



# Renewable Energy Financing and Investment in Albania, Georgia, Kazakhstan and Serbia

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## ABBREVIATIONS AND ACRONYMS

AKBN	National Agency of Natural Resources of Albania
ALKOGAP	Albania-Kosovo gas pipeline project
CEER	Council of European Energy Regulators
CfD	Contract for difference
CoM	Covenant of Mayors
DANIDA	Danish International Development Agency
DCFTA	Deep and Comprehensive Free Trade Area
DIN	Serbian Dinar
DSO	Distribution System Operator
EAEU	Eurasian Economic Union
EAP	Eastern Partnership
EBRD	European Bank for Reconstruction and Development
EC	European Commission
ECT	Energy Community Treaty
EE	Energy Efficiency
EIA	Environmental impact assessment
EIB	European Investment Bank
EnCS	Energy Community Secretariat
ERE	Albanian Energy Regulatory Authority
ERP	Economic Reform Programme
EU	European Union
EUR	Euro
FiT	Feed-in tariff
GEL	Georgian Lari
GERE	UNECE Group of Experts on Renewable Energy
GGF	Green for Growth Fund
GHG	Greenhouse gas
GITA	Georgian Innovation and Technology Agency
GIZ	German Agency for International Cooperation
GoG	Government of Georgia
GSE	Georgian State Electrosystem
HPP	Hydro Power Plant
IAP	Ionian Adriatic Pipeline
IEA	International Energy Agency
IFC	International Finance Corporation
INSTAT	Institute of Statistic of Albania
IRENA	International Renewable Energy Agency
KESH	Albanian state-owned power utility Korporata Elektroenergjitike Shqiptare
KfW	German state-owned investment and development bank
KZT	Kazakhstani Tenge
LEK	Albanian Lek
MARD	Ministry of Agriculture and Rural Development of Albania
NDC	Nationally Determined Contributions
MIE	Ministry of Infrastructure and Energy of Albania
MoESD	Ministry of Economy and Sustainable Development of Georgia
MTE	Ministry of Tourism and Environment of Albania
NEA	National Environmental Agency of Albania
NECP	Integrated National Energy and Climate Plan

NEEAP	National Energy Efficiency Action Plan
NREAP	National Renewable Energy Action Plan
OSHEE	Albanian Electricity Distribution System Operator
OST	Albanian Transmission System Operator
PPA	Power Purchase Agreement
PV	Photovoltaic
RE	Renewable energy
RECG	Renewable Energy Coordination Group
RES	Renewable energy sources
SDG	Sustainable Development Goals
SECO	Swiss State Secretariat for Economic Affairs
SWH	Solar water heating
TAP	Trans Adriatic Pipeline
TPP	Thermal Power Plant
TSO	Transmission System Operator
UNIDO	United Nations Industrial Development Organization
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USD	United States Dollar
VAT	Value-added tax
WB	World Bank



## Executive Summary

The United Nations Economic Commission for Europe (UNECE) study on “Renewable Energy Financing and Investment in Albania, Georgia, Kazakhstan, and Serbia”, provides a comprehensive, up-to-date overview of financing mechanisms and investment activities in these selected four UNECE member States. It draws on information from national and regional sources to present the most up-to-date summary of renewable energy in the region, covering the status of renewable energy markets, industry, policy and regulatory frameworks.

Attracting investments represents a major challenge in these countries, even with numerous advanced support schemes and policies for renewable energy. The four countries lag in global development both technically and financially despite significant untapped renewable energy resources.

This paper is pointing out these and other key findings, issues and opportunities raised by the study, which helps in setting the vision for renewable energy playing a key role in the region.

### Regional overview

All four countries continue to progress in increasing renewable energy use. This progress includes creating the necessary regulatory framework and adopting targets, policies and regulations. Governments within the four countries share a variety of energy challenges, which could become drivers for renewable energy deployment as the countries embrace a more active approach through renewable energy policies.

Except for Kazakhstan, which is a net energy exporter, energy import dependency dominates in the other three countries. Energy intensity in the countries is high in the global context with continuing improvements, e.g., for Kazakhstan the energy intensity of Gross Domestic Product (GDP) dropped from 0.49 toe/thousand USD to 0.34 toe/thousand USD (in 2010 prices of GDP). Awareness and lack of understanding of renewable energy are additional obstacles to further development of renewables in the region. In May 2021, the union of mineworkers organized numerous strikes against the government that halted the construction of the 350 MW thermal power plant Kolubara B and plans to shut down the remaining thermal power plants in Serbia until 2050 because of the Clean Energy for all Europeans package. Policy debates and cooperation between all the relevant stakeholders, including the state, companies, unions, and employees, are needed. Overall, it remains a challenge to build sustainable and resilient energy systems that offer reliable and affordable energy to fuel the region’s future economic growth.

The share of renewable energy in total final energy consumption (SDG 7, Target 7.2) varies widely across the four countries. In 2019, Albania had the highest share with 33% of energy from renewable sources, it is followed by Georgia with 28% and Serbia with 20% and Kazakhstan with slightly more than 2% of renewable energy in the total final energy consumption.

All four countries are actively participating within various regional co-operation programmes. For example, the EU4Energy Phase II is an energy programme funded by the European Union and focused on the countries of the Eastern Partnership (EAP) and Central Asia including two countries covered by the study: Georgia and Kazakhstan. The EU4Energy Phase II Programme brings together the Energy Community Secretariat (EnCS), the Council of European Energy Regulators (CEER) and the International Energy Agency (IEA) to set up collaboration activities and aims to improve the quality of energy data and statistics, shapes regional policy-making discussions, strengthens legislative and regulatory frameworks and improves access to information in the partner countries. Albania, Georgia and Serbia, as the Contracting Party to the Energy Community Treaty, are part of the Renewable Energy

Coordination Group (RECG) which continues to organize biannual meetings, and which at the end of 2020 outlined the key six activities for the following period: implementation of the Renewable Energy Directive 2009/28/EC, setting 2030 targets, introduction of market-based support scheme, guarantees of origin, citizen's' participation in the development of the projects and horizontal and cross-cutting issues. UNECE and the International Renewable Energy Agency (IRENA) are ramping-up their activities to increase the renewable energy uptake by exploiting the untapped potential in these countries. Other donors and development banks are also implementing projects relevant to renewable energy (USAID, KfW, EBRD, EIB, UNDP, UNIDO, SECO, DANIDA and many others).

In all four selected countries the private sector investors developed most of the newly installed utility-scale renewable energy sources power plants. Most of these developers are foreign companies (Belgium Elicio built Malibunar – 8 MW and Alibunar - 42 MW wind power plants in Serbia, Italian Finterl Energia Group built Košava - 69 MW, Kula - 9.9 MW and La Pikolina - 6.6 MW wind power plants in Serbia, French company Voltalia recently won two auctions for 100 MW Spitalle and 140 MW Karavasta solar power plants in Albania) and very rarely local companies (such as Serbian company Naftna Industrija Srbije that developed the 102 MW wind power plant Pladinšte 1). National governments, international donors, and multilateral development banks typically back these public sector investments. Banks usually couple with international donors to provide the funding necessary for projects, often in the form of fiscal incentives or public financing (i.e., the Košava wind power plant developed in 2019 was co-funded by the group of foreign banks: Erste Group, Erste Bank Serbia, Unicredit Serbia, Zagrebačka Banka and the Development Bank of Austria). The EBRD very often promotes the scale-up of diversified energy sources through policy dialogue, technical assistance and investment. Funding institutions such as the Swiss State Secretariat for Economic Affairs (SECO) frequently provide grant funding to support the renewable energy auction.

### Renewable energy market and industry overview

During the recent years, the four countries continued to build on its substantial renewable energy resources, however new developments arising in the heating and cooling as along with transport sector lags behind. The most prominent growth was in the renewable power sector where solar and wind technologies are being implemented. All four countries with their emerging renewable energy markets continue to mature and commission utility-scale (mostly solar and wind) projects. Challenges to uptake renewable energy technologies remain, the targets are mostly not achieved because of various reasons. Serbia for example, will not reach the 2020 targets because three hydro power plants that were planned to be built (Srednja Drina river with about 100 MW, Ibar river with about 100 MW and Velika Morava river with about 150 MW) are delayed. The official statistics might also provide an incomplete picture: it is probable that more biomass is being used than what is presented in Serbian energy balance and there are numerous buildings using geothermal energy which is statistically not recognized (reliable statistical data for heat pumps using geothermal energy, solar heating or biomass consumption in households is not available). When it comes to heating and cooling as well as transport sector, these are still lagging far behind.

By the end of 2019 (official statistics for 2020 is not yet available) the total installed renewable power capacity in the four selected countries was more than 10.5 GW where Serbia leads with 3,491 MW, followed by Georgia with 3,337 MW, Albania with 2,591 MW and Kazakhstan with 1,050 MW of installed renewable energy capacity. The biggest growth happened in Kazakhstan where in 2014 there were only 26 facilities with 178 MW of installed capacity and in 2019 there are 90 renewable energy facilities with 1,050 MW. Kazakhstan also plans to have more than 3,000 MW installed capacity by 2025.

Hydropower continues to generate a large share of electricity in the four selected countries, most of these facilities were built before 1990. Both Albania and Georgia traditionally depend almost exclusively on hydropower for its electricity generation which makes both countries highly vulnerable to variable and unfavourable hydrological conditions, especially during the summer season. Results of the successful renewable energy auctions held in Kazakhstan in 2018 and 2019 are that 9 small-scale hydropower plans will be built with the total capacity of nearly 90 MW ranging from 2 MW to 26 MW with the average auction price of 30 EUR/MWh.

Solar photovoltaic (PV) power plants were showing a slow growth in Albania, from 0 to 15 MW in 2017-2019. As for Serbia and Georgia the growth was even smaller with only 3 MW installed in Georgia and 11 MW in Serbia. In Kazakhstan, however, the PV capacity increased significantly within the 2014-2019 period: from 5 MW to 542 MW with major solar power plant projects such as Burnoye SPP, Saran SPP and Nurgisa SPP (each of the three with 100 MW of installed capacity). The analysis of the prices proposed during auctions in 2018-2019 for solar power generation shows a significant reduction from the auction ceiling prices in Kazakhstan where the average auction price dropped from 43 EUR/MWh in 2018 to 26 EUR/MWh in 2019. Kazakhstan is also the only country with local capacity for producing solar PV modules.

A sizable wind resource potential is present in all four countries, with the largest resource in Kazakhstan. Serbia led in new capacity installations with a bit less than 500 MW of installed capacity from 2014 to 2019 and is followed by Kazakhstan with the growth from 53 MW in 2014 to 284 MW in 2019. Georgia has only one wind power plant with the installed capacity of 21 MW and Albania just recently started developing the WPP sector.

Geothermal energy has great potential in all four countries and is gaining increased attention from international developers. In the renewable heating sector, there is a possibility of using geothermal energy that could contribute to improving efficiency and introducing renewables in the district heating sector. The assessment of cost-effective potential for geothermal district heating requires a detailed mapping of resource data which is not yet done for the considered countries. None of the four countries uses geothermal energy for electricity generation even though there might be a certain potential. All analysed countries are deploying renewable heating and cooling technologies only modestly even though the potential is high. Albania is the most developed market for solar water heating in the Southeast Europe.

Selected countries have not done much regarding renewable energy in the transport sectors. Electric mobility promotion programs are emerging; however, this is still negligible. In Serbia for example, the share of renewable energy sources remains low with only 1.16% in 2018 while the target for 2020 was 10%.

### Policy landscape

All countries analysed in the report developed its primary legislation related to renewable energy sources and are slowly adopting the necessary secondary legislation (detailing legal, regulatory and financial mechanisms and technical rules) that will ensure the full implementation of renewable energy sources. Albania, Georgia and Serbia, as members of the Energy Community, are still aligning its legislation with the legal framework of the EU and their governments aim to establish clear and transparent responsibilities for the implementation of the EU *acquis*. The selected countries continue to adopt new policy measures that help to remove barriers for development, attract investment, foster energy security and increase the flexibility of power systems.

All four countries have submitted their first Nationally Determined Contributions (NDC) in 2016 and 2017, soon after The Paris Agreement was opened for signature, and thereby officially ratified the Paris Agreement. In 2020, UNDP Kazakhstan started the project that supports the Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan to improve its system of measuring, reporting and verification of greenhouse gases, include climate change adaptation measures in NDCs and raise awareness about the climate change issues.

The region still has room to improve policy making on renewable energy. For example, renewable energy technologies could address some of the trade-offs between water, energy and food production, bringing substantial benefits in all three sectors. The selected countries have the potential to leverage opportunities across several sectors (water, energy and food production) by developing its renewable energy potential, provided that adequate policies are in place. Overall, increasing the renewable energy share can reduce water requirements in power generation; boost water security by improving accessibility, affordability and safety, and contribute to food security objectives.

Official targets for renewable energy were defined in Albania, Serbia and Kazakhstan. Renewable energy targets for 2020 representing the participation of renewables in the energy mix were defined in Albania (38%) and Serbia (27%). In Kazakhstan the target is defined as a share of the renewable energy system in total electricity production by 2020 which is 3%. Due to its late accession to the Energy Community, Georgia adopted the National Renewable Energy Action Plans (NREAP) only at the end of 2019. The document contains a set of measures to promote energy, however, there are no obligatory 2020 targets. Within the framework of the NDC, Georgia became fully committed to an unconditional limiting target of 35% below 1990 level of its domestic total greenhouse gas emissions by 2030.

Policy makers in the selected countries continued to focus mainly on renewable power generation technologies. The support scheme for renewable energy in Albania is based on administratively set feed-in tariffs and contracts for difference, which are still to be introduced upon the establishment of the day-ahead market. In Serbia, the only existing support mechanism for renewable energy consists of administratively set feed-in tariffs. So far Serbia supported the construction of around 500 MW in various renewable energy capacities with additional 300 MW in the pipeline. A market-based support scheme is still not applied as in Kazakhstan where the auction mechanism was introduced at the end of 2017 to replace feed-in tariff measures. The successful 2018-2019 auction results show the effectiveness and timeliness of the transition from feed-in tariffs to the auction mechanism, following international best practice.

Licensing and permitting procedures need to be simplified and streamlined. There is no single administrative body established in any of the four selected countries. An electronic system for issuing, transfer and cancellation of Guarantees of Origin is being planned in Georgia, however it is not yet in place. Serbia had several simplification rounds for administrative procedures including a few updates of the investor's guide for renewable energy projects even though the licensing remains lengthy, and the single administrative body is not established. USAID recently funded the development of the Investor's guide to renewable energy projects in Kazakhstan which presents the step-by-step guidance for investors planning to develop renewable energy projects in Kazakhstan.

Policy support for renewable heating and cooling continues to lag support in the power sector. None of the four selected countries had an obligation for a percentage of share of renewable energy in the heating and cooling sector by 2020.

Policies to stimulate renewable energy in the transport sector are still missing and the support remains far below other sectors. Albania and Serbia have the renewable energy target for the transport sector

where Albania defined it within the National Energy Strategy as the biofuel target which represents share of biofuels versus total fuel consumption in the transport sector which is 10% until the year 2020. In the Energy Community member states Albania, Georgia and Serbia, provisions related to the sustainability of biofuels are still not transposed and the legal framework remains not fully compliant with Directive 2009/28/EC.

### Investment flows

International donors and development banks continue to be an important source of debt financing and grants for renewable energy projects in all four countries. In recent years, the four selected countries also managed to attract foreign investments for renewable energy projects, and this was mostly visible in Serbia with newly built wind power plants and Kazakhstan with both solar and wind power plants. Albania attracted foreign capital recently with the first two auction bidding rounds in 2018 and 2020 after which the construction of two utility-scale solar power plants developed by the French company Voltalia will start in 2021. The successful 2018-2019 auction results in Kazakhstan have made it possible to create competitive conditions, hereby attracting international renewable energy investors and reduce the cost of renewable energy generations.

The Green for Growth Fund (GGF) which is the first specialized fund for advancing renewable energy in Southeast Europe and the Caucasus provides refinancing to Financial Institutions to enhance their participation in the renewable energy sector. The GGF was initiated as a public-private partnership by Germany's KfW Development Bank and the European Investment Bank (EIB) in 2009. In 2020, the GGF approved a EUR 20 million loan to ProCredit Bank Georgia that will aim to help businesses and households' access to the dedicated financing for sustainable energy activities, especially during the COVID-19 crisis. Serbia's largest wind farm project worth EUR 300 million, Čibuk 1 (158 MW), was supported by the GGF as a B lender to the EBRD and IFC, with debt financing of EUR 18.35 million. The European Bank for Reconstruction and Development (EBRD) provided for the same wind farm project a senior loan of up to EUR 60 million with the remaining funding being provided by the IFC, other financial institutions and the Sponsors.

