting when it comes to solar power plants is let's say not completely clear status, um, what is considered to be part of the building and whether the panels, when installed will be treated as movables or immovables. To be on the safe side, and they're usually treated as immovables but there are also certain, let's say theories, but also in practice, that it can be, uh, the situation where you basically can have uh solar panels that are installed even treated as immovables. And that's not only important from theoretical aspect, it's much more important when it comes to treatment of these facilities in particular for project financing purposes, meaning which kind of security instrument you can establish over that, because movables may be subject only to pledge, immovables only to mortgage and Serbia does not recognize the concept of floating charge, so it can create, let's say, a little bit of nervousness in the project financing negotiations. But so far there

have been no problems. So, we usually do both. I mean, we usually pledge the panels, um, and still have also the mortgage over them as well as the part of the facility. So, to be on the safe side from both aspects, irrespective of what the courts would decide in each particular case, because the practice is not unified but it is for example a legal issue that, uh, will be increasingly important in the future.
A: Thank you for that insight as well. I think during my research, um, I encountered I think most of it, except for some aspects of course not. I think I might only ask a very short question regarding the environmental impact assessment because during my research for each region I actually found, there is a lot to be found when it comes to the environmental impact assessment. However, I wanted to ask if the environmental impact assessment differs if it is a project that stays within the local area or if it differs as soon as there is for example a financial participant of the European Union or even an international donor of the project?
P: This should be split in two different questions. When it comes to uh purely regulatory framework of Serbia and then there is no difference who is the owner, what are the funds granted, etc. The size of the project, the location of the locality, whether it is close to protected cultural monuments or natural areas, that's what makes the difference. But what counts important in practice is that if you are financing the project on the basis of the project financing where you have the largest international banks or the international financial institutions involved then they have their own standards that you need to meet in order to so-called fulfill bankability criteria and be eligible for these kind of laws and these environmental impact assessment studies, these international are usually called environmental and Social Impact Assessment study and they're using higher standards than the national legislation.
A: Thank you. I would now jump to my next question. Which would already be regarding the SWOT analysis. But it is also a bit of a personal question in that regard. So in your opinion, what do you think of the current situation? And regarding perhaps as well as the potential of growth, what are the strengths and weaknesses of the current authorization process for large scale photovoltaic projects in Serbia? And as well, what are the strengths and weaknesses from the perspective of an investor?
P: Solar is definitely underdeveloped in Serbia because historically, you had only the first PV scheme was introduced in Serbia in 2009 and in the period between 2009 and 2021, so 12/13 years, only around 20 MW in total of solar was installed. The key reason for that is that the feed-in tariff primarily designated for small projects. And at that time these projects were not financially sustainable with our feed-in tariff. The situation is now different. Solar is becoming increasingly popular technology due to costs and due to, let's say, relatively fast procedures, not only permitting procedures but also fast construction process. So, I think that perspective for solar is, um, let's say bright. When it comes to permitting, I think it's uh, the permitting, I think, is a bit faster than in the European Union. If you have, um, adequate local team that is familiar with the local processes that is ready to build from the initial, from greenfield, so from the concept to build which means that you have all the permits in place, I would say 2 years should be enough to finish that if you have adequate local team. What will be tricky for the new project is the necessity to install storage, storage systems if you want to be connected to the transmission system. This will have negative impact of course on CAPEX of the project, it is questionable how it will be financed. But considering that it is a complete novelty, but introduced literally seven days ago, it's yet to be seen how this will reflect, but I would say if, uh if I would need to single out uh, one weakness in particular, it would be the great congestion and considering that grid here as well as in the rest of the Europe is simply not developed enough to intake this additional renewable resources projects to the volume expected or