The EBRD will provide financing of up to USD 120 million for medium-sized renewable energy projects in Georgia. The projects under the Framework will encompass development, construction and operation of renewable energy generation projects in Georgia. The projects under the Framework will be instrumental to support the Government Strategy to foster low carbon generation, for covering the country's seasonal winter demand and for supporting private ownership in the energy sector. In 2020 EBRD backed the USD 140 million wind power plant project in Kazakhstan, Zhantas Wind-Power Station LLP, with a senior loan of up to USD 25.28 million in favour of the special purpose entity that is implementing the project. The project involves the construction and operation of a 100 MW wind farm, including 8.6 km of 110kV single circuit line connecting to the existing substation in south Kazakhstan.

The Asian Development Bank (ADB) also started supporting the renewable energy sector. In 2020 the ADB funded the technical assistance to support Kazakhstan in achieving renewable energy generation (wind and solar) and greenhouse gas reduction targets by establishing the capacity of the transmission system operator, Kazakhstan's Electricity Grid Operating Company (KEGOC) for planning and modelling the integration of variable power generation sources into the Kazakh power system. In 2019 the ADB has signed an agreement for USD 30.5 million loan to M-KAT Green, a special purpose vehicle created for the project, to build and operate a 100 MW solar power plant in the southeast of the country near the town of Shu in the Jambyl Region. ADB also expects to provide USD 3 billion in assistance to Kazakhstan in 2017-2021 to support the country's ambition to be the top 30 global economies by 2050.

United States Agency for International Development (USAID) contributes extensively to the activities in all four countries. The USAID Energy Program in Georgia is aimed at supporting the country's energy market development per Georgia's obligations under the Energy Community Treaty. The goal of this program is to enhance Georgia's energy security through the improved legal and regulatory framework and increased investments in the energy sector. Based on the regulations of the Republic of Kazakhstan the step-by-step guidance for investors planning to develop renewable energy projects in Kazakhstan has been developed by the USAID Power the Future Regional Programme in 2020.

Several other funding and development organizations and institutions such as Danish International Development Agency (DANIDA), State Secretariat for Economic Affairs (SECO), German Corporation for International Cooperation GmbH (GIZ) are also important players that are actively promoting implementation of sustainable energy systems In Albania, Georgia, Serbia and Kazakhstan.

In Southeast Europe, the Western Balkans Investment Framework (WBIF) continues to channel investment from several international donors and multilateral banks, including the European Commission Instrument for Pre-Accession (IPA), the Council of Europe Development Bank (CEB), the EBRD, the EIB, Germany's KfW, World Bank and The French Development Agency (AFD). The WBIF provides EUR 600 million support to socio-economic development and the EU accession across the Western Balkans through the provision of finance and technical assistance for strategic investments, particularly in infrastructure, renewable energy, energy efficiency and private sector development.

The Climate Investment Fund (CIF) is a climate finance source that can be leveraged for renewable energy investments within the four countries. The Global Environment Facility (GEF) with the USD 4.5 million grant supported the promotion of the private-sector investment in large and small-scale renewable energy to achieve Kazakhstan's 2030 renewable energy targets already in 2016. The Green Climate Fund (GCF) which supports the developing countries to raise and realize their Nationally Determined Contributions (NDC) ambitions towards low-emissions, climate-resilient pathways also support various projects across the four countries. GCF-EBRD Kazakhstan Renewable Framework project is one of the successful examples where the EBRD proposes to the GCF to implement an investment framework programme with a 5-year duration leading to the total investments of USD 550 million from the EBRD, private sector investors, other financial institutions along with the proposed investment from the GCF.

## Conclusions

The four selected countries are gradually moving towards more sustainable energy systems. Even though the official statistics for 2020 is not yet available, most probably none of the four countries has reached its 2020 targets. In the power sector, there is certain progress with the focus on hydro, wind and solar energy systems, however, still, a lot needs to be done to boost renewable energy investments. In South-Eastern Europe, Albania and Serbia have the potential for cost-competitive deployment of solar and wind power generation. However, renewable energy is being challenged politically and financially, especially having in mind the cost of government support policies. In the heating sector, both Albania and Serbia could expand the usage of solar water heating system, geothermal energy as well as deployment of efficient biomass systems. Integrating renewable energy into the design of projects with multiple benefits could expand the opportunities for financing from different sectors (e.g. water, agriculture) and from cross-cutting sources, e.g. related to climate financing. Furthermore, cross-border cooperation may provide opportunities for regional projects and upscaling. In Serbia and Albania such opportunities have emerged in nexus (cross-sectoral) projects, linking also to water cooperation, and have been highlighted as possible nexus investments. In the Caucasus, Georgia is moving slowly from hydropower to other renewable energy sources with only

one 21 MW wind power plant running and few minor solar power plants. In Central Asia, Kazakhstan, a country with by far the largest potential for renewable energy deployment due to its size, there are plans to install numerous renewable utility-scale power generation projects, based on government support combined with financial mechanisms of various development banks. Most of the investments in all four countries are still driven by international donors and development banks which are, jointly with foreign private companies, developing and installing new renewable energy capacities.

## Introduction

The major aim of the United Nations Economic Commission for Europe (UNECE) is to promote pan-European economic integration among its 56 member states. The UNECE's work on sustainable energy is designed to improve access to affordable and clean energy for all, and to help reduce greenhouse gas (GHG) emissions and carbon footprint of the regional energy sectors. The UNECE region is considered to have great potential for renewable energy deployments. Some UNECE countries have developed renewable energy markets while other countries can substantially increase their market environment and develop infrastructure for renewable energy deployment. The uptake of renewable energy deployment is hampered by a number of issues, such as lack of market liberalisation, inadequate standards and regulatory frameworks, existing fossil-fuel consumption subsidies, absence of public acceptance and insufficient knowledge about the application potential of renewable energy resources and their integration into existing energy systems.

The overall objective of the following study is to provide an overview and analysis of renewable energy financing mechanisms and key actors as well as the status of investments in four selected UNECE countries - Albania, Georgia, Kazakhstan and Serbia. The information on the current state of renewable energy presented in the study is based on desk research and interviews with UNECE Group of Experts on Renewable Energy (GERE) members. The study presents examples of best practices in renewable energy investments for each of these countries. The study also includes analysis of the status of renewable energy and provides examples of renewable energy investments. The document provides an overview of national targets, policies and programmes that support renewable energy investments with a view to enabling cost-effective deployment of renewable energy within future energy systems.

The study also supports the countries of the region as they work to attain the objectives of the 2030 Agenda for Sustainable Development and identify innovative directions for a sustainable recovery from the current pandemic crisis and the creation of new job opportunities. The findings of the study provide contribution to the future work of the GERE. It provides policymakers with information about how they can support the transition to a more sustainable energy that can also be integrated into the design of projects with multiple benefits combining different sectors such as water or agriculture. It will also help achieve the United Nations Sustainable Development Goals (SDGs) and will support climate change adaptation and mitigation by reducing greenhouse gas emissions.

The report is divided into four chapters. The first chapter introduce and provide an overview of the study. The second chapter presents an overview of the status of renewable energy in four selected countries where each country. Each country is divided into subchapters which are dedicated to status of renewable energy systems, targets, jobs created, policy instruments and programmes, main financing mechanisms and communication activities. The third chapter provides an overview of recommendations to key issues and bottlenecks in financing renewable energy investments. The last chapter focuses on conclusions for successful energy transition.



## Analysis of the status of renewable energy

All the four countries presented in the report have made a solid progress in the past decade, both in improving the security of its energy supply and in their transition to more sustainable and cleaner energy system. The energy sector has been an important component of the overall economic policy focused on creating liberalised economic environment through reduction and simplification of administrative procedures, privatisation, simplification and deregulation.

There are still some uncertainties about the direction and speed the energy transition will take in the four selected countries because of the absence of structured energy transition plans (Table 0-1). Such uncertainties are also discouraging new market participants and investors that are looking for more predictability. This is why the main task of all four countries should be to agree and clearly define the decarbonization pathways towards achieving 2030 targets and if possible, net zero emissions by 2050.

Table 0-1 Basic energy statistics and 2020 targets comparison table

	Total primary energy supply [ktoe]	Final energy consumption [ktoe]	Baseline Year (2009)	Share of Energy from Renewable Sources (2019)	Target share of energy from RES in 2020	Total Capacities of Renewable Energy [MW] (2019)
Albania	2,340.0	2,067.1	31%	36.7% (Eurostat)	38%	2,591
Georgia	5,101.0	4,176.4	n.a.	28% (Geostat)	n.a.	3,337
Kazakhstan	73,148.0	45,510.0	n.a.	2.3% (stat.gov.kz)	3%	1,050
Serbia	15,277.9	8,361.0	21%	21.4% (Eurostat)	27%	3,491

Albania, Serbia and Georgia are expected to adopt the Energy Community Decarbonisation Roadmap and the Clean Energy Package by the Energy Community Ministerial Council on 25 November 2021 which will bring predictability and set the legal basis for decarbonisation on the Energy Community level, starting with the adoption of 2030 targets and National Energy and Climate Plans (NECP). Kazakhstan on the other hand developed its Concept on Transition towards Green Economy until 2050 that was adopted with the ambitious goal of 2050 generation mix comprising 50% alternative energy sources that include gas, nuclear and renewable energy. Because of numerous renewable energy projects that were recently successfully implemented in Kazakhstan, the 2050 targets will surely become more ambitious in terms of renewable energy systems integration.

In the following chapters the overview of the energy sector, renewable energy financing mechanisms, key actors, status of investments, is given for the following countries: Albania, Georgia, Kazakhstan and Serbia.

### 1.1. Albania

#### 1.1.1. Status

Albania has signed the Paris Agreement on the 22<sup>nd</sup> of April 2016 in New York, entering in the new era of the climate international policy process. Prior to this, Albania also joined the United Nations Framework Convention on Climate Change (UNFCCC) in 1995, and the Kyoto Protocol in 2005. Albania's energy consumption per capita is very low and this indicates the low level of the overall economic activity as well as modest levels of comfort in the household and service sectors. Albanian industry had been oriented towards energy intensive industries such as mining and metallurgy, and energy prices were kept at relatively low levels so the energy intensity (ratio of primary energy supply for a particular year and GDP produced in the same year) of Albania is very high. Based on the Albanian

Energy Balance, in 2019 the share of imported energy as a percentage of the gross inland consumption was nearly 70% which is very high, and it affects the security of supply. Domestic energy sources have continuously declined during last 30 years with the self-sufficiency of primary energy sources declining from 97% in 1990 to approximately 41% in 2016. The electricity market is under transition from centrally planned to the market-based system. Albania imports electricity from neighbouring countries, however in the last ten years imports dropped because of the increase in domestic power generation and reduction of technical and non-technical losses (from 45% in 2013 to 22% in 2019) in the distribution system.

Albania, as a predominantly mountainous country with eighth large rivers formed by numerous rivers and streams and the average height of 700m above the sea level, traditionally depends almost exclusively on hydropower for its electricity generation. This dependency can be perceived as a positive contribution to decarbonize the electricity sector, however it also makes the sector highly vulnerable to variable and unfavourable hydrological conditions, especially during the summer season. For this reason, Albania is a net importer of electricity and future sustainability of its power supply is one of the countries' key challenges. The total installed power capacity of all the hydropower plants was 2,576 MW (Figure 0-1) at the end of 2019. Various studies show that this represents almost half of countries' hydropower potential and future expansion of hydropower capacity is possible mainly along the Drini, Mati, Vjosa, Devolli and Bistrica rivers.

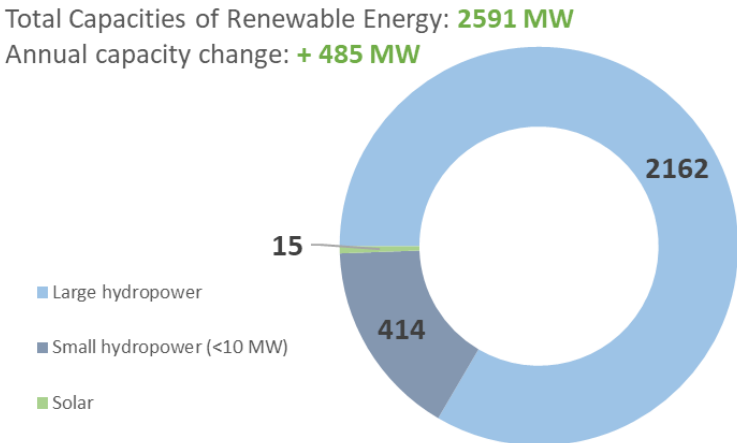


Figure 0-1 Total Capacities of Renewable Energy 2019 in Albania (source: Energy Community Secretariat)

The only thermal powerplant, Vlore TPP, is not yet operational. Albanian state-owned power utility (KESH) started building the powerplant almost two decades ago with the support of the World Bank (WB), The European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB) and the plant was designed as a combined cycle generation facility with the base load capacity of 97 MW. In March 2021, the United States of America and the Albania jointly signed the memorandum of cooperation for the import of liquefied natural gas (LNG) from America to Albania. The agreement also includes the revival of the idled Vlore TPP by feeding it with gas, the construction of a new gasification terminal and the distribution of LNG, transforming Vlore into a regional hub for liquefied gas. Besides the LNG terminal, the Gas Development Master Plan for Albania from 2017 [1] is focused on linking Albania with the international gas networks (TAP, IAP and ALKOGAP) and further gasification of the energy sector to diversify and increase energy security of supply. The first gas transmission system operator (TAP AG) was certified under the Third Energy Package procedures and this laid the groundwork for development of the gas market via the TAP. The second gas transmission system operator Albgas was also certified by Energy Regulatory Entity (ERE) in 2017.

Albania’s state-owned, vertically integrated oil company Albpetrol estimates Albania’s proved oil reserves at roughly 220 million barrels and natural gas reserves at approximately 5.7 billion m<sup>3</sup> gas. Albania today has two government agencies overseeing the oil and gas sector. Albpetrol is financed by the overriding royalties or share of profit it obtains from private oil and gas companies which are more the functions of the government agencies, rather than Albpetrol. Currently, there are nine companies holding the Production Sharing Agreements (PSA) with the state-owned oil company for the development and production in the existing oil fields. The other players in the oil sector are predominantly small private companies that have obtained the rights over existing oil and gas fields as well as new exploration and production.

Based on the Albanian Energy Balance published annually by The Institute of Statistics (INSTAT), Albania’s total primary energy production in 2019 was 1,727 ktoe (Figure 0-2) being one of the lowest in last ten years and the gross inland consumption was 2,340 ktoe which is the third highest in last fifteen years and same goes for final energy consumption which is shown in Figure 0-3. Albania’s primary energy supply is dominated by oil, hydropower and imported electricity. Transport sector consumes most of the final energy (40% in 2018) and is followed by households (24% in 2018) and Industry (20% in 2018). The three dominant final energy fuels are crude oil, electricity and fuel wood.

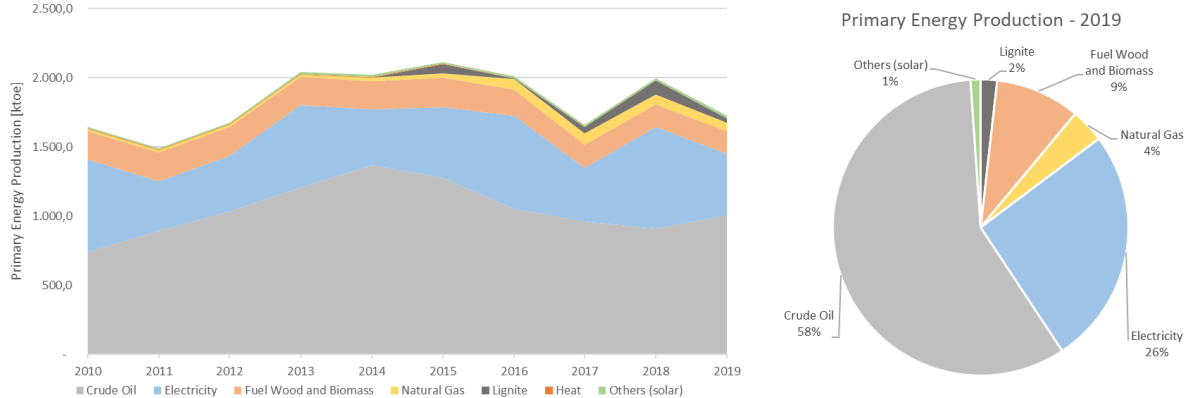


Figure 0-2 Primary Energy Production (ktoe)

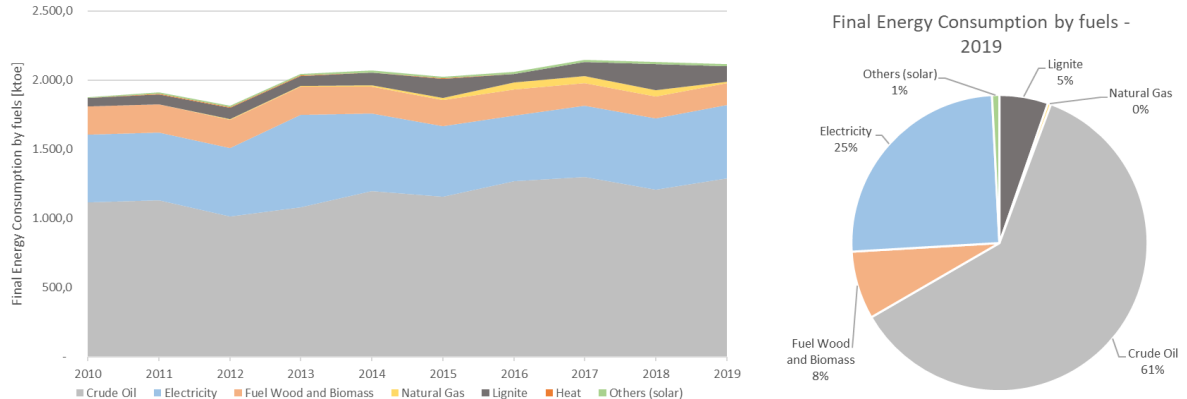


Figure 0-3 Final Energy Consumption by fuels (ktoe)

During the 2019, a total of 36 power plants were added to the power system with a total installed capacity of 74.3 MW and a total production of 83,158 MWh. The total production in 2019 was around 5.2 TWh and a bit less than 5.3 TWh in 2020 (decrease of about 40% compared to 2018) and the import of electricity has been around 2.4 TWh (Figure 0-4). Nearly 57% of the electricity output was generated

by the state-owned power utility KESH and the remaining 43% was generated by the private concession plants. During 2019, there was an increase in the renewable electricity production to 23 GWh from 8 photovoltaic powerplants with the total installed capacity of about 15 MW. The demand for electricity in 2019 reached the 7,612 GWh with a slight decrease in electricity consumption by 26.8 GWh compared to 2018.

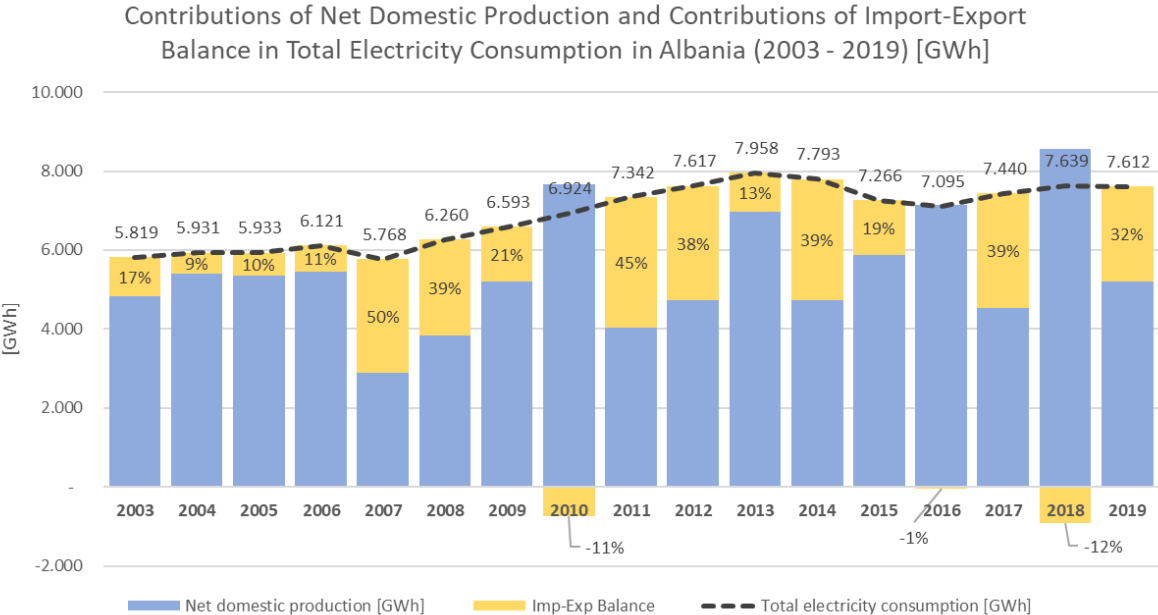


Figure 0-4 Net historical domestic production, contributions of import-export balance and total electricity consumption in Albania for the period 2003 - 2019

Energy security is becoming a critical concern in Albania because of high energy imports and electricity sector fully dependant on hydrological condition which are strongly affected by the ongoing climate change. Besides imports being the only solution to the uninterrupted power supply, dependency on imports also increases the financial burden for the state-owned power generation company. The position paper on Energy and Climate Planning Albania 2030 [2] stresses out that in 2019, drought-triggered electricity imports cost by EUR 209 million and put the power utility KESH and Albanian DSO OSHEE into severe financial difficulty. The only solution to all the mentioned problems is that the energy system needs to be more diversified and more efficient. The improvement of the energy sector is the vital priority of any government and stressed out as the fundamental issue of Economic Reform Programmes (ERP) that all EU candidate countries and potential candidates prepare every year. Some efforts are already taken so the power line interconnecting Albania and Kosovo has become

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### *BOX 1 - Albania's big solar power project without subsidies*

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Besides successful renewable energy auctions which boosted the solar power market of Albania, the legal reforms and rapid drop in equipment costs over the past decade enabled the development **solar power projects on a fully commercial basis**. The Ministry of Infrastructure and Energy announced in June 2021 that it accepted the application from telecommunications operator Info-Telecom which intends to build a 50 MW photovoltaic system without any subsidies in Libofshë.

In the first quarter of 2021 the ministry already issued installation licenses for two solar power plants of 50 MW each (Blue 1 and Blue 2) to domestic firms Blessed Investment and Matrix Konstruksion. Projects are not subject to subsidies nor concession agreements and their output will be sold on the market. Two powerplants will however need to pay royalty proceeds to the ministry in electricity or money equal to 2% of annual production. Also, they must sell a part of the production to the public supplier.

Expected time for the construction and commissioning of solar parks is 50 months from the receipt of the construction permit.

operational and the share of non-technical losses in electricity consumption was maintained at only 6% during the three first quarters of the 2020 [3].

The recent Economic Reform Programme report [3] identifies the areas where there are the most significant key obstacles and it also addresses the negative impact on the economy due to the COVID-19 pandemic and the November 2019 earthquake. The first two reform measures are related to energy market reform where the first measure explains the need for further liberalisation of the energy market and the second is about diversification of the energy sources through the promotion of the renewable energy sources and energy efficiency improvements. The first reform aims at unbundling of the energy distribution and supply which is in line with the obligation of the EU Third Energy Package [4] and Albanian's own energy strategy and this must be fulfilled in 2021. The second structural reform measure is aiming at the diversification of energy sources which was rolled out and the key action is to promote the use of renewable energy sources other than hydropower.

#### 1.1.2. Targets

**Energy strategy for Albania – Enhancing Capacity for Low Emission Development Strategies (EC-LEDS)** was published in January 2018 and it provided the vision of Albanian energy sector for the year 2030. The energy strategy [5] provides the key information on how to develop the domestic energy sources that will lead to a regional integrated and diversified energy system based on market principles, that is able to meet demand for energy and for sustainable development of the economy, ensuring security and quality of supply, safety, environmental protection and climate action, and increase the welfare at minimum social cost. The document also represents a synthesis of detailed energy sector analysis and cross-sectoral strategic and planning documents.

The analysis of the future development pathways for Albanian energy sector was performed using the Albania-LEAP model, a tool used also previously by the Albanian Government and commonly used by other countries in the region and globally. The model was calibrated to the 2014 energy balance and

extended to 2030 for the purposes of the analysis (Figure 0-5). The **Baseline** scenario represents the business-as-usual approach to the energy sector, the **Energy efficient** scenario includes 14 specific supply and demand side energy efficiency measures which are based on Albania’s commitments under the ECT, the 2015 law on Energy Efficiency (No. 124) and the new Law on Energy Performance of Buildings. The **Renewable Energy** scenario is based on Albania’s obligations as a Contracting Party to the ECT and it incorporates Albania’s NREAP which calls for increase of renewables to 38% of the final energy consumption by 2020. The **Natural Gas Promotion** scenario calculates how much natural gas could penetrate in the different demand sectors as well as power generation.

The Figure 0-5 also presents the projection of the GDP growth in Albania for the period 2014-2030. Lines with markers are presenting the relevant data which was published by the Eurostat and the INSTAT. The Figure 0-5 clearly shows that there are certain discrepancies between the numbers from the energy strategy pathways model and the real numbers from the relevant statistical organisations (marked with yellow and blue markers). The figure shows that the GDP grew much faster and that the final energy consumption grows much slower than predicted in the energy strategy model. The COVID-19 outbreak negatively affected Albanian economy and GDP dropped significantly in 2020 so the growth might get back to the modelled trends.

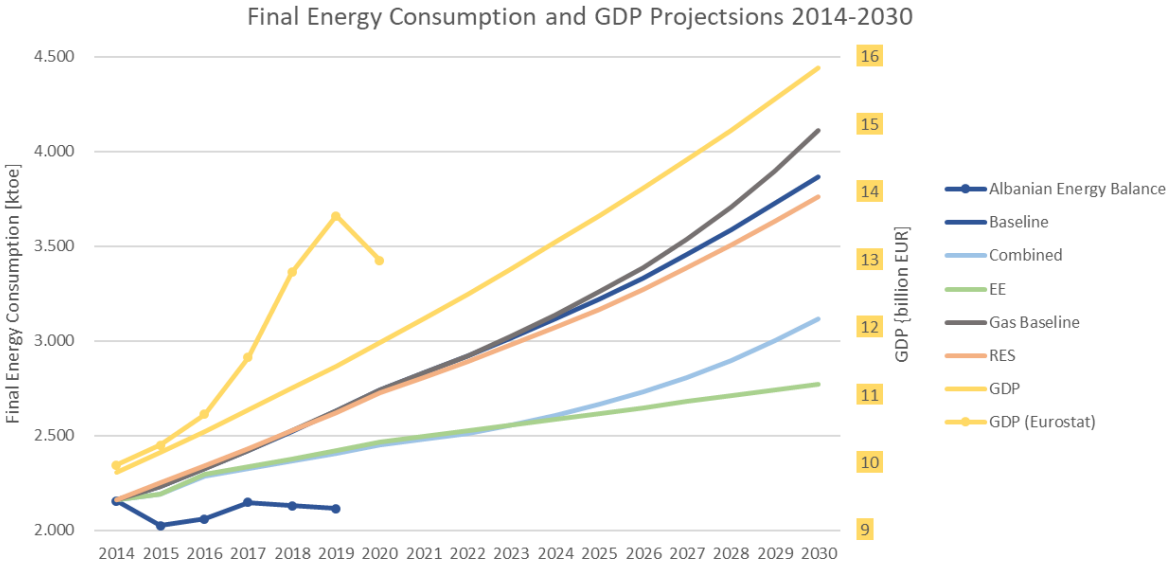


Figure 0-5 Final Energy Consumption and GDP Projections 2014-2030 (incl. real final energy consumption and GDP from 2014-2020)

The recommended development scenario is based on the implementation of all the measures from the EE, RES and Albania-Kosovo electricity market coupling scenario as well as the power and industry sector components of the Natural Gas Promotion scenario (residential and commercial customers will not use gas). The following results are planned to be achieved by the recommended development scenario:

- Potential to reduce the energy imports by 32% compared to the Baseline scenario
- Potential to reach the RES target past 2020 by including the gas infrastructure investment to serve the power and industry sectors and not at the middle terms to the residential and commercial customers
- Potential to reduce the final energy demand by 19.4% compared to the Baseline scenario
- Potential to reduce the GHG emissions by 28% compared to the Baseline scenario
- Potential to reduce the electricity generation requirements by at least 31% and

- Potential that natural gas to penetrate up to 19.81% of the total primary energy source by 2030
- Potential to reduce the energy intensity of GDP by 18%

Reporting, monitoring and evaluation analysis are essential for an efficient and timely implementation of the National Energy Strategy. The implementation of the strategy will be monitored through a set of thirteen monitoring indicators presented in the Table 0-2, which includes the baseline values (for the year 2015), short-term goals (2020), medium-term goals (2025) and long-term goals (2030). Ministry of Energy and Industry together with ERE, AKBN, EE Agency are responsible for monitoring and providing an efficient implementation of the energy strategy for all respective sectors. While the responsibility for the overall implementation oversight rests with Ministry of Energy and Industry, strategy implementation involves almost all line ministries, central government institutions and local government.

Table 0-2 Main Energy Indicators and Targets for the National Energy Strategy (source: [5])

Indicator	Baseline Value 2015	Short-term goals 2020	Medium-term goals 2025	Long-term goals 2030	Responsible institution
Reduction of transmission technical electricity losses	2.20%	2.00%	1.80%	1.70%	MIE/ERE/OST
Reduction of distribution non-technical electricity losses	14.04%	8.00%	6.00%	4.00%	MIE/ERE/OSHEE
Reduction of distribution technical electricity losses	14.00%	9.00%	7.00%	6.00%	MIE/ERE/OSHEE
Increasing rate of electricity collection	90%	92%	95%	98%	MIE/ERE/OSHEE
Opening of electricity market	35%	40%	100%	100%	MIE/ERE
Self-sufficiency of domestic primary energy sources vs. total primary energy supply (%)	47.47%	50.37%	52.31%	52.40%	MIE/AKBN
Imports of energy sources vs. total primary energy supply (%)	52.53%	49.63	47.69%	47.60%	ME/AKBN
Energy Efficiency Target (%)	0.2%	6.8%	10%	15%	MIE/AEE
<b>Utilization of renewable energy in TPES (RES Target) (%)</b>	<b>32.50%</b>	<b>38.00%</b>	<b>40.50%</b>	<b>42.00%</b>	<b>MIE/AKBN</b>
Biofuel Targets as share of biofuels versus total fuel consumption in transport sector (%)	3.55%	10%	10%	10%	MIE/AKBN
CO <sub>2</sub> emission as percentage reduction versus baseline (%)	0%	0%	5.57%	11.5%	ME/MIE/AKBN
Natural Gas Penetration (ktoe) versus total primary energy supply	0.36%	0.37%	5.10%	19.81%	MIE/AKBN

The activities planned for 2021-2023, which are emphasized in the **Economic Reform Programme** report [3], are quite ambitious and are aiming to integrate wind, solar and biomass energy projects into the existing power generation capacity mix.

In line with the EU legislation and the Energy Community Treaty, the first **Albanian Renewable Energy Source Action Plan** was adopted by the Governmental Decree no.27, dated 20<sup>th</sup> of January 2016 and was revised in 2018. The revised version, **The National Action Plan for Renewable Energy Sources in**

**Albania (Revised) 2018-2020** [6], aims to increase the installed renewable electricity generation capacities to 738 MW to achieve the target on renewable energy consumption of 38% in 2020 (Figure 0-6). The largest share is planned to come from photovoltaics (490 MW), wind power plants (150 MW), hydropower (57 MW) and waste (41 MW). Even though the power sector is almost completely renewable, additional efforts are needed in the heating and cooling as well as in the transport sector to reach the overall 2020 renewable energy targets. In the heating and cooling sector, no renewable energy deployment targets were set. In the transport sector, the revised version of the action plan aimed for 3% of the energy consumption to be supplied by the locally sourced biofuels (20 ktoe in 2020).

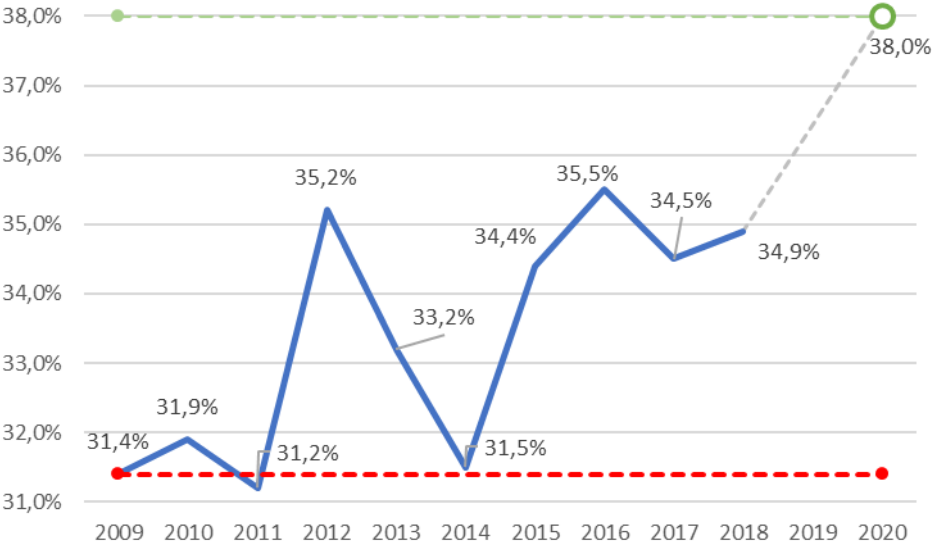


Figure 0-6 Shares of Energy from Renewable Energy Sources in Albania (source: EUROSTAT and ECS [7])

Reaching the targeted 38% of renewable energy is highly dependent on the hydrology. The planned capacities that were supposed to be built were evidently unrealistic and the contracts from the solar PV auction that was held already in 2018 has never been signed.