needed to meet the green transition targets to 2030. I would say grid congestion and related activities, including grid storage will probably be the most difficult or challenging issue in in the next couple of years. Not the permitting, but the grid.
A: Yeah, yeah, I agree. I think and that problem we face everywhere at the moment. And now to the other part of this world analysis, what do you think are the opportunities and threats of the authorization process and as well again from the perspective on from of an investor?
P: Well, Serbia is not EU country and so by definition it has a bit of a higher risk than in the rest of Europe, in the rest of European Union, which also, I mean, has implications on the credit rating of the investor, of the borrower or of counterparties, for example, I think it would be impossible to obtain the financing for, if your project is going to be off taken by the, or the electricity generated in your project will be off taking will be updating from a local trader or local customer, it would be hard to achieve. But the weakness is in particular, I would say maybe under capacity or the institutions under capacity of the governmental bodies, especially in the situation that you hear increased number of requests, that's one thing. The other thing is still even though it has been improving significantly. Still, inadequate level of legal certainty in terms that what the government committed to do will not be changed too soon. For example, we've now had the amendments to the Law on Renewables that was adopted only two years ago and these amendments were substantial for only a two years period. So I would say that's the biggest obstacle, the biggest obstacle. As for the opportunities, again, and I cannot stress that enough if you have adequate local team, then the process can be finished at relatively good pace with reasonable level of certainty and to the outcome. And of course the liberalized, the liberalized status of the land, where you can basically discuss and decide what's the most suitable, um, for your because you have a range of options from legal perspective and then you are basically have the opportunity to decide what would be the most suitable for your business case.
A: Is there as well, um, one particular change or shift that you wish for or that you would recommend in the current legislation framework?
P: This obligation to construct storages, it's probably, uh, not the most adequate solution in the way it is put, so I think depending of course, on what will be the desires of the government. But if they wish to proceed with the great Transition at the pace required, I think this obligation to construct storage or 20% will probably need to fly out considering that it will be a significant burden to this. And of course, considering that Serbia has pretty good hydro potential, pump storage, hydropower plants that are necessary in order to have a proper renewables integration into the system for the balancing and the ciliary services purposes, I would say that it will be necessary to find a way how to fast to speed up the procedures necessary for construction of pump storage hydropower plants and to gain financing for these projects in order to allow further integration into the grid on renewables.
A: And just out of interest, one question, um, do you know how many pump storages there are in Serbia?
P: A couple of them now, but it will be necessary to construct the three at least to construct 2 new ones rather large in order to meet these targets that are supposed to be met. I mean currently we don't, we don't have the target set yet, but it will probably be around 45% of entire generation coming from renewables, which is significant increase considering that now approximately 2/3, so 65-66% is coming from thermal. So, it will be a challenging task. T

A: Thank you. And I would already or yeah, follow up with the last question which you could have asked before, but um, where is the, or what is the current rule on, um, the Feed-in tariffs at the moment?
P: They're done, they're done, they're not allowed anymore. So actually ,feed-in tariffs will be possible only for projects when it comes to solar projects of up to half MW. But I think nobody's count counting on them anymore. They're half a MW that's basically a implemented European directive. Mm-hmm. So half MW for all technologies apart from wind, that's three MW, they will be awarded in public tender. So it will not be fast come first, first come first served anymore, but rather a tender process, auction process. But I would not expect them anytime soon and they will probably be not the facilitator or the main driver, considering that they will be available only for small projects, so 500 kW.
A: OK. And um. One last question now.
P: Um, yeah, we need to wrap up.
A: So yes, no, promise. My last question. The rule at the moment on the power purchase agreement. Yeah, what is, what is the situation there at the moment?
P: Uh well uh. It is liberalized in terms that you can decide whether you are going to sell the electricity on the basis of the power purchase agreement with an off taker or corporate power purchase agreement with consumer in Serbia or it will be some sort of combination of financial PPA with physical PPA. It is all possible. Plus of course Serbia has operational, uh, day ahead market and there will soon be intraday spot market implemented, which is also one of the options for selling the electricity. At this moment we have one project, although it is in wind that is financed on the basis of a private PPA, that's combination of physical and financial PA. No corporate PPA with consumers yet. And generators are now discussing opportunities to sell their electricity on spot market and the traders' involvement there would be probably to allow or provide for the routes to market which means or related services balancing and the nominating and forecasting.
A: OK. Thank you very much. Umm, it's highly appreciated.