As described in the ERP 2021-2023, so far, eight photovoltaic plants are operating (about 15 MW), and another ten PV plants are in the process of obtaining authorisation (Figure 0-1). In 2020 Albania held its second PV auction, which resulted in a price of 24.89 EUR/MWh offered by the French company



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### *BOX 2 - Albania's first floating PV plant (water-energy nexus)*

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The 0.5 MWp **floating PV plant**, built by the Norwegian energy company Statkraft, started commercial operational in June 2021. The project is expected to continue its second implementation phase during the second half of 2021, when 1.5 MWp of floating units will be installed by the Statkraft in cooperation with Norwegian supplier Ocean Sun. The project is placed at the Banja reservoir in Albania, where Statkraft is operating its 72 MW Banja hydropower plant.

The technology developed by Ocean Sun consist of a floating ring and the hydro-elastic membrane which is only a few milometers tick and can easily withstand the weight of the solar panels and of personnel carrying out installation or maintenance tasks. The cooling of the panels from the water below and the large area of the membrane is what makes this concept unique.

The first unit that comprises of 1,536 solar panels has an installed capacity of 0.5 MWp and it covers almost 4,000 m<sup>2</sup>. For research purposes additional 160 equal panes have been placed on land to compare and document the cooling effect on the floating panels which should be much better for the floating PV plant because of the direct heat conduction through the membrane.

PV projects up to 2 MW in size capacity are eligible for a feed-in tariff under Albanian regulations so the project owner will likely sell power to the grid under a regulated tariff.

Volitalia. The construction of a 140 MW PV plant in Karavasta (Lushnjë-Fier) was signed in May 2020 and construction is expected to start in 2021. A tender for a 100 MW PV plant in Spitalla region was announced on 2 December 2020 and call for tender for wind farms will be launched in 2021. The auction was designed to convert the fixed purchase price awarded to the producer into a contract for difference once a day-ahead market is operational.

Even though exact numbers are still missing for the year 2020, statistics as well as various reports show that Albania has unfortunately completely missed its targets for renewables in all three areas, electricity, transport and heating and cooling for 2020. It is also clear that in Albania the reforms need to be accelerated if the country plans to come close to reaching any 2030 targets presented in the Table 0-2.

Albania is encouraged to prepare the National Energy and Climate Plan (NECP) by the Energy Community and the NECP is now being developed. The document will cover a detailed ten-year planning period starting from 2021 to 2030. Integrated reporting on the progress of implementation will take place every two years. NECP will cover the following areas: greenhouse gas (GHG) reductions, renewables, energy efficiency, interconnections and research and innovation. The drafted version of the NECP is submitted to the Energy Community Secretariat, however the official draft is still not publicly available.

### 1.1.3. Jobs created

Albania's energy landscape is evolving fast as Government has led initiatives to diversify to other renewable energy sources than hydropower. With technological advancement and innovation playing a key role in developing energy policies, it is to be seen what measures the Government of Albania plans in the long term. Considering the threat of climate change and structural shift in the post covid-19 economy, the production and consumption pattern of energy in Albania will have to transition towards adopting sustainable measures. This will require capacity building, developing local skillsets, change in labour policy and developing competency. Adequately skilled and locally available renewable energy experts working in various parts of the renewable energy value chain are crucial in supporting the transition that is inevitably going to happen in Albania.

Women participation can play a central role in this transition. The government of Albania has already rolled out several policies and strategy to support participant:

- The National Strategy for Gender Equality and National Action Plan covering 2016-2020 [8], approved in October 2016 by Council of Ministers
- Policy focus on skills under the umbrella of the Strategy for Employment and Skills 2014-2020 [9]

Initiatives by EBRD [10] to promote gender equality in Albania will see more women participating in the renewable energy sector especially in the northern region, as women participation in the labour force is very low. Central issues regarding investment, finance, employment, and services are to be made more accessible to encourage women participation.

However, there are several challenges which need to be addressed, for example, the discriminatory traditions and social norms, especially in rural areas. In most rural area, women are not aware of their rights despite of the civil code which protects women's property ownership, yet the social norms and traditions restricts women to take initiative. The banks and financial institutions are hesitant to provide loans for women as most women do not own property.

Establishing institutional support and promoting policies on restructuring financial grant schemes, development of educational and skill building programs through vocational training and promoting participation in all sectors of economy, especially renewable energy, can support the economic gender participation. However, in addition providing childcare facilities, maternity benefits for working women will offer support to women entrepreneurs and this is one of the learning from the COVID-19 pandemic.

### 1.1.4. Policy instruments and programmes

Albania ratified the Energy Charter Treaty and the Protocol of Energy Efficiency and Related Environmental Aspects (PEEREA) in 1997, which committed the government to draft and implement policies for improving energy efficiency and reduction of the negative environmental effects of the energy system.

In April 2006, The Energy Community Treaty (ECT) was approved by the Albanian Parliament (Law No. 9501, dated 3<sup>rd</sup> of April 2006). The ECT provides a legal framework for convergence with the EU's energy acquis and a binding commitment to implement the relevant EU Acquis on energy, environment, RES and competition and to promotion of investments, statistics, and social policy. Albania is obliged to transpose and implement the EU Directive 2009/28/EC "On the promotion of the use of energy from renewable sources". The Annual implementation report from the November 2020

[7] presents the status of alignment of the Albanian Energy Sector with the EU directives and the renewable energy implementation is presented in the table below (Table 0-3).

Table 0-3 Renewable Energy Implementation in Albania (source: Energy Community Secretariat [7])

Renewable Energy Indicators	Transposition Assessment*	Implementation status*	Description
National Renewable Energy Action Plan	✓	70%	Albania submitted its NREAP, amendments as well as all three Progress Reports on implementation of the Directive to the Secretariat. With a share of 34.86% of renewable energy in its energy mix in 2018, Albania is in a slight delay compared to the planned trajectory of 35.6% for 2017 - 2018.
Quality of support schemes	~	72%	The support scheme for renewable energy in Albania is, as prescribed by law, based on administratively set feed-in tariffs and contracts for difference, which are still to be introduced upon the establishment of a day-ahead market. So far, two solar PV auctions were conducted for which power purchase agreements are yet to be signed.
Grid integration	✓	55%	Renewable energy producers have priority access to the grid. They are balance responsible, with the exemption of existing producers, which are exempted from balancing responsibility until the balancing market is established, but no later than the end of 2022.
Administrative procedures and guarantees of origin	~	50%	The administrative procedures for authorization, permitting and licensing are not streamlined and require simplification, including the designation of a one-stop shop. An electronic system for issuing, transfer and cancellation of guarantees of origin is not yet in place.
Renewable energy in transport	✗	0%	Provisions related to the sustainability of biofuels are still not transposed and the legal framework remains completely non-compliant with Directive 2009/28/EC.

\* Methodology was developed by the Energy Community Secretariat

The Albanian Government has worked to align its legislation with the legal framework of the EU, and it aims to establish the clear and transparent responsibilities for the implementation of the EU Acquis. The relevant primary legislation includes the Power Sector Law No. 43/2015, the Natural Gas Sector Law No. 102/2015, the Energy Efficiency Law No. 124/2015, the Renewable Energy Sources Law No. 8/2017, the Law on information of the Consumption of Energy and Other Resources by Energy-Related Products No. 68/2012, the Law on Energy Performance of Buildings No. 116/2016 and the Law on biofuels in transport (2008).

Albania should focus on adopting the necessary secondary legislation because in many cases it is the adoption of the secondary legislation that ensures actual implementation. There is certain progress made in conducting the first auctions, however the MIE should assure the clarity and predictability of the contract for difference scheme which was introduced by the Renewable Energy Sources Law. The secondary act from December 2019 enables the guarantees of origin as required by the Renewable energy Law, however the electronic system for the issue, transfer and cancelation of guarantees of

origin compatible with the standardized European Energy Certificate System has not been implemented yet. The Energy Community Secretariat regularly updates the status of the secondary legislation adoption for each member state on the Implementation section of their webpage. The newest update from December 2020 for the secondary legislation related to the Law on Renewable Energy Sources No. 07/2017 is presented in the Table 0-4.

Table 0-4 Renewable energy secondary legislation status for Albania (last update 30.11.2020, source: Energy Community Secretariat [11])

Legal act	Primary legal basis	Bodies in charge		Adoption / validity status	Comments /Compliance status
		Adoption /Approval	Drafting		
National Action Plan for Renewable Energy Sources	Article 5	The Council of Ministers	Ministry of Infrastructure and Energy	Adopted / <a href="#">No. 27</a> , 20.1.2016 Updated / No. 179, 28.3.2018 Updated <a href="#">No. 580</a> , 28.8.2019	
Certification schemes and the relevant certification criteria for installers of small-scale biomass furnaces and stoves, solar photovoltaic and solar thermal systems, shallow geothermal systems and heat pumps	Article 6	The Council of Ministers	Ministry responsible for Urban Development	not adopted / Deadline: February 2018	
Decision on the adoption of supportive measures to promote the use of electricity from renewable sources of sun and wind, as well as the procedures for the selection of projects for their benefit	Article 8	The Council of Ministers	Ministry of Infrastructure and Energy	Adopted / No. 349, 12.6.2018, Amended with the <a href="#">DCM No 858</a> , 04.11.2020	
Decision on the approval of the methodology for determining the purchase price of electricity generated from small renewable sources from the sun and wind	Article 8	The Council of Ministers	Ministry of Infrastructure and Energy	Adopted / <a href="#">No. 369</a> , 26.4.2017	
Decision on approving the methodology for determining the purchase price of electricity produced by small-scale renewable sources of biodegradable solid waste utilizing industrial, urban and rural waste	Article 8	The Council of Ministers	Ministry of Infrastructure and Energy	Adopted / No, 27, 17.1.2018	
Decision on approving the methodology for determining the annual purchase price of electricity to be paid to existing priority generators	Article 10	The Council of Ministers	Ministry of Infrastructure and Energy	Adopted / <a href="#">No. 687</a> , 22.11.2017, Amended <a href="#">Decision</a> , 13.05.2020	
Methodology for the calculation of the renewable energy obligation to be paid by the final consumers of electric energy	Article 11	The Council of Ministers	Albanian Electricity Regulatory	not adopted / Deadline: February 2018	
Decision on the approval of network code on requirements for connection of generators with the grid	Article 12	The Council of Ministers	Albanian Electricity Regulatory	Adopted/ <a href="#">No. 127</a> , 4.6.2018	
Order on the approval of the simplified procedure for connection to the distribution system of small renewable projects for solar electricity generators	Article 15	The Council of Ministers	Ministry of Infrastructure and Energy	Adopted / <a href="#">No. 3</a> , 20.6.2019	

Legal act	Primary legal basis	Bodies in charge		Adoption / validity status	Comments /Compliance status
		Adoption /Approval	Drafting		
Decision on approval of the regulation on the release, transfer and cancellation of the origin guarantees for electricity produced from renewable resources	Article 16	Albanian Electricity Regulatory	Albanian Electricity Regulatory	Adopted / <a href="#">No. 229</a> , 20.12.2019	
Legislation on production, transport and marketing of biofuels and other renewable fuels, for transport	Article 19			not adopted	draft Law on biofuels under preparation, adoption pending
Methodology for the acquisition price of the electric energy from the priority producers, that have a 'Plant acceptance certificate' for the electric plant within 31 December 2020	Article 22	The Council of Ministers	Albanian Electricity Regulatory	not adopted / Deadline: February 2018	
Conditions and procedures for the acquisition of electric energy produced by priority producers of electric energy, that do not benefit from the support scheme, according to the contract for difference	Article 22	The Council of Ministers	Albanian Electricity Regulatory		

The current institutional framework in Albania consists of the following key power sector institutions and companies:

- Government and regulatory actors which include the Albanian government and respective ministries, the regulator and agencies to whom ministries delegate specific sector responsibilities
- Public sector companies: The Albanian Power Corporation (KESH), Albanian Transmission System Operator (OST) and Albanian distribution system operator (OSHEE)
- Line of oversight from the relevant ministries to each public sector company

The Ministry of Infrastructure and Energy (MIE) and the Energy Regulatory Authority (ERE) are two key institutions in setting the policy and regulation of the Albanian power sector. Because of the unbundling requirements of the acquis the Ministry of Economic Development oversees the OST. Other ministries have smaller roles within the energy sector. There are also few governmental agencies with various responsibilities with respect to the power sector and usually are monitored and managed by the ministries. Albania has a well-defined set of institutions, listed in the Table 0-5, with clear responsibilities in governing, regulating, operating, and participating in the sector.

Table 0-5 List of energy sector institution of Albania

Institution	Description	Website
The Ministry of Infrastructure and Energy (MIE)	The MIE is responsible for the overall energy sector including the review and update of the National Energy Strategy, development of the energy policies, market reforms to meet the national objectives and to comply with the EU directives, promoting energy efficiency and renewable energy sources and investments in the energy sector. The MIE is also responsible for granting the authorisation and concession rights for the construction of power plants in Albania.	<a href="http://www.infrastruktura.gov.al/e">www.infrastruktura.gov.al/e</a>




Institution	Description	Website
4The National Agency of Natural Resources (AKBN)	The AKBN is under the supervision of the MIE and is designated for the development and supervision of the rational use of natural resources. The AKBN monitors the sustainable use and rehabilitation of natural resources in mines, hydrocarbons and energy. AKBN also provides the energy data to the National Institute of Statistics (INSTAT) since the AKBN compiles and publishes the annual energy balance sheets at the national and regional levels in compliance with Eurostat and IEA.	<a href="http://www.akbn.gov.al">www.akbn.gov.al</a>
The Ministry of Tourism and Environment (MTE)	The MTE is responsible for environmental protection, safeguarding of protected areas, forests and biodiversity and climate change. The MTE is responsible for approving the strategic environmental assessments for any territorial or sector-based plan. The MTE is also the focal point for the implementation of the United Nations Framework Convention on Climate Change.	<a href="http://www.turizimi.gov.al">www.turizimi.gov.al</a>
The National Environmental Agency (NEA)	The NEA works under the MTE and is responsible for reviewing the environmental impact assessment (EIA) process for projects under the Law No. 10 440 on “Environmental impact assessment”. According to this law, all projects related to the power sector require and EIA prior to being granted a construction permit. Small renewable power plants are only initially subjected to a preliminary EIA or if needed, upon the review, the NEA may decide to further ask for the in-depth EIA.	<a href="http://www.akm.gov.al">www.akm.gov.al</a>
The Ministry of Agriculture and Rural Development (MARD)	The Directorate for Administration of Water Resources at the MARD oversees the sustainable management of irrigation, drainage and flood protection, improvement of the efficiency of water resources, reduction of the risks of dam destructions and management of river and sea flooding. The MARD issues all water use permits for hydropower generation projects.	<a href="http://www.bujesia.gov.al">www.bujesia.gov.al</a>
The Energy Regulatory Authority (ERE)	The ERE is an autonomous, independent, and non-profit public institution which regulates energy activities in Albania. Its responsibilities include regulating activities in the electricity and natural gas sectors, developing and adopting electricity market rules while also monitoring all electricity market operations in Albania. The ERE issues licenses for electricity generation, transmission, distribution, supply and trade. The regulator adopts electricity tariffs, including feed-in tariffs (FITs), to all eligible electricity producers from renewable sources. ERE also defined the standard purchase agreements of these producers.	<a href="http://www.ere.gov.al">www.ere.gov.al</a>
The Transmission System Operator (OST)	The OST is a legal entity licensed to perform the activity of electricity transmission, which owns the transmission system and respects the principle of independence, defined in Article 54 of Law no. 43/2015 On Power Sector, as amended. The OST is public company with 100% of state shares. The OST performs the roles of the transmission network operator, market operator and dispatch system operator. The OST company guarantees the necessary transmitting capacities for uninterrupted electricity supply of electricity distribution system substations, as well as electricity customers connected directly in the transmission network, electricity transmission produced from the country resources, transitions and exchanges with the neighbouring countries through the European Network Transmission System Operators for Electricity (ENTSO-E). Electricity transmission in Albania is performed through the high voltage network 400 kV, 220 kV, 150 kV, and 110 kV. In accordance with the 2019 Electricity Sector Law OST has spun-off the electricity market operator, the Albania power Exchange (ALPEX) which was registered on 23 <sup>rd</sup> of October 2020. ALPEX is owned by the OST and the Kosovo transmission system operator (KOSST). It will operate the Day-Ahead and Intra-Day markets of both Albania and Kosovo.	<a href="http://www.ost.al">www.ost.al</a>
The Albanian Power Corporation (KESH)	The KESH is the public producer and, at the same time, the largest electricity producer in Albania. The KESH operates the most important electricity generating plants in the country. The KESH is also responsible for the administration, the proper operation as well as for guaranteeing the technical and operational safety of the power plants it operates. KESH is not only one of the most important producers of electricity from hydro sources in the region, but is considered to have a regional impact, in terms of the security of hydro plants. The corporation is undergoing a progressive transformation from a monopoly into one of the country’s largest power generation companies operating in a liberalised market.	<a href="http://www.kesh.al">www.kesh.al</a>





Institution	Description	Website
The Electricity Distribution System Operator (OSHEE)	The OSHEE is an energy company engaged in constructing, operating, maintaining, and developing the electricity distribution network serving households and private clients throughout Albania. The company is responsible for the maintenance and operation of the distribution system below 35 kV. The operator is obliged to connect all consumers and/or producers to the distribution system in a transparent and non-discriminatory way. The OSHEE was unbundled in March 2018, establishing three new companies: The Free Market Supplier, the Distribution System Operator, and the universal Service Supplier. Distributed power producers sell their power to the Free Market Supplier.	<a href="http://www.oshee.al">www.oshee.al</a>

The Renewable energy Law envisages the creation of the agency responsible for renewable energy that will develop and oversee the register of renewable energy producers and their energy balances, however this has not been established yet.