A.5 Interview Transcript 2

Anisa Rrumbullaku (karanovic partners)

Anna Tutner: Like I said, that's also how I found you. I found one guide for investors on renewables energy. But I think it's from 2021 and it's on it's and I think it's yeah, on several countries. And that's also how I found you. And I contacted you and yeah.
AR: Okay. But I will share that with you because it's easier. I mean, even if I tell you things now, I'm even in my head, we still have to see to look at every single one kind of clients ask us because it's that's how it is. It's not like the process. It's streamlined in a way, but it's not easy to kind of find the, you know, the whole steps. One by one, you do these and then you go to these and this is like someone has to struggle to find out. So yeah.
A: Um, but um, yeah, and I really want to underscore and I'm so thankful that you're helping me out.
AR: Now of course mean, I would have appreciated its help when I was doing my master's thesis and I did get some, so I totally understand you.
AR: Um, so if you want to go through the questions, but I will also, I will ask one of the associate that works with me in the Energy Department to kind of put in writing some stuff for you, like when you ask about which is a participant minister responsible for the environmental impact assessment, I can tell you now, because then I think again, then you may be also have it in the list that I sent. I can also give you like the the responsible I'll I'll put the name down there I think.
A: And I mean even though the list that you sent me already indicates very often which institution is responsible.
AR: Yes. Exactly.
AR: So we will go to the interview questions. I will just rush now because I have a meeting so I kind of start to pick up until thirty. Authorization procedure. You have it in the list, right?
A: Yes.
AR: There's not only one that you already have there you know the full list and then I think these are tender documents for they'll be first will help you. So because it's kind of a tells well it's an investor when they apply for the auction procedure which is different from a privately initiated procedure because you have like investors who start on, you know, on a private basis, they have they have identified an area. They all need their listing and they apply with the minister directly to get like an authorization to build on, let's say, solar plants. And they enter into this project development agreement and then they open authorization and they have to enter into a private power purchase agreement and so on. The auction procedure, maybe, you know, which is like the government triggers, so starts the process and what they offer is the subsidy of a power purchase, which is a public PPA, okay, but if in this case it doesn't differ a lot because you still have to procure, you know, the the land, you still have to apply for the permits on your own and so on. But this material, this kind of that I will share with you, it's kind of a guide to investors as to what they should do prior to applying for, you know, for somebody to prior to submitting their offer to the ministry. So it's kind of a concrete kind of guide as to what they should do, not the final one, because just like I'm saying, when you apply, when you submit your offer, but it's still the details, a little bit like the construction permit especially, which is not an easy process in Albania at all, and acquisition of land rights again, which we still have some maybe different background from Kosovo, Serbia, because we're like we used to be a communist, think everything was based on down to the nineties. So we had huge problems still with the land rights basically like overlapping,

you know, a private ownership with state ownership lots of state-owned area still that you have to maybe lease from the local government or the central government. So this is this is all on as to what they see, like the one of the biggest issues, especially for foreign investors, they don't have direct access to the market because local investors, you know, they they manage that foreign investors when they come, they cannot do it right away. I mean, they need to find a local partner first to help them to guide through, you know, these initial stages of the project, especially acquisition of land rights and also permitting, because as you saw, it's not very easy. So they they kind of need the local partner to help them through the process.
A: Yeah.
AR: So it's very common that we see lots of local companies applying for on this project, mainly construction companies that they are very familiar with, you know, the special loans and everything they apply and they either go for financing and some, you know, equity on their own or they tend to find like foreign investors or of course they have an interest now because this is like the trend. So there's sort of energy companies, but there's also private equity funds that now are trying to source projects in the market that the initial development stage or just then they have acquired these contract with the Government project development agreement as I mentioned in the lease that's it and then they will together joint efforts to develop the project. Yeah.
A: Okay. That's a good point. I haven't mentioned that yet in my thesis.
AR: Yeah, that's that's I think something that it's more kind of I think also maybe in Serbia and Kosovo is the same thing, because it's so kind of, let's see a sector that requires lots of permits and it has lots of legal issues involved. So sometimes easier for foreign investors than of the market that have not been in the market there really, because we have then companies that have been in Albania engaged, for example, in hydropower projects, not in solar, and they are from either. So they don't need the local partner. But it is like some new company that has not been in Albania before doing business. I see that they they want a local partner system, you know, in the initial stages of the project. And then.
A: I mean, yeah. Also because it's yeah as you've said, a new area of interest and still to. Still a challenge. And it comes with challenge also afterwards.
AR: Yeah. Yeah, yeah.
A: Um, one question that I also have is just a very general question. How like, what is the the definition of large scale solar? When is it characterized as small and one as large? Let's, let's take the border there.
AR: There's not a border in that sense. There's kind of another criteria, but that again, I wouldn't see that I'm making the decision between big and small because the small is too small. So in the renewable energy law now, we still have to get up to date with the new law. So we've we've been in touch with it, has just recently published. And I will see that that's changed. But the renewable I think that's the same. I will check and just get back to you on this. There is this distinction that for any on solar and with Europe. This is just about solar?.
A: Only solar, large scale solar photovoltaic.
AR: Is all. So the law says that for any solar project under 2 MW, you you automatically you qualify for a government subsidy in the sense of a public PPA agreement which price is established by the government. And then. There is a above that then you don't get these public PPA. So anything that it's above 2. So this qualifies as a big power plant but it doesn't fall within these small power plants anymore. I don't know how to put it. So this the only kind of that again I would check in the new law, if there is some needs there introduce some concept of large. Yeah. solar projects. Under two it's considered

small above two by you know just fold it in the deep that it doesn't make so much sense to me but and then under two you get the, the that these kind of public PPA FiTs basically.
A: Yeah. Okay. Yeah I, I mean I tried already to look into the new law on renewable sources, but it's in Albanian so I was relying on online translation.
AR: Yeah. Yeah. That that will we will look at for you don't worry. Let me just because I'm I will have like two questions that you're asking in red I would just underline them. And so this was the question was about?
A: I don't have it included. I think.
AR: Ah you haven't. Okay. Yeah, there's nothing. Look, I'll just make a note then.
A: But yeah, maybe.
AR: So. Or maybe you can just leave it open again. I will make a note don't to worry.
A: And maybe now I would actually focus on the. Strengths and weaknesses and opportunities and threats. I mean, you already provided me as well good statements on that in your email, but is there any like big obstacle or challenge that you think really urgently needs to be improved? And also then on the other hand, what would you say is like the big strength of Albania in in the whole process of getting the authorization?
AR: Strengths regarding the authorization per se?
A: And as well as what has been accomplished.
AR: But I really can't really see a strength. But the government is like I don't know about the other countries, but I think is the same. It's a really interesting thing of shifting their renewable energy sources from hydro now to solar and wind, because Albania is a country that is so far is relying totally on hydro. We have renewable energy in our country, but we depend on our rivers basically and rain and this makes it a net importer of energy, even though there's there's lots of hydropower plants. The biggest ones, of course, are state-owned, but there's also lots of privately owned hydropower plants and projects. So there's these governments are really objective to increase the solar generated capacity in the market and to this end, they have done two auctions already for large solar plants. I think you know that that it's Voltalia the french company. And is there is still continuing in this fact because there they have just recently announced that during this year they will again launch new auctions for solar projects. We you know, public PPAs in place for a total of 500 megawatts capacity. Now, when no option is involved, it means that even the contract with the government is more structured than just tender sponsored that you do when you privately apply for the process. So there is room to negotiate that the government will help with the permitting process. For example, it's not that they will do a favor, but they will at least engage that there will be no delays in the process. You know, everything on the side of the investor is okay because we're a country that you see there's bureaucracy, some lack of responsibility from the authorities. Like they they don't carry on same or delayed beyond the time line to process. So this is kind of I see that this way of pushing through the increase in you know the renewable solar capacity the market through the options is a good is an advantage because one, you attract investors and in this case, serious investors like this are not companies, but really energy companies that have a reputation and name and experience. They come into the market because also they have these assurance that they have the government on their side, which will help them through their process, basically. So this is I see one advantage strengths, if you want to call it this, it is driven mainly by these projects that are that are following these public auctions procedure basically, or tender procedure. Then? No, I did not. I mean, I'm a bit pessimist about Albania in the sense of always having trouble with the permits and even, you know, as lawyers, though. So I cannot say that the process is easy and we have some great strength there. Yes, we always