There are various funding initiatives actively participating in Albania and the Table 0-6 lists most of the ongoing projects funded by international funding organizations in Albania.

Table 0-6 List of funding initiatives in Albania

Project/Programme title	Short description of the Project/Programme	International funding organizations	Budget	Starting/ Starting and ending year
Green for Growth Fund Southeast Europe (GGF)	The Green for Growth Fund (GGF) is the first specialized fund to advance energy efficiency (EE) and renewable energy (RE) in Southeast Europe. GGF provides refinancing to Financial Institutions to enhance their participation in the EE and RE sectors and makes direct investments in Non-Financial Institutions with projects in these areas. The activities of GGF are supported by a Technical Assistance Facility for projects preparation.	European Investment Bank (EIB)  KfW Development Bank 	316 mil. EUR Western Balkans	2009 - 2025
Western Balkans Enterprise Development & Innovation Facility (WB EDIF)	Set up under the EU umbrella of Western Balkans Investment Facility, WB EDIF was launched in December 2012 by the European Commission, the European Investment Fund, the European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB), acting as co-lead international financial institutions. This WB EDIF aims at increasing the financial resources made available to SMEs (not restricted to RES related SMEs) based in the Western Balkans, to support socio-economic development and EU accession across the region. The activities include SME equity financing, SME loan guarantee, SME lending and support services.	European Union (EU) 	145 mil. EUR	2013 - 2027
Biomass Energy for productive use for Small and Medium Enterprises (SMEs) in the Albanian olive oil sector	The project aims to increase the use of biomass in industrial energy consumption for productive use through demonstrated use of modern biomass technologies in Small and Medium-sized	United Nations Industrial Development Organization (UNIDO)	5.4 mil. USD	2014 - 2018

Project/Programme title	Short description of the Project/Programme	International funding organizations	Budget	Starting/ Starting and ending year
	Enterprises (SMEs) in the olive oil industry.			
Western Balkans Investment Framework	The Western Balkans Investment Framework (WBIF) is a joint initiative of the EU, international financial institutions (CEB, EBRD, EIB, KfW, World Bank and Agence Francaise du Development), bilateral donors and the governments of the Western Balkans which supports socio-economic development and EU accession across the Western Balkans through the provision of finance and technical assistance for strategic investments, particularly in infrastructure, energy efficiency and also private sector development.	European Union (EU) 	600 mil. EUR	2016 - 2026
Green Economy Financing Facility (GEFF) for the Western Balkans	EBRD's Green Economy Financing Facility (GEFF) provides finance for green economy investments in residential sector, as well as to businesses who supply energy efficiency and renewable energy products and services to households, in namely in Albania, Bosnia and Herzegovina, North Macedonia, Kosovo, Montenegro and Serbia.	European Bank for Reconstruction and Development (EBRD) 	85 mil. EUR	2017 - 2020
Albania - IPA Support in the Energy Efficiency Sector and the Renewable Energy Sources Development	The project provides the support to the recently created Energy Efficiency agency, organised on three levels: organisational/structure, technical support and communication and awareness raising. Support to the sector of renewable energy sources is also planned to be defined and provided.	European Union (EU) 	0.5 mil. EUR	2019 - 2019

#### 1.1.5. Main financing mechanisms

In Albania, renewable energy sources are supported through the following support mechanisms [12]: Feed-in Tariff, Net-metering, Tax regulation mechanism and Tenders (Contract for Margin).

##### 1.1.5.1. Feed-in tariffs

Feed-in tariffs (FIT) were the only forms of renewable energy supported in the period from 2007 to 2017. FIT's are provided to eligible small-scale renewable energy power plants which include small hydro power plans up to 15 MW, solar PV plants up to 2 MW and wind energy plants up to 3 MW. The Free Market Supplier (unbundled subsidiary of the OSHEE presented in the Table 0-5) is obliged to purchase renewable energy generated by the eligible power plants at the tariff set by the independent regulator ERE and is guaranteed for 15 years. The tariff is defined by the regulator by assuming a reasonable return on investment. The regulator also grants the licence for power production after technical and economic evaluation of the proposed power plant, environmental impact assessment, water usage permission in case of hydro and permission from the OST if needed. Once licenced the renewable energy producer draws up a Power purchase agreement (PPA) with the off taker.



The Council of Ministers Decision (CMD) no. 687 from 2017, approved a methodology for the setting of prices for electricity for the existing priority producers. The CMD sets the limit for the electricity purchase prices which can be neither be less than 15% or more than 15% of the reference price set by ERE in 2016. The Figure 0-7 presents the prices set by ERE during the period 2016-2020 in Albanian lek. In 2018 the price was set to maximum price allowed by the law.

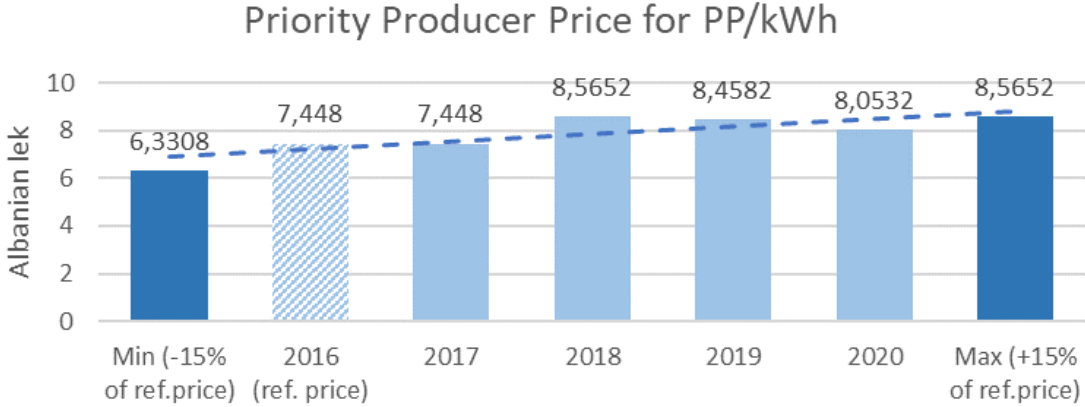


Figure 0-7 The price for priority producers set by ERE during 2016-2020 per kWh

In 2019, hydropower received 100% of the feed-in tariffs in Albania, around EUR 90 million [13]. The amount paid to Priority Producers in Albania is large and is increasing annually. In the last few years, the MIE reports that 12 out of 88 applications for the construction of solar PV power plants up to 2 MW have been authorised for construction and only 3 out of 70 applications have been authorised for the construction of wind power plants up to 3 MW.

1.1.5.1. Premium tariff and Contract for differences

Large renewable energy power plans whose installation capacities are above those set by the FiT as described in the Chapter 1.1.5.1 are eligible for the Premium tariff or Contract for difference (CfD). The tariff is determined through competitive bidding between the bidders. The Council of Ministers approve the terms and conditions of the auction based on their criteria that might limit certain technologies in the tender because of resource diversification or network connection costs. Same as FiT, the CfD is foreseen to have a duration of 15 years. As a support measure, the producers can sell the electricity in the market and receive the variable difference between the auction price and the electricity market price which is now based on the Hungarian power exchange price. In case of electricity market prices being higher than the auction price, the producers will be obliged to bear the difference. The first auction bidding round was launched in 2018 and the winning bidder was to construct a 100 MW solar PV plant where half of the plant’s generation would be eligible for a 15-year CfD tariff of 59.9 EUR/MWh and the other half would be sold at the market price. As already stated in the chapter 1.1.2, this contract has never been signed. The second auction bidding round was launched in 2020 for a 140 MW solar PV plant in Karavasta (Lushnjë-Fier), whereby half of the installed capacity would be eligible for a CfD tariff of 24.89 EUR/MWh and the rest would be sold at the market price. The contract was signed in May 2020 and the construction will start in 2021. The latest auction bidding round was launched at the end of 2020 for the construction of a 100 MW solar PV plant called Spitalia in the region of Durrës, of which 70 MW will be eligible for CfD with a price ceiling of 55 EUR/MWh.

#### *1.1.5.2. Net-metering scheme*

The net metering scheme is operational and is developed for the small produces for photovoltaic power plants of up to 2 MW. The metering is done monthly, and surplus electricity can be sold to the service provider and remunerated according to a price that should be set by the ERE. The methodology for the calculation of the renewable energy surcharge to be paid by the final consumers of electricity is still not adopted by the ERE. The renewable energy surcharge is still included in a non-transparent way in the distribution tariff and paid only by the final electricity consumers connected to the distribution grid and not to the ones connected to the transmission network (such exemption could amount to the State aid).

Further improvement of issuing the connection permits for photovoltaics is needed and the Ministry of Infrastructure and Energy (MIE) is working on this issue jointly with the Albanian Distribution System Operator (OSHEE). Both institutions are still negotiating about the methodology for calculating the electricity price from self-producers and all the respective documents should be ready in 2021.

The Albanian government expects this programme to enable the deployment of 200 MW of PV plants over an unspecified period [14].

#### *1.1.5.1. Customs and excise tax exemptions*

The equipment and machinery used for the construction of energy power plants (both non-renewable and renewable technologies) are exempted from custom duties. In addition, excise tax exemptions for the fuel used by electricity producers are in place. Tax exemption does not apply for metering equipment such as wind masts or solar thermal systems. After obtaining the relevant building permit, the investors in renewable energy sources power production must submit to the MIE, 6 months prior to importation, a complete list of specified machinery and equipment, which will be imported for the planned power plant. The MIE verifies and adopts the list. The Directorate General of Customs based on the list approved by the MIE implements the exemption from import duties.

In 2018 the decision of Albania's Council of Ministers changed numerous implementing provisions of the VAT legislation, a VAT exemption is also introduced for imported qualifying machinery and equipment directly used on contracts with a value of at least EUR 400 thousand to produce renewable solar energy with an installed production capacity of more than 0.5 MW.

#### *1.1.6. Communication*

The wider adoption of renewable energy in Albania, especially at the household level, requires government-backed and well-structured awareness campaigns so that the citizens become more actively involved and participate in the energy transition. It is also important to communicate with public so that they understand the direct benefits of renewable energy technologies, both for the country as a whole and for individual citizens. High upfront investment costs of renewable energy technology, as well as lack of understanding of the payback periods of such investments discourage citizens to participate and to help uptake the renewable energy sector in Albania. Furthermore, the public is not always aware of existing support mechanisms and various incentives that are supposed to help them use renewable energy technologies. Such supporting schemes should always be clearly communicated, and this is also a great opportunity to present country's commitment to and support for more environmentally friendly energy use.

The MIE should lead the awareness-raising campaigns especially with regards to governmental plans for the development of the renewable energy sector that can provide more confidence to investors and thereby attract investments in the energy sector. The campaigns should be designed in a way that

they improve the public knowledge of the economics and benefits of renewable energy technologies and the need for their wider deployment.

UNDP Albania Program on Solar Water Heating (SWH) [15] is a good example of the project for which the initial idea came from the National Energy Strategy and previous climate change studies such as Albania's First National Communication and Technology Needs Assessment. All these documents emphasized the solar water heating technology should be promoted since such technology will significantly reduce electricity and fuel wood consumption and thereby reduce the greenhouse gas emissions. The project promoted the legal and market based approach to increase the use of energy efficient and innovative solar water heating technology. Numerous trainings were delivered to representative of the SWH supply chain including architects, engineers, students, municipal staff, etc. The cooperation with the Tirana Polytechnic University was enhanced to provide a Design Manual of the SWH systems for the needs of the Scientific Masters' Programs on Renewable Energy and associated with training courses to students of Energy, Environment, Architecture, and Building engineers.

## 1.2. Georgia

### 1.2.1. Status

Since 1994, Georgia has been a Non-Annex I Party to the United Nations Framework Convention on Climate Change (UNFCCC). In 1999 Georgia accessed the Kyoto Protocol. Georgia has made solid progress in the past decade both in the transition to a more sustainable energy system as well as in improving the security of its energy supply. All the EU member states ratified the EU-Georgia Association Agreement in 2016 when it entered into force and a year later, in 2017, Georgia became the Contracting party of the Energy Community Treaty. According to the Protocol on the Accession of Georgia to the Energy Community Treaty, Georgia has committed to implement several EU directives and regulations on electricity and gas markets, security of supply, renewable energy, energy efficiency and statistics. From June 2017, Georgia officially enacted the Paris Agreement within the UNFCCC, which marks rebirth of global politics aiming at significant decrease of climate change risks and negative influence of economy, as well as limiting global increase of temperature at 2°C. Since then, Georgia made a great progress developing the legislative framework to encourage investments in renewable energy system. The government demonstrated the commitment to align its energy sector with the EU regulations for electricity and gas markets, renewable energy, energy efficiency, security of supply and energy statistics. In 2020 Georgia accessed the Doha's Amendment to Kyoto Protocol.

Georgia is committed to implement the 2030 Agenda for Sustainable Development Goals (SDG). The country has undertaken active measures to adjust the SDG targets and indicators according to its local conditions, challenges, and opportunities. Georgia declared all the 17 SDGs as national priorities in 2017 and in 2019 the process of nationalization of the SDGs was finalized. The Administration of the Government of Georgia (GoG) has been designated as a primary government institution responsible for overseeing coordination and implementation of the national sustainable development agenda.

According to the 2019 electricity production balance of Georgia from the total energy generation 73.8% came from HPPs, 25.8% from thermal power plants and 0.8% from wind. The Georgian power system is characterized by a seasonal asymmetry between energy consumption and energy production, which means higher production and lower consumption during spring and/or summer months (Figure 0-8 shows that this happened in May and June of 2019) and low generation rates with higher consumption during the autumn and winter months. At the annual level Georgia is a net importer of electricity even though there are few months (usually during summer) when the country exports electricity. One-third of the total electricity generation in the country is generated by the largest hydro power plant "Enguri" with the installed capacity of 1300 MW. In 2019 the USD 224 million project "Enguri Hydro power Plant Rehabilitation project" continued with the aim of making improvements to the Enguri HPP to alleviate the critical power shortage in Georgia at a low cost and to enhance the environmental benefits of the Enguri Hydro Power Plant facility.

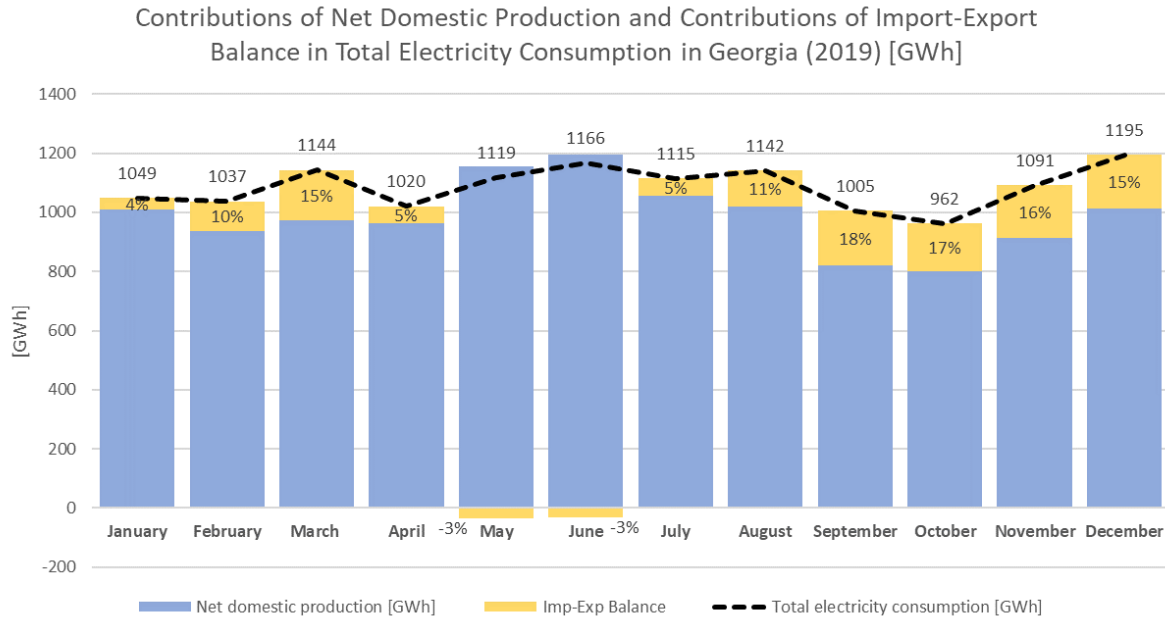


Figure 0-8 Net domestic production, contributions of import-export balance and total electricity consumption in Georgia for 2019

Georgia’s first energy balance was officially developed according to international standards in 2014 and that year is also used as the baseline for the calculation of the NREAP targets. According to the 2014 energy balance of Georgia, renewable energy accounted for 87% of the Georgian energy production out of which 52% of total primary energy supply was hydro, 34% biofuels (mainly firewood) and waste and 1% of geothermal and solar. Biomass, mostly firewood, which has a major share in primary energy consumption and is increasingly causing forest degradation. In the energy balance of 2019, the hydro continues to make the largest share of Georgian primary production and is followed by biofuel with 22%, 3% of geothermal and solar and non-renewable (coal, crude oil and natural gas) only 5%.