feel comfortable when you have the opportunity to negotiate the contract with the government, the project development agreement and some assurances are offered by the government and in this case.
A: Yeah, but I think that and the whole auction procedure that is already kind of established is, it's a strength. And also in comparison to the other countries in that sense, I think Albania is a forerunner.
AR: Yeah. I don't know. Yes, I mean, I think so. And then I don't know about the situation in Serbia, so I've talked about so many things.
A: And I think Serbia and as well, I think Kosovo has already announced its first auction. And so and Serbia. I don't think yet. I think. Yeah, not yet. I think.
AR: Okay. Yes. Now and then that kind of creates, so let's say some comforting new investors in the market because through the auction, as I said, to attract names like Voltalia.
A: Mm hmm.
AR: And then they established a presence because they already they they won two auctions. They're in the market. They're developing the project, getting all the permits. And that offers them to two other investors. The assurance and the comfort, that yes, we can manage and we can also thrive in this market. So. Mm hmm. So that's I would I would see that as an advantage, especially in the process.
A: Yeah. I'm okay I think. Yeah. That from my side. I'm good.

A.6 Material provided by Ditron Hyseni

Our topics focus on large-scale PV power plants in Serbia & Kosovo, above other, on steps and obstacles investors/project developers step into. We start from the assumption project implementation steps for such large-scale projects look like this:

0. Project idea (this idea shall be developed by team of experts) – 1 month.
1. Founding SPV (responsible Ministry of trade and Industry- appr 1 month)
2. Information, Grid Capacity reservation (Transmission, system and market Operator- 1 month
3. Land Lease (option) Agreement (SPV and landlord 2 weeks)

Changing land status – Municipality – 1 month period

4. Conceptual Design (SPV- 1 month)
5. Pre-feasibility Study (SPV- 1 month)
6. ESIA (SPV- Ministry of Environment- 3 months period including public hearing and discussion with community)
7. Environmental Consent (approval) 3-month period from date of application-related to point nr 6.
8. Preliminary Design (approval) (preliminary design approval from Transmission, system and market Operator- 3 weeks)

Topographical survey (outsource – 3 weeks)
Design of the transformer station and trafostation (outsource -2 months)

9. Feasibility Study (SPV – 2 month)
10. Detail design (SPV 2 weeks)
11. Construction Permit (divided into two phases – construction condition- 2-month period- including disclosure of the project in the MESPI website-discussion with interested parties and community- second phase Construction Permit 1 month period)
12. Final Authorisation ERO After getting construction permit, Final Authorization takes 45 days.
13. Energy License. Energy license is taken after project ready for start up, and trial run finished – Energy Regulator issues the energy license in the Board meeting.
14. Financial Closing

1. Could you please elaborate on these steps (how long they approx. take, who is the responsible authority involved, etc.), and explain if they are all indeed necessary for realization of large-scale PVPP projects in Kosovo and Serbia?

2. In your opinion, what are the strengths and weaknesses of the current permitting process for such projects in Kosovo and in Serbia? And what are they from the perspective of an investor)

From the perspective of the investor, the process of getting the permits is burocratic. The primary legislation, secondary legislation and administrative instructions are not aligned in different Ministries (in regard to RES projects).
The one stop shop is not in operation. This would easy the work for investor.
For example: The Municipal development plans is made once in a 4-year period. If the investor shows up with a RES project, The Municipality cannot include it in their zoning MAP. This takes a lot of efforts and time-consuming process for such changes.
The Forestry Agency – does not have in their legislation, a permit for changing the status from forestry to construction land (for more than 20 Ha land) for RES projects.

3. What are the opportunities and threats of the current permitting process for such projects in Kosovo and Serbia? And what are they from the perspective of an investor?

A research study with the business community operating in this sector, in order to better address their problems was done. The findings of the research reveal that there is a political unwillingness to fully embrace renewable energy sources, as the focus is on supporting lignite power plants. Moreover, Kosovo is falling behind its trajectory in reaching its targets for RES-E and RES-T. The barriers faced by the business community are numerous starting from lack of ambitious RES policies to specific problems with national institutions. Likewise, there are many struggles with acquiring funds for constructing RES projects, which pose further hurdles to RES penetration into the market. Kosovo needs to genuinely embrace an energy transition aiming towards renewables and build a visionary longterm policy for deployment of RES into the market.

It is a very good opportunity for the Government to show willingness and see what are the barri-ers for the foreign and/or local investments regarding permitting process.
One stop shop is one of them.
Harmonize the legislation for RES, in line with Kosovo Energy Strategy.
Through change on the legislation and harmonization with administrative instructions the Government can make the process easier and attractive to foreign investment and meet their RES targets.
The threat could be not controlling the application process for the RES, and overloading the grid

4. How does the relevant authority make sure ESIA is done in a thorough and comprehensive manner?
The Ministry of Environment, Spatial Planning and Infrastructure has e special Department deal-ing with Environment. They have the experienced staff for checking the ESIA studies. Further-more, the MESPI organizes the training and licensing the local experts for ESIA. According to the local legislation the individual licensed consultant and/ or licensed local company have to prepare and sign the ESIA Study. The legislation of ESIA is in line with EU legislation.

5. What are the efforts (of Transmission System Operators of relevant countries) in constantly allowing for higher amount of PV electricity that could be introduced to the grid? Could you explain technical reasoning how does this work, what are the options for such expan-sions in regard to given grid capacities?

In order to integrate higher amounts of PV electricity into the grid, Transmission System Operators (TSOs) play a crucial role. They undertake grid capacity analysis to assess existing infrastructure and determine its capability to accommodate additional PV generation. Upgrading grid infra-structure through measures like expanding transmission lines and constructing new substations helps increase capacity. TSOs employ advanced grid management techniques, such as smart grids and energy management systems, for real-time monitoring and efficient utilization of grid resources. They establish grid codes and connection standards to ensure PV systems meet technical requirements and may require reactive power compensation to regulate voltage levels. TSOs also utilize forecasting and predictive analytics to anticipate PV generation patterns and implement flexibility

mechanisms like demand response programs and energy storage to manage intermittent PV generation. These efforts collectively aim to enable higher PV penetration while maintaining grid stability.

6. How are the auction and bidding rules designed to encourage competitive pricing and quality standards for such projects? Could you explain the logic? Are investors being supported enough financially in your opinion, considering the benefits of such projects? How, and why?

Kosovo launched an auction for awarding a 30-year concession contract for the construction and operation of a 100 MW solar photovoltaic plant in a publicly-owned area in Rahovec,
To attract private investors, Kosovo is offering crucial advantages, such as the identification of an appropriate development area, a guaranteed purchase price and effortless administrative procedures,
The winning bidder will sign a 15-year power purchase agreement and will lease the area in Rahovec, in Kosovo's southwest, for the term of the concession.
The project should be completed within two years from the signing of the contract.
https://reskosovo.rks-gov.net/

7. Are there any regulatory or policy frameworks in place to encourage the implementation of mitigation measures in solar photovoltaic projects in Kosovo and Serbia?
Regulatory and policy frameworks are in place in Kosovo to promote the implementation of mitigation measures in solar photovoltaic (PV) projects. These frameworks have been established to encourage sustainable and environmentally conscious practices throughout the development and operation of PV projects. Here are some examples:
1. Environmental Impact Assessment (EIA): Kosovo mandates an Environmental Impact Assessment for PV projects, which evaluates the potential environmental and social im-pacts of the project. It addresses concerns such as land use, biodiversity, and local communities, ensuring that mitigation measures are incorporated to minimize adverse effects.
2. Grid Connection Standards: The regulatory framework includes grid connection standards that PV projects must adhere to. These standards specify the technical requirements for connecting PV systems to the grid, ensuring safe and reliable operation. They may include criteria for voltage regulation, power quality, and grid stability, indirectly promoting the implementation of mitigation measures.
3. Renewable Energy Support Schemes: Kosovo has implemented support schemes for renewable energy, which serve as incentives for PV project development. These schemes can involve feed-in tariffs, power purchase agreements, or other financial benefits, creating an advantageous economic framework for PV developers. By promoting the utilization of renewable energy sources like solar PV, these schemes indirectly encourage the implementation of mitigation measures.
4. Environmental Regulations and Standards: Kosovo has established environmental regulations and standards applicable to PV projects. These regulations establish guidelines for issues such as air emissions, water management, waste disposal, and noise pollution. Compliance with these regulations necessitates the incorporation of mitigation measures to minimize environmental impacts.
5. Climate Change Mitigation Strategies: Kosovo has recognized the significance of climate change mitigation and has developed strategies and action plans to reduce

greenhouse gas emissions. PV projects, as renewable energy sources, contribute to these mitigation efforts. The policy frameworks emphasize the role of solar PV in reducing carbon emissions and transitioning to a cleaner energy system.