Natural gas and almost 90% of the coal consumed domestically was imported as well as most of the oil products, except for minor quantities produced by two small refineries that recently commenced operations. Natural gas and oil products together formed 68% of the total primary energy supply (TPES) in 2018. Transport was the largest energy-consuming sector in 2019, responsible for 34% of final energy consumption, followed by the residential (31%) and industry (18%) sectors. Oil and natural gas are the main energy sources in final consumption. Natural gas is partially used for electricity generation, in industry and in the residential sector where it accounts for the largest share of energy consumed, while oil products are mostly used in the transport sector.

Main renewable energy source in Georgia is hydroelectricity, accounting for nearly two-thirds of the renewable energy share in total primary energy supply (TPES). The rest was made up mainly by solid biomass (fuelwood) from domestic forestry (23%), along with small amounts of geothermal, wind and solar energy. New hydro capacities were added in the recent years, a 20.7 MW wind farm has been commissioned and around 3 MW of small-scale distributed solar PV capacities have been installed thanks to the net metering programme (Figure 0-9). More than 100 hydropower projects are under development and over 40 are in the construction phase [16].

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### BOX 3 - Paravani hydropower plant

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Cooperation and discussions with regional neighbours regarding best practices in delivering energy-efficient products or in providing renewable energy infrastructure is significantly important for Georgia. An example of best practices for **transboundary cooperation** in terms of comprehensive energy infrastructure is Paravani HPP, which has been completed in August 2014 as a result of the Georgia-Turkey co-investment. The EBRD has been providing part of the financing for the construction and operation of the Paravani HPP, a 90 MW run-of-river facility, and associated electricity transmission facilities, located in the Samtskhe-Javakheti region of Georgia. The power plant is connected to a converter substation located in Akhaltsikhe, Georgia allowing for connection to the Georgian grid and seasonal electricity export to Turkey. The substation is part of the Black Sea Energy Transmission System project, which is also being financed by the Bank.

It should be noteworthy, that the project would be the first greenfield hydropower plant of its size in Georgia since the early 1980s and is pioneering the effective financing of several other renewable projects for which concessions were awarded to various international and national developers. Finally, the Bank's participation will ensure that the project is implemented in accordance with best environmental practices.

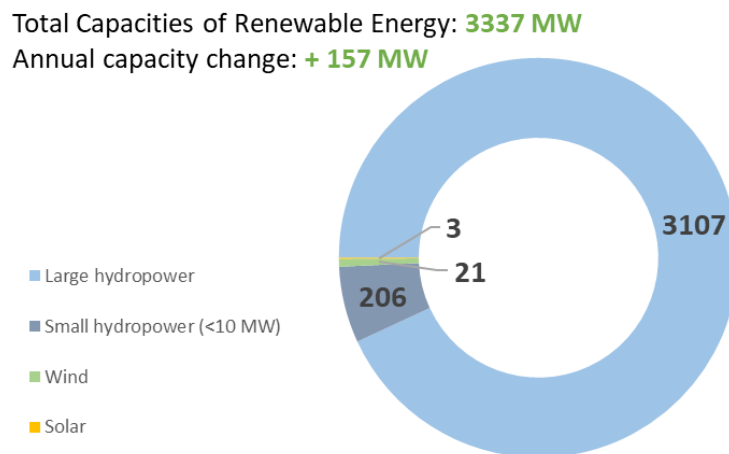


Figure 0-9 Total Capacities of Renewable Energy 2019 in Georgia (source: Energy Community Secretariat)

Based on the National Renewable Energy Action Plan [17] from 2019 Georgia has an immense untapped potential of wind, solar, geothermal and especially hydro resources:

- It is estimated that a total potential capacity of hydro power is 15 GW with a total production potential of 50 TWh per year of which approximately 22% is at the moment utilised in terms of capacity and 17% in terms of energy production
- The average annual electricity generation potential of wind in Georgia is estimated to be 4 TWh with an installed capacity of 1.5 GW

- The Georgian geothermal water reserves reach 250 million m<sup>3</sup> per year and there are more than 250 natural and artificial water boreholes where the average temperature of geothermal waters ranges between 30 and 110°C
- Solar radiation is relatively high and in most regions of the country there are 250-280 sunny days with approximately 1800-3000 hours of sunlight per year. The annual solar radiation varies between 1250-1800 kWh/m<sup>2</sup>

The effective utilization of renewable energy sources could result in the production of additional 20 TWh in the future. The full utilization of Georgia's renewable energy sources could significantly contribute to climate change mitigation of the country.

The electricity demand is steadily increasing by 5-7% annually, while the construction of new generation capacities is delayed which poses significant challenges. The Georgian Government is therefore working on the improvement of self-sufficiency via the utilization of local renewable energy resources by constructing new hydro-, wind- and solar-powerplants as well as non-renewable capacities such as combined cycle natural gas-fired turbine plants (CCGT), aiming towards the reduction of imports dependency. The utilization of countries' renewable energy sources became one of the major areas of Georgia's energy sector development.

### 1.2.2. Targets

Because of its late accession to the Energy Community, Georgia adopted the National renewable energy action plan (NREAP) only at the end of 2019. The document contains a set of measures to promote renewable energy. However, there is no obligatory 2020 targets.

In April 2021, the Government of Georgia (GoG) adopted the revised version of the Nationally Determined Contribution (NDC) which are defined by the member states under the Paris Agreement of the UNFCCC. The GoG adopted three documents developed by the Ministry of Environmental Protection and Agriculture of Georgia: NDCs determined by the Paris Agreement [18], Climate Change Strategy of Georgia for 2030 and 2021-2023 action plan of the respective strategy. The documents were submitted to the UNFCCC in May 2021.

In frames of NDCs and the newly determined strategy at the national level, Georgia will ensure that by 2030, the country will decrease total data of greenhouse gas emissions at 35%, as a comparison to 1990 [19]. This is an approximately 16% per capita GHG reduction by 2030. The Climate Change Strategy for 2030 in Georgia has determined remedies for decreasing greenhouse emissions. The key components of Georgia's new climate pledge include the following targets:

- Georgia is fully committed to an unconditional limiting target of 35% below 1990 level of its domestic total greenhouse gas emissions by 2030
- Georgia is committed to a target of 50-57% of its total greenhouse gas emissions by 2030 compared to 1990, in case of international support. If the world will follow 2°C average global temperature increase holding scenario, reduction of emissions by 50% will be necessary while in case of limiting increase to 1.5°C, it will be necessary to reduce emissions by 57% compared to 1990 level (Figure 0-10)
- The updated NDC of Georgia sets 2030 Climate Change Strategy and Action Plan for the determination of mitigation measures contributing achievement of unconditional and conditional commitments and mitigation targets
- Georgia is committed to continue studying its adaptive capacity of different economic sectors to the negative effects of climate change, as well as to plan and implement the respective

adaptation measures by mobilising domestic and international resources for the sectors particularly vulnerable to climate change

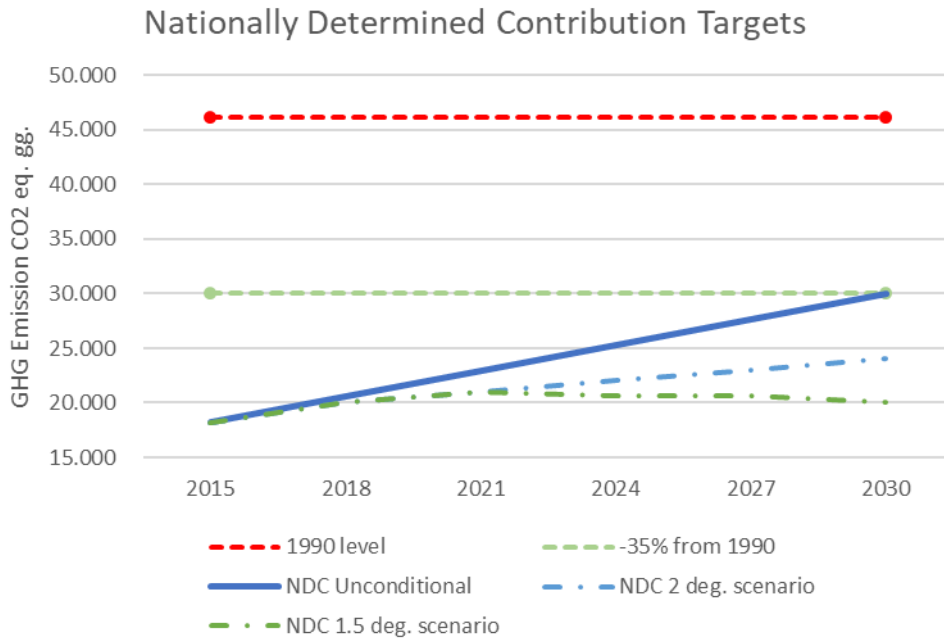


Figure 0-10 Nationally Determined Contribution Targets ((source: UNFCCC [18])

Georgia has determined the next decade, between 1<sup>st</sup> January 2021 and 31<sup>st</sup> December 2030, to be the timeframe for the implementation of the country’s Nationally Determined Contribution. In the following decade Georgia plans to mitigate the GHG emissions from energy generation and transmission sector by 15% from the reference level and the same percentage is planned for the transport sector. The updated NDC also supports the development of low carbon approaches in the building sector, including public and touristic buildings through encouraging the climate-goals oriented energy efficient technologies and services.

Georgia has set up a core team for the development of the National energy and climate plan (NECP) and the draft chapters of the NECP have been submitted to the Energy Community Secretariat in August 2020. Work on the analytical part of the plan, especially on the policy scenarios, is still ongoing. According to the Georgian Law on Energy and Water Supply, the NECP will be an “Annex of the Energy Policy”.

### 1.2.3. Jobs created

According to the statistics, the data from January 2019 show that there are 122 active enterprises working on electricity, gas, steam, and air conditioning supply. Among them, only 7 enterprises managers or directors’ positions are taken by women.

The section 6 “Gender and Climate Change in Georgia” of the updated Nationally Determined Contribution of Georgia [18] is clearly emphasizing the achievement of the gender equality and empowerment of all women and girls targets of the Sustainable Development Goal 5. Georgia intends empowering women by involving them in decision-making processes addressing healthcare issues induced by climate change and related to the activities and programs, such as awareness raising on climate change, capacity-building and knowledge-sharing aiming at changing behaviour. Georgia further considers empowering women through their participation in decision-making processes related to energy efficiency and renewable energy sources measures and efficient use of water



resources in households. The NDC document also invites all stakeholders and relevant domestic organizations to provide adaptation resources channelled towards women wherever their vulnerability level is high.

#### 1.2.4. Policy instruments and programmes


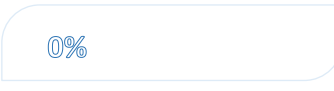
The key priority of the Georgian energy policy is to cover the demand for electricity with the maximum possible utilization of local renewable resources and substituting imports with non-renewable capacities such as combined cycle natural gas-fired turbine plants.

The new Energy Policy came into force in Georgia in June 2015 with the aim to develop a long-term comprehensive state vision of the energy sector and which later become the basis for the development of short-, medium- and long-term strategy for 2030 emphasizing renewable energy technologies implementation into Georgian energy system.

In April 2017, The Energy Community Treaty (ECT) was ratified by the Georgian Parliament. The Georgian accession is also the commitment for approximating Georgia’s energy sector with the European Union energy market rules meaning Georgia is obliged to transpose and implement the EU Directive 2009/28/EC “On the promotion of the use of energy from renewable sources”. The Annual implementation report from the November 2020 [20] presents the status of alignment of the Georgia Energy Sector with the EU directives and the renewable energy implementation is presented in the table below (Table 0-7).

Table 0-7 Renewable Energy Implementation in Georgia (source: Energy Community Secretariat [20])

Renewable Energy Indicators	Transposition Assessment*	Implementation status*	Description
National Renewable Energy Action Plan	~	25%	Due to its late accession to the Energy Community, Georgia adopted the NREAP only at the end of 2019. The document contains a set of measures to promote renewable energy. However, there is no obligatory 2020 targets.
Quality of support schemes	~	38%	For years, hydropower was promoted through guaranteed power purchase agreements (PPAs). In July 2020, the Government of Georgia adopted a secondary act introducing a feed-in premium (FiP) for hydropower plants with installed capacity higher than 5 MW. A support scheme for other renewables technologies is not yet in place.
Grid integration	~	56%	The newly adopted Law on Promoting the Production and Use of Energy from Renewable Sources envisages guaranteed and priority access to renewable energy producers, which is still to be implemented through regulations. Current hydro producers supported with feed-in tariffs under a PPA are exempted from balancing responsibility, which is not in line with the State Aid Guidelines.
Administrative procedures and guarantees of origin	~	49%	Licensing and permitting procedures need to be simplified and streamlined. There is no single administrative body established. An electronic system for issuing, transfer and cancellation of guarantees of origin is not yet in place.

Renewable Energy Indicators	Transposition Assessment*	Implementation status*	Description
Renewable energy in transport			Provisions related to the sustainability of biofuels are still not transposed and the legal framework remains completely non-compliant with Directive 2009/28/EC.

\* Methodology was developed by the Energy Community Secretariat

In 2019, Georgia adopted the Law on Promoting the production and consumption of energy from renewable sources [21] and the first National renewable energy action plan 2019-2020 (NREAP) [17]. Decarbonization of the energy sector is the key pillar of the Energy Strategy of Georgia 2020-2030 which was adopted in 2019 by the Ministry of Economy and Sustainable Development (MoESD). As reported by the International Energy Agency in the Energy Policy Review – Georgia 2020 [16], the strategy can however, be improved in a way that the government should complement the existing document with a long-term action plan that encompasses a wider vision and strategic milestones based on modelling.

From 2021 NREAP's objectives will be part of decarbonization chapter of the National energy and climate plan (NECP). The NECP will provide an overview of the current energy system and the energy and climate policy. It will also provide an overview of the national targets to be achieved by 2030, which include the reduction in greenhouse gas emissions, an increase of energy produced from renewable energy sources, energy efficiency promotion and strengthening of the power system interconnectivity. The document will be consistent and will contribute to the Sustainable Development Goals. The NECP will address the main dimensions as laid out by the EU and Energy Community. These dimensions are specified within the Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union.

The secondary legislation as an important aspect of the key renewable energy laws, the Law on Energy and Water Supply and the Law on Promoting the Production and Use of Energy from Renewable Sources, is listed in the Table 0-8.