Annex

A:	General Requirements for developing PV Project
	Business registration Requirements
1	Certificate of Registration as a business company issued by KBRA, registration of (SPV)
2	Evidence on establishment of the enterprise (Status of the enterprise)
B	Application for preleminar authorization
1	Evidence from competent court proving that the applicant is not involved in a liquidation/ bankruptcy procedure; that his/her business is not administered by the court and his/her commercial activates are not suspended;
2	Evidence from competent authority proving that the applicant meets legal obligations on tax payments in the country where the same is registered as a legal person;
3	In case of Partnership:
4	Evidence in the areas related to implementation of the contract/s/Projects
5	Reference on the business experience of the applicant or partners in the field of RES or similar
6	Support letter from the bank or any lender.
7	Audited Financial Report of the last three (3) years, certified by competent institution or certified Financial Auditors.
C	Technical and Organizational Requirements (Evidence/documents to be attached:)
1	Technical Feasibility Study including climate and meteorological conditions for the project area according to the type of generator, technical description of selection of each element of the generator based on the above data: calculations on which the selections are based, the study, calculations and selection of equipment for connection to energy network
2	Study and analysis of geological-engineering conditions of the area where the project shall be implemented
3	Organizational Structure of the Applicant and CVs of the staff
4	Business Plan (Total cost of investments and financing, Economical-Financial Evaluation of the Project).
5	Detail technical design
6	Technical information on connection issued by KEDS or KOSTT, depending on the capacity level.
7	Consent by municipal authority to transfer the land from agriculture to construction land
8	Evidence on the right to use the land and property state of the land that shall be used for construction of the generator, possession list, plan copies, agreements/contracts on use of private/public land etc.);
9	Public consultation of project developer with the citizens in the Municipal territory effected by project
10	Environmental Consent by MESPI
11	Evidence on type, safety, quality of solar/photovoltaic panels and certificate on recycling (TUV Certificate).
D	Financial Requirements
1	(In Our Case is PPA!)
E	Requirements for Final Authorization (Evidence/Documents to be attached for conversion of Preliminary Authorization into Final Authorization)
1	Agreement for Connection to the network, depending on the voltage level. (Final KOSTT consent)
3	Construction Permit issued in accordance with Law on Construction in the Republic of Kosovo.
4	Dynamic Plan of the project on execution of works
F	Fees and relevant taxes to be played while processing the documentation

A.7 Material provided Anisa Rrumbullaku

Each Balkan country has its own challenges and opportunities in the energy field. Based on your experience, what are the most common barriers to the wider adoption of solar in the Balkans today?

Lack of proper zoning for solar PV and wind generation projects i.e. identification of areas of high quality potential for development of energy (solar and wind projects) in terms of their technical, economic and land rights viability
Old transmission and grid infrastructure that does not guarantee safety in coping with large RES energy volumes.
Unpredictability of planning/regulatory process given transition to competitive support schemes e.g. the RES energy law of 2017 was currently being replaced by a new RES energy law.
Non-functional day-ahead market i.e. ALPEX (Albanian power exchange) is already established and it will couple the day-ahead and intraday electricity wholesale markets of Albania and Kosovo (this is not valid anymore – as ALPEX became operational just recently, 1 or 2 months ago)
Lack of skilled workforce required for new technologies from RES energy.

3. Which countries do you expect to demonstrate significant growth in terms of solar and other renewable energy installations between now and 2030? Is it mainly EU member states or, on the contrary, countries like Serbia and Albania?

Albania some of Europe's highest number of sunshine hours per year, which presents huge potential for development of solar PV for power generation;
Albania is driven by high necessity to diversify energy sources i.e. it depends on hydropower for almost all of domestically produced electricity and therefore highly depended on rainfall, forcing it to import 30 – 40% of its power. This has prompted government to implement concrete strategies to unlock Albania's solar and wind renewable resources;
Energy prices are driving more and more local and foreign private investor to tap into the renewable energy's growth potential in Albania;
Incentives in the RES energy sector through PPA/Feed in tariff (convertible into CfD once the day ahead market will be functional) have increased interest of prominent energy companies to enter the market (e.g. Voltalia), thus helping the promotion of more sustainable big projects;
Other incentives such as guaranteed priority access to the grid, proposed VAT exemptions for machinery and equipment imported to invest in solar and wind projects (once implement) with further stimulate growth;
There is already a large number for wind and solar power plants applications, including projects that do not benefit from government subsidies (feed in premium of CfD) which already signals good premises of future sector growth;
Self-producers of RES energy will contribute to the growth too; under the new draft RES energy law, self-producers are end-customers producing renewable energy (with an installation does not exceed 500 kW) mainly for their own consumption, with the right to generate, consume, store and sell the excess production of renewable energy, including through bilateral agreements with energy suppliers and traders; such producers can benefit from a compensation scheme based on a net billing methodology and a remuneration for electricity generated by their installations based on the price approved by the energy regulatory authority.

List of key permits for the development, construction and operation of a PV plant in Albania (without support measures)

Phase	No.	Activity/Procedure	Issuer/Responsibility	Duration of activity/procedure
Development	1.	Application for the development of the project	Project Owner	N/A
	2.	Early introduction to the public	Ministry of Infrastructure of Energy ("**MIE**")	15 calendar days
	3.	Preliminary Approval	MIE	45 calendar days following the submission of the complete request
	4.	Final Approval	**Albanian Council of Ministers** - for the Power Plant of the installed capacity of more than 2 MW, **MIE** - for Power Plants of the installed capacity until 2 MW.	20 calendric days following the submission of the complete request for final approval
	5.	Execution of Development Contract	Project Owner and MIE	N/A
	6.	Payment of Development Contract Guarantee (5% of the investment)	Project Owner	At the time of signing of the Development Contract with MIE.
	7.	Preparation of the: i) Project implementation program; ii) Environmental impact of the proposed project; iii) Technical characteristics of the photovoltaic system; iv) Prefeasibility study iv) location conditions, etc.	Project Owner (by engaging licensed entities)	Preparation of each of these projects takes a couple of months, practice differs.
	8.	Determination on whether environmental impact assessment study (EIAS) is required	Ministry of Environment (ME) or National Environment Agency (NEA).	N/A (no deadlines prescribed), practice differs.
	9.	Preparation of the EIAS	Project Owner (by engaging licensed entities or natural persons)	N/A (no deadlines prescribed)
	10.	EIAS approval	NEA - for Preliminary EIAS ME - for Detailed EIAS	**Preliminary EIAS** – up to 45 to75 calendar days following the submission of the complete request. **Detailed EIAS –** up to 120 calenar days following the submission of the complete request
	11.	Preparation of the project-technical documentation, consisting of: (i) conceptual solution; (ii) conceptual design; (iii) main design; (iv) design for performance of construction works; (v) as-built documentation	Project Owner (by engaging licensed entities)	N/A (no deadlines prescribed)
	12.	Acquisition of land rights for the PV plant site	Project Owner	N/A (no deadlines prescribed)
	13.	Development and Construction Permit for the PV plant	National Territory Council ("NTC").	**Development Permit** - 20 business days following the submission of the complete request. **Construction Permit** - For approval - around 55 business days following the submission of the complete request. - For issuance - Around 110 business days from approval until issuance of the construction permit, upon payment of the infrastructure impact tax.
	14.	Development and Construction Permit for the connection infrastructure	Local Authorities i.e. Municipality	**Development Permit** - 20 business days following the submission of complete application **Construction Permit** - Around 45 business days following submission of complete application

	15.	Grid Connection Approval (Transmission or Distribution Operator) and connection agreement	TSO or DSO	**TSO- 60** days following the submission of the complete request; **DSO - 20** business days following the submission of the complete request;
	16.	Notice on commencement of the construction works	Project Owner	Immediately after issuance of the construction permit, not later than 1 year from issuance.
	17.	Construction	Project Owner	According to the term provided in the final approval, development contract, construction permit.
Operation	**18.**	Use Permit	NTC or Local Authorities i.e. Municipality	Around 60 business days following the submission of the complete request
	19.	Connection to the grid	TSO; DSO	N/A (no deadlines prescribed)
	20.	Energy permit (production of energy)	Energy Regulatory Authority ("ERA")	Around 130 calendar days following the submission of the complete request