Table 0-8 Renewable energy secondary legislation status for Georgia (last update 01.12.2020, source: Energy Community Secretariat [22])

Legal act	Primary legal basis	Bodies in charge		Adoption / validity status	Comments /Compliance status
		Adoption /Approval	Drafting		
Methodology for calculating energy received from RES	Article 5	Government of Georgia	Ministry of Economy and Sustainable Development	Adopted / <a href="#">N376</a> , 22.06.2020	
Rule on announcing competitive bidding, for encouraging collecting energy from renewable sources, except for the electricity produced by small power plants	Article 21	Government of Georgia	Ministry of Economy and Sustainable Development	Not adopted / deadline: June 2021	
Rule on granting and cancelling status of privileged generator of RES	Article 21	Government of Georgia	Ministry of Economy and Sustainable Development	Not adopted / deadline: June 2021	
National Renewable Energy Action Plan	Article 4	Government of Georgia	Ministry of Economy and	Not adopted / deadline: December 2020	An initial draft has been prepared

Legal act	Primary legal basis	Bodies in charge		Adoption / validity status	Comments /Compliance status
		Adoption /Approval	Drafting		
			Sustainable Development		
Support schemes for the production and use of renewable energy sources	Article 11	Government of Georgia	Ministry of Economy and Sustainable Development	Adopted / <a href="#">N403</a> , 02.07.2020	The support scheme for HPPs was adopted on 02.07.2020 by the Ordinance of the Government of Georgia
Rule on certification and compliance of biofuels, biogas and bio liquids	Article 17	Government of Georgia	Ministry of Economy and Sustainable Development	Not adopted / deadline: December 2021	
Rule on licensing and price setting on biofuels, biogas and bio liquids production	Article 17	Government of Georgia	Ministry of Economy and Sustainable Development	Not adopted / deadline: December 2021	
Criteria for Sustainability of Biofuels and Bio Liquids Production	Article 18	Government of Georgia	Ministry of Economy and Sustainable Development	Not adopted / deadline: December 2021	
Rule on calculation of the greenhouse gas impact of biofuel, bio liquids and their fossil fuel comparator	Article 18	Government of Georgia	Ministry of Economy and Sustainable Development	Not adopted / deadline: December 2021	
Rule for Accounting the Energy Received from Thermal Pumps	Article 5	Government of Georgia	Authorized body	Adopted / No 74, 06.02.2020	
Rule on developing minimum requirements for the template for national renewable energy action plans	Article 4	Government of Georgia	Authorized body	Adopted / No 75, 06.02.2020	
Legal act regulating ecologic labelling, as well as ecologic criteria for labelling electric, gas and gas absorption heat pumps	Articles 13	Government of Georgia	Authorized body	Not adopted / deadline: December 2020	The first draft prepared with the support of ECS.
List of Qualified and Certified Installers	Article 14	Government of Georgia	Authorized body	Not adopted / deadline: December 2020	
Rule for Issuance of Certificates of Origin for Electricity from Renewable Sources	Article 15	Georgian National Energy and Water Supply Regulatory Commission	Georgian National Energy and Water Supply Regulatory Commission	Not adopted / deadline: December 2021	
Rule for Normalization of Accounting Electricity generated from Hydro Energy and Wind Energy	Article 5	Ministry of Economy and Sustainable Development of Georgia	Ministry of Economy and Sustainable Development of Georgia	Adopted/ No 1-1/119, 05.03.2020	
Rules for Issuance of Certificates for Heating and Cooling from Renewable Sources	Article 15	Georgian National Energy and Water Supply	Georgian National Energy and Water Supply	Not adopted / deadline: December 2021	

Legal act	Primary legal basis	Bodies in charge		Adoption / validity status	Comments /Compliance status
		Adoption /Approval	Drafting		
		Regulatory Commission	Regulatory Commission		

The current institutional framework in Georgia consists of the following key energy sector institutions and companies listed in the Table 0-9. Ministry of Economy and Sustainable Development (MoESD) and the Ministry of Environmental Protection and Agriculture (MEPA) are two key institutions in setting the policy and regulation of the Georgian energy sector, the MoESD for the renewable energy policy and MEPA for biomass production. There are also few governmental agencies with various responsibilities with respect to the energy sector and usually are monitored and managed by the ministries. In the renewable energy sector, the most important institution is The Georgian Energy Development Fund (GEDF) which is a state-owned joint-stock company subordinate to the MoESD. It was created in 2010 to seek out prospective renewable energy projects and promote their development.

Table 0-9 List of energy sector institution of Georgia

Institution	Description	Website
Ministry of Economy and Sustainable Development (MoESD)	Key state body responsible for the implementation of national energy efficiency policy in Georgia. MoESD, as the key body for policy planning in the field of energy, is responsible for cooperating with the relevant bodies in defining the energy sector as one of the priority areas. There are two departments responsible for the energy related issues at the MoESD: Energy Policy and Investment Projects Department and Energy Reforms and International Relations Department. The Ministry is responsible for developing a sustainable, reliable, cost-effective, and efficient energy system, to ensure the increase of network reliability, integration of renewable energy, meet increased demand, and enhance the reliability and capacity of inter-system transmission infrastructure.	<a href="http://www.economy.ge">www.economy.ge</a>
Ministry of Environmental Protection and Agriculture (MEPA)	The MEPA of Georgia is mandated to coordinate the implementation of national climate change policy and Georgia's strategy for international climate change negotiations under the United Nations Framework Convention on Climate Change. The responsibility of MEPA is to carry out state environmental policy, state management of usage of natural resources, environmental pollution monitoring and carry out ecological analysis, evaluation of river basins and reservoirs for existing and expected hydro-meteorological and environmental conditions.	<a href="http://www.mepa.gov.ge">www.mepa.gov.ge</a>
Ministry of Finance (MoF)	The ministry sets fiscal policy and oversees government spending. In the renewable energy sector, it raised concerns about the possible financial implications of memorandums of understanding (MoUs) and power purchase agreements (PPAs) signed with hydropower developers.	<a href="http://www.mof.ge">www.mof.ge</a>
Georgian National Energy and Water Supply Regulatory Commission (GNERC)	The national regulatory commission responsible for energy – natural gas and electricity markets – as well as the water sector. GNERC is responsible for studying and analyzing energy losses in the electricity network. Based on their research and recommendations, GNERC approves normative electricity losses in electricity networks for transmission and distribution licensees and provides Network sustainability	<a href="http://www.gnerc.or.ge">www.gnerc.or.ge</a>
Georgian Energy Development Fund (GEDF)	Managed by the Ministry of Economy and Sustainable Development (MoESD) is to promote the realization of the country's energy potential, retrieval of appropriate funds, by developing projects and their effective implementation. It supports the development of renewable energy capacity by: <ul style="list-style-type: none"> <li>• carrying out preliminary research works</li> <li>• conducting preliminary feasibility assessment of projects</li> <li>• conducting preliminary environmental impact assessments, and</li> <li>• finding investors and attracting their interest in existing projects.</li> </ul>	<a href="http://www.gedf.com.ge">www.gedf.com.ge</a>

Institution	Description	Website
Georgian State Electrosystem (GSE)	Responsible for providing transmission and exclusive dispatch services to about 60 eligible companies in Georgia. Cross-border electricity trade opportunities, high electricity demand growth, and the need for evacuation of the energy generated by the planned power plants will mean a need for investments in the transmission infrastructure for ensuring adequate development of the network.	<a href="http://www.gse.co.m.ge">www.gse.co.m.ge</a>
Electricity System Commercial Operator (ESCO)	Electricity System Commercial Operator (ESCO) is the Market Operator in the electricity sector of Georgia. ESCO has commenced its operation in 2006, based on the amendments introduced to the Law of Georgia on Electricity and Natural Gas. Following this Law and the Electricity (Capacity) Market Rules, ESCO exclusively pursues the Balancing Electricity and Guaranteed Capacity trading and fulfils the seasonal need for import/export of electricity and inspects the wholesale metering nodes. ESCO is a guaranteed purchaser of electricity produced by newly built power plants. The registration procedure conducted by ESCO for Eligible Enterprises to access the wholesale trade is easy and efficient. ESCO cooperates with the organizations that unite the electricity trade participant entities worldwide. Since 2014, the Electricity Market Operator is a member of APEX (Association of Power Exchange), which unites the energy companies of over 40 leading countries.	<a href="http://www.esco.ge">www.esco.ge</a>
Georgia Oil and Gas Company (GOGC)	The main incumbent company in the natural gas market and owner of the main gas pipeline system of Georgia. contributes to the unimpeded operation of transboundary oil and gas transportation systems on the territory of Georgia which significantly increases the security of the country's, EU and international energy markets through their diversification, manages the transit revenues. Owing to the strategic location of the country, GOGC supports the development of new transit routes for full use of the energy potential of the Caspian and the Black Sea basins and further integration of Georgia into regional/global economic and political structures	<a href="http://www.gogc.ge">www.gogc.ge</a>
Georgian Energy Exchange (GENEX)	Georgian Energy Exchange JSC was established jointly by the JSC Georgian State Electrosystem and JSC Electricity System Commercial Operator on December 4, 2019. The main functions of GENEX are: <ul style="list-style-type: none"> <li>• Day-ahead market operation.</li> <li>• Intraday market operation.</li> <li>• Bilateral contracts market operation.</li> <li>• Managing the financial clearing system for Day-ahead and Intraday markets.</li> </ul> The GENEX is responsible for ensuring the proper functioning of the platform of day-ahead and intraday markets and ensuring the settlement with market players. The platform, purchased from the company Nord Pool Consulting, will fully start operating in July 2021 for day-ahead markets and Summer 2022 for Intraday markets.	<a href="http://www.genex.ge/en">www.genex.ge/en</a>
JSC Telasi	JSC Telasi is one of the two major Distribution System Operators in Georgia and is responsible for the maintenance and operation of the electrical grid in the capital of Georgia, Tbilisi. The company serves more than 600 thousand clients, 52% of which are households, 38% - Commercial sectors, 10% - Public Sector and other Customers.	<a href="http://www.telasi.ge/en">www.telasi.ge/en</a>
JSC ENERGO-PRO Georgia	JSC ENERGO-PRO Georgia is one of the two major Distribution System Operators in Georgia and is responsible for the distribution of electricity in all of Georgia except of Tbilisi, the company serves more than 1 200 000 consumers and is spread over an area of 58846 km <sup>2</sup> , The Company was unbundled in 2016, JSC ENERGO-PRO Georgia Generation was established, which, at the present, manages and maintains 15 medium and small HPPs. ENERGO-PRO Group also maintains and operates the Gardabani gas turbine power plant LLC "G-Power".	<a href="http://www.energo-pro.ge/en/">www.energo-pro.ge/en/</a>
National Environmental Agency (NEA)	The National Environmental Agency was established in 2008 and operates under the Ministry of Environmental Protection and Agriculture. The Agency is responsible for carrying out hydrometeorological research for the black sea river basins and forecasting, to ensure the sustainability of hydro systems.	<a href="http://www.nea.gov.ge/En/">www.nea.gov.ge/En/</a>

#### 1.2.5. Main financing mechanisms

There are two ways of developing hydro energy power plants (HPP), first way is through the tendering of preselected sites by the former Ministry of Energy and the second through unsolicited applications

to develop sites not included on the official government list. Because of already described seasonality issues within the electricity sector the key condition of the Memorandum of Understanding (MoU) was to sell a certain share of annual generation to Electricity System Commercial Operator (ESCO) during the winter period in the first ten years after commissioning of the plant (first it was three winter months and now it is eight months). After signing of the MoU, the power purchase agreement (PPA) is signed between ESCO and the developer. In 2017 ESCO suspended signing new government backed PPAs because of possible negative effects of PPAs on the market and after the assessment of the fiscal impact the maximum offtake price was set to USD 0.06 per kWh for the period of up to eight months per year for ten years. Small hydropower plants with the capacity below 15 MW do not need a generation licence and have a special offtake regime from 2019. Such small HPPs can sell power to any consumer, including retail customers. If they do not find the customers, ESCO must buy their electricity during the eight months (from September through April) at the highest market tariff. As of September 2019, according to ESCO, over 90 MoUs and 48 PPAs had been signed.

In 2015, the Georgian National Energy and Water Supply Regulatory Commission (GNERC) passed a regulation introducing net metering for small-scale power plants with installed capacities of less than 100 kW. The net metering programme stimulated small business and household investments in distributed rooftop photovoltaic (PV) systems. In 2019 the Ministry of Infrastructure initiated a GEL 2 million programme and financed autonomous micro-PV plants in mountainous rural areas. For the utility-scale PV plants, the Georgian Energy Development Fund (GEDF) is planning to conduct a pilot tender for a 30 MW PV plant near Tbilisi with the support from the EBRD. Within the Energy Strategy 2020-2030 there are plans to conduct two solar power projects feasibility studies, one of 5 MW on the Gareji plateau and the other of 50 MW at Gardabani. The annual solar radiation varies between 1250-1800 kWh/m<sup>2</sup>a represents a promising environment for the use of solar collectors to supply hot water in most Georgian regions, however only a small amount of the country's solar thermal potential is being exploited.

The IEA Energy policy Review report [16] stresses out several promising sites for wind farms in areas close to Poti, Kutaisi, Rustavi, Tbilisi, the Rikoti Pass (Mount Sabueti) and the Chorokhi River. Based on the NREAP [17], Georgia has an immense untapped potential of wind with the average annual electricity generation potential of 4 TWh with an installed capacity of 1.5 GW. In 2016 the only wind power plant of 20.7 MW was commissioned at Kartli.

The IEA Energy policy Review report [16] also reports that as of September 2019, the Government of Georgia had signed MoUs with various investors for the construction of 18 wind power plants worth USD 1,560 million with the total capacity of 1,200 MW and expected generation around 4.6 billion kWh.

The second largest domestic source of energy in Georgia is biomass which is the main fuel used for heating in rural areas where around 90% of the rural population uses wood for heating. Even though the sector is being regulated by the Ministry of Environmental Protection and Agriculture (MEPA) and the Forestry Agency, the deforestation is still a vast problem, the use of wood for heating in inefficient stoves results in poor energy efficiency and poses a health hazard and makes Georgia a country with one of the worst indoor air quality. There are only few examples of buildings using wood briquettes made from agriculture residues. The government's policy has been to extend natural gas access to rural areas to replace fuel wood consumption even though the focus should be oriented to energy efficient equipment (water heaters, wood stoves, etc.) and usage of renewable energy sources in wood-consuming areas.

The Resolution №403 of the Government of Georgia, adopted on 2<sup>nd</sup> of July 2020, established support schemes for promoting the generation and use of energy from HPPs. The Resolution was amended on 29<sup>th</sup> of January 2021, to include all power plants using renewable energy sources, with installed capacity greater than 5 MW. The Resolution will fully be implemented after the energy market liberalization in mid-2021. Support schemes involve the following terms:

- The support period is established after the power plant has entered exploitation and after the production licensing stage has concluded, for 10 years, 8 months per year (from September to April)
- The plants benefiting from the scheme are entitled to Feed-in-Premium (FiP) up to 1.5 USc/KWh. Unless, as defined by Article 5, Point 3 of the Resolution, if the market price of electricity is lower than 5.5 USc/KWh, FiP is defined as the difference between the market price and 5.5 USc/KWh (but no greater than 1.5 USc/KWh).
- Feed-in-Premium is only applied on top of the standard electricity tariff if the market price of 1 KWh of electricity during the given hour is less than 5.5 USc.
- Feed-in-Premium is applied in national currency (GEL), using the exchange rate defined by the National Bank of Georgia on the date invoice was signed. As defined in the agreement.

Georgia benefits from significant levels of the technical assistance and financial support for renewable energy from various international organizations mostly listed in the Table 0-10. For instance, European Bank for Reconstruction and Development (EBRD) financed five renewable energy (hydropower)

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#### *BOX 4 - Georgia's first wind power plant*

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The Qartli wind power plant is commissioned in 2016 as the first WPP built in Georgia and the first WPP built in the South Caucasus. The 21.7 MW plant was built with the support of the European Bank for Reconstruction and Development (EBRD) that covered USD 22 million and the European Union, as well as other international donors, through the Green Growth Fund. The rest was funded by the GEDF and Georgian Oil and Gas Corporation (GOGC), the plant's owners. The overall cost of the facility was USD 29.7 million. Wind turbines had been installed by the world market leader in wind energy "Vesta Benelux". It should also be mentioned that this project was one of the best practices in terms of capacity building and logistics management, especially the part related to the installation of the turbines. In September 2019, the GOGC and GEDF announced a public auction to sell their 100% stake in this plant, and it has been sold for USD 14.4 million.

Qartli Wind power plant is a great example of the implementation of government's energy strategy, which envisages the development of low-emission electricity generation facilities and covering the energy demand of the country in the winter season partially by wind power.






projects and totally added 1 GWh/y of renewable energy with EUR 132.4 million. Besides hydropower projects they also supported the Qartli wind power farm with an installed capacity of 20.7 MW and 85,000 MWh/y of renewable energy produced on average. KfW, for example, provided EUR 8.4 million





to support Georgia’s energy sector reforms. There are various funding initiatives actively participating in Georgia and the Table 0-10 lists most of the ongoing projects funded by international funding organizations in Georgia.

Table 0-10 List of funding initiatives in Georgia

Project/Programme title	Short description of the Project/Programme	International funding organizations	Budget	Starting/ Starting and ending year
Green for Growth Fund Southeast Europe (GGF)	The Green for Growth Fund (GGF) is the first specialized fund to advance energy efficiency (EE) and renewable energy (RE) in Southeast Europe. GGF provides refinancing to Financial Institutions to enhance their participation in the EE and RE sectors and makes direct investments in Non-Financial Institutions with projects in these areas. The activities of GGF are supported by a Technical Assistance Facility for projects preparation.	European Investment Bank (EIB)  KfW Development Bank 	92.9 mil. USD for Georgia	2009 - 2025
Renewable Energy and Energy Efficiency Programme	The 40 million DKK Renewable Energy and Energy Efficiency Programme 2014-2017 (REEEP) is a component under the intervention area energy efficiency (EE) and green technology of Pillar 2 of the Danish Neighbourhood programme 2013-17, which aims at promoting sustainable and inclusive economic Development in the target countries.	Danish International Development Agency (DANIDA) 	3.7 mil. EUR	2014
Support to Energy Efficiency and Sustainable Energy in Georgia	The programme Support to Energy Efficiency and Sustainable Energy in Georgia consists of two development engagements with the overall objective of strengthening energy efficiency and sustainable energy in Georgia. This includes implementing energy reforms outlined in the EU Georgia Association Agreement.	Danish International Development Agency (DANIDA) 	0.8 mil. EUR	2015
Georgian Low Carbon Framework	Under the Georgian Low Carbon Framework, EBRD will provide financing of up to US\$ 120m for medium-sized renewable energy projects in Georgia. The projects under the Framework will encompass development, construction and operation of renewable energy generation projects in Georgia. The Georgian Low Carbon Framework will support investments in medium-sized renewable energy projects in Georgia. The projects under the Framework will support the Government strategy to foster low carbon generation, cover the country's seasonal winter demand and to support private ownership in the energy sector. The Framework will be instrumental in supporting the low carbon power generation as well as diversification of renewable energy sources in Georgia to include wind and potentially solar.	European Bank for Reconstruction and Development (EBRD) 	120 mil. USD	2015 – (tbd)



Project/Programme title	Short description of the Project/Programme	International funding organizations	Budget	Starting/ Starting and ending year
EU4Energy programme	<p>This programme is based on the long running INOGATE Programme and the lessons learnt from it. The objective of the overall proposed action is to support the sound elaboration and implementation of evidence-based, medium to long term energy policies in partner countries, based on improved use of statistics and sharing of best practice and EU experience.</p> <p>The EU4Energy Programme comprises the following five components: EU4Energy Data, EU4Energy Policy, EU4Energy Governance, EU4Energy Web Portal and EU4Energy Communication &amp; Visibility.</p>	<p>European Union (EU)</p> 	21 mil. EUR	2016 - 2020
EU4Energy: Covenant of Mayors East	<p>The programme supports small towns that have signed up to the Covenant of Mayors initiative to implement energy efficiency projects identified within their Sustainable Energy Action Plans (SEAPs), with grants as well as technical assistance.</p> <p>Grants awarded to 19 selected projects (11 projects in Ukraine, 3 in Moldova, 3 in Belarus, 1 in Armenia and 1 in Georgia) with grants range between 400,000 EUR and 1.2 mil. EUR.</p>	<p>European Union (EU)</p> 	14.2 mil. EUR	2016 - 2020
Enguri HPP Climate Resilience Upgrade	<p>The Project aims to make improvements to Enguri HPP to alleviate critical power shortage in Georgia at a low cost and to enhance the environmental benefits of the Enguri Hydro Power Plant facility.</p> <p>The project will be targeting further improvements to the reliability and operational performance of the Enguri power plant through a rehabilitation programme for the Enguri headrace tunnel and penstock.</p>	<p>European Bank for Reconstruction and Development (EBRD)</p>  <p>European Union (EU)</p> 	35 mil. EUR	2017
USAID's Energy Program in Georgia	<p>The project is aimed at supporting Georgia in energy market development per Georgia's obligations under the Energy Community Treaty. The goal of this program/project is to enhance Georgia's energy security through improved legal and regulatory framework and increased investments in the energy sector.</p> <p>USAID's Energy Program (UEP) is planned build the capacity of the Government of Georgia (GoG) and relevant institution(s) to evaluate the fiscal and long-term security impacts of regulatory changes, promote energy investments, primarily in variable</p>	<p>United States Agency for International Development (USAID)</p> 	7.5 mil. USD	2017

Project/Programme title	Short description of the Project/Programme	International funding organizations	Budget	Starting/ Starting and ending year
	renewable energy development, support integration of non-hydro renewable energy into the power system, and provide strategic advisory services to the GoG to increase Georgia's energy security.			
Power Grid Enhancement Project in Georgia	The main aim of the project is to support Georgian State Electrosystem (GSE) to implement reinforcement and enhancement of the electricity transmission grid in Georgia, contributing to a stable, reliable, cost-effective, and efficient national transmission grid as a critical component of the efficient market infrastructure and electricity trading. It will enhance the integration of renewable sources, especially hydro and wind, into the system. The project will also contribute to the resilience of the Georgian power sector by improving security of supply.	European Investment Bank (EIB)  KfW Development Bank 	210 mil. EUR	2019 - 2023
GGF Procredit Bank Georgia for financing green measures	On 30 December 2020, the Green for Growth Fund (GGF) approved a EUR 20 million loan to ProCredit Bank Georgia, one of the largest lenders in Georgia and a pioneer in the market offering specialised green lending products. The investment aims to help businesses and households' access to dedicated financing for energy and resource efficiency measures, especially during the COVID-19 crisis. The measures to be financed by this loan are estimated to result in 19,100 MWh of primary energy savings per year and are expected to reduce CO <sub>2</sub> emissions by 5,050 tons annually.	European Investment Bank (EIB)  KfW Development Bank 	20 mil. EUR	2020

### 1.2.6. Communication

Stakeholder involvement and communication with stakeholders are crucial at all stages of energy policy implementation. Around USD 4 billion investment projects in the energy sector, mostly related to large HPPs and pumped storage HPPs, were suspended by local population, green NGOs and activists. The Government of Georgia is therefore launching information and awareness campaigns for the citizens to understand the importance of the development of the country's energy sector and the future challenges that problems with energy security, high energy prices because of imports and grid related problems. Convincing messages to the public and the non-governmental sector, as well as to other stakeholders, is essential for gaining their confidence and their involvement. To mitigate resistance to e.g., hydropower projects, communication improvements with the local population, environmental organizations and all the other stakeholders are essential.

EU4Energy Communication & Visibility project is enhancing visibility and communication between the EU and beneficiary countries on EU-funded regional and bilateral cooperation in the field of energy. The project, which was launched in June 2017, aims to show case the benefits of EU support and to highlight the impact of EU energy cooperation on the daily lives of citizens in the beneficiary countries.

Among other things, the project is focused on the development of short and dynamic communication campaigns to emphasize EU energy policy and related EU support in the region (e.g., renewable energies, energy security, etc.).

## 1.3. Kazakhstan

### 1.3.1. Status

The republic of Kazakhstan, home to 18.7 million people, lies in northern Central Asia and is bordered by China to the east, Kyrgyzstan and Uzbekistan to the south, Russia to the north and Turkmenistan and Caspian Sea to the west. Kazakhstan plans to obtain 50% of its total energy consumption from renewable energy sources by 2050 and it positioned itself as a leader of the green agenda in Central Asia.

Kazakhstan leads the world in the production of uranium, and consistently ranks among the top 10 producing countries for coal and top 20 for oil. The country is the largest oil producer in Central Asia, with the 12<sup>th</sup> highest proved crude oil reserves in the world. The national energy report [23] shows that the oil and gas sector alone account for a fifth of the country's GDP (21.3% in 2018), about two-thirds of total export earnings (70% in 2018) and nearly half of state budget revenues (44% in 2018). One of Kazakhstan's key energy goals is to widespread gasification and its further utilization for power generation, in industry and in the residential sector. Progress has been achieved in Kazakhstan's gas network development, in 2016 three lines of the transnational Turkmenistan-Uzbekistan-Kazakhstan-China gas pipeline were completed. In 2018, Kazakhstan was the world's 9<sup>th</sup> largest coal producer. Kazakhstan is the major energy exporter, and its total energy production (167 Mtoe in 2019) covers more than twice its energy demand.

The Government of Kazakhstan has set ambitious long-term goals for transition to a green economy, where the main highlight is development of renewable energy sources. Coal fired power dominates the electricity generation and many of these facilities are technically outdated so upgrading such plants by introducing new technologies is essential to underpin future power generation and meet sustainable energy goals. The electric power sector is the third largest in the region with the total installed generation capacity reaching 21.9 GW. The cost of fuel resources and its availability makes the cost of generation notably low. In 1991 Kazakhstan was dependant on electricity imports from Russia and Central Asia (15% of total consumption), because of Kazakhstan's own generating capacities, as well as the extensive construction and modernization of its interregional power network infrastructure Kazakhstan became a net exporter of electricity. The most recent structure of electricity production is dominated by coal-fired generation (70%), followed by gas-fired plants (19%), hydropower plants (9%) and wind and solar plants (2%).

Over the past 6 years, the installed capacities of renewable energy facilities have increased almost 10 times, from 178 MW in 2014 to 1635 in 2020 (Table 0-11). Currently, there are 116 renewable energy power plants in the Republic of Kazakhstan with an installed capacity of 1,685 MW. The generation of green energy at the end of 2020 amounted to 3.24 billion kWh. In 2021, it is planned to put into operation 23 renewable energy power plants with a capacity of 381.1 MW.

Table 0-11 Current renewable energy sources statistics in Kazakhstan

Technology	Number of power plants (June 2020)	Total installed capacity (Q1 2020) [MW]	Generation of electricity by RES (2019) [kWh]
Wind Power Plants (WPP)	22	383.9	717.4
Solar Power Plants (SPP)	37	797.6	563.14
Small Hydropower Plants (HPP)	37	224.6	1105.3
Biogas Power Plants (BPP)	5	7.82	14.9
<b>TOTAL</b>	<b>101</b>	<b>1414</b>	<b>2,400.74</b>

The largest renewable energy projects are as follows:

- WPP Tsatek Green Energy: 50 MW
- SPP Baikonur Solar: 50 MW
- SPP Saran: 100 MW
- SPP Eneverse Kunkuat: 100 MW
- SPP M-Kat Green: 100 MW
- SPP KB Enterprises: 100 MW

The solar atlas of the Republic of Kazakhstan was developed in 2017 as part of the project of the Ministry of Energy of the Republic of Kazakhstan (MoE RK) and United Nations Development Programme (UNDP) within the project “Providing Assistance to the government of the Republic of Kazakhstan to Implement the Concept on the Transition of Green Economy and Institutionalize the Green Bridge Partnership Program”. According to the Concept of the Fuel and Energy Complex Development, the Republic of Kazakhstan has 2.5 billion kWh/year of solar energy potential with 2,200-3,000 hours of solar energy annually and even more in the southern regions.

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#### *BOX 5 - Construction of a 10 MW SPP in the Kyzylorda region*

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The construction of a 10 MW solar power plant in Zhanakorgan district of Kyzylorda region has been completed in March 2021, reported the Ministry of Energy [30]. The project was implemented by the HEK-Kt LLP, a subsidiary of the Russian company Hevel.

High-efficiency **solar modules with a solar tracking system** are installed. This highly efficient system increases the power generation by an average of 20-25% in comparison with the static method of arrangement of the photovoltaic system. During the SPP construction about 100 people were involved, and 10 permanent jobs were created on the project.

In 2020, Hevel Group of Companies build Kapshagai SPP (3 MW) and Sarybulak SPP (4.95 MW) in Almaty region in Kazakhstan. In the first quarter of 2021, Hevel commissioned “Shymkent” SPP in Shymkent (20 MW), “Kantau” SPP in Turkestan region (50 MW) and “Zhanakorgan” SPP in Kyzylorda region (10 MW). By the end of April 2021, the investor plans to put into operation “Shoktas” SPP (50 MW) and “Kushat” SPP (10 MW) in the Turkestan region. The main works have been completed at the facilities, and the process of commissioning is underway.

The total capacity of Hevel Group projects in the south of Kazakhstan will reach 148 MW. In total, as of October 2020, the total volume of the group’s projects in Kazakhstan is 248 MW.

Wind energy has the greatest potential among all the renewable energy systems in Kazakhstan. According to the Republic of Kazakhstan 2030 Concept of the Fuel and Energy Complex development, the country’s wind potential is 1,820 billion kWh/a of which around 920 billion kWh/a are technically feasible. Around half of countries territory has an average wind speed of about 4 to 5 m/s at the height of 30 meters.

The United Nations Development Programme (UNDP), the Global Environmental Fund implemented jointly with the Ministry of Energy of the Republic of Kazakhstan (MoE RK) the project “Kazakhstan Wind Energy Market Development Initiative” where the wind potential at various sites across the country was studied in accordance with the methodology for estimation of the wind potential. Based on this work the Wind Atlas of Kazakhstan was developed as well as the pre-investment studies for 15 sites.

The second largest source of renewable energy in Kazakhstan is based on hydropower with the share of around 10.9% (2017) of the country’s generating capacity. Kazakhstan has an estimated potential of 170 billion kWh/a of which around 62 billion kWh are technically feasible. Hydropower energy resources are distributed throughout the country with three areas having particularly large potential: Irtysh River basin, the southeast part of the country with the Ili river basin and the south parts of the country with the Chu, Talas and Syrdarya rivers.

The Republic of Kazakhstan is potentially very rich in terms of geothermal resources. Its geothermal resources with temperatures of 40°C to more than 100°C are estimated at around 10,275 billion m<sup>3</sup> by water rate and 97 billion tons of oil equivalent (2.8 billion TJ) by heat rate which is equivalent to the country’s estimated fossil fuel reserves. Geothermal sources are located primarily in western Kazakhstan and minority is in southern and central parts. About 4.3 GW of geothermal potential is technically feasible.

The Republic of Kazakhstan is a major producer of grain and other agricultural products which produces significant amounts of waste from crops and manure. Livestock waste is also a stable source of biomass for energy production. Household solid waste in larger cities is also potential source of energy. The volumes of waste or their geographic locations are still not available, however the potential clearly exists. The European Bank for Reconstruction and Development is implementing a project to assess the potential for biofuel production in Kazakhstan.

### 1.3.2. Targets

The Government of the Republic of Kazakhstan adopted **The Kazakhstan 2050 Strategy** [24] in 2012. The Strategy specifies the directions for the long-term economic development of the country. In 2013 **The Concept on Transition towards Green Economy until 2050** [25] was adopted with the ambitious goal of 2050 generation mix comprising 50% alternative energy sources that include gas, nuclear and renewable energy. The Green Economy Concept sets renewable energy sector targets in Kazakhstan:

- 3% share of renewable energy system in total electricity production by 2020
- 10% share of renewable energy in total electricity production by 2030
- 50% share of low-carbon alternative and renewable energy sources by 2050

Besides the renewable energy targets the concept also defined that the renewable energy should be developed through building wind and solar power plans and that the distributed power supply of remote areas enabled by the use of renewable energy sources will provide cheap electricity that will lead to establishment of new businesses, such as greenhouse facilities and free-range cattle rearing and improve the regions’ competitive edge.

In 2016 the Order of the Minister of Energy of the Republic of Kazakhstan No. 478 sets a target for renewable energy sector development by 2020 (Table 0-12) with the overall goal of increasing the total installed capacity of renewable energy to 1,700 MW by 2020 (3%).

Table 0-12 Renewable energy sector targets of the Republic of Kazakhstan

Indicator	Target
Share of electricity produced by renewable energy sources in the total volume of 2020 electricity production	3%
Total installed capacity of renewable energy sources by 2020, including:	1,700 MW
1) Wind power plants	933 MW
2) Solar power plants	467 MW
3) Hydro power plants	290 MW
4) Biogas power plants	10 MW

In 2018 **The 2025 Strategic Development Plan of the Republic of Kazakhstan** was approved by the Decree of the President of the Republic of Kazakhstan No. 636 and it sets the new target of 6% share of renewable energy in total electricity production by 2025.

According to the Ministry of Energy and The Kazakhstan Electricity Grid Operating Company (KEGOC) which is the system operator of the Unified Power System (UPS) of Kazakhstan, the plan is that Kazakhstan commissions up to 7.3 GW of new capacities as presented in the Table 0-13.

Table 0-13 Planned commissioning of new capacity [MW] (source: Electric capacity forecast balance for Kazakhstan unified power system for 2019-2025, Ministry of Energy of the Republic of Kazakhstan)

Service area	2019	2020	2021	2022	2023	2024	2025
North	946	1193	1911	2213	2278	3363	4034
South	523	1106	1257	1341	1368	1369	1495
West	260	688	974	1702	1712	1773	1796
Total	1729	2987	4141	5255	5358	6505	7325

In the next seven years Kazakhstan has planned to commission 2.6 GW of renewable capacities within the framework of Kazakhstan's renewable support and development program as presented in the Table 0-14. Out of the planned 2.6 GW, over 90% comes from solar and wind energy.

Table 0-14 RES-based capacities planned for Kazakhstan, 2019-2025 [MW] (Source: KEGOC FSC)

	2019	2020	2021	2022	2023	2024	2025
Area 1 (North-South)							
HPPs	90.9	116.7	152.1	193.8	219.8	219.8	219.8
WPPs	371.5	582.0	966.9	1148.7	1148.7	1148.7	1148.7
SPPs	439.9	872.1	1119.1	1119.1	1119.1	1119.1	1119.1
Biofuel power plants	1.1	6.1	15.8	15.8	15.8	15.8	15.8
<b>Total</b>	<b>903.3</b>	<b>1576.9</b>	<b>2253.9</b>	<b>2477.4</b>	<b>2503.4</b>	<b>2503.4</b>	<b>2503.4</b>
Area 2 (Western service area)							
WPPs	95.8	95.8	110.8	110.8	110.8	110.8	110.8
SPPs	2.0	2.0	2.0	2.0	2.0	2.0	2.0
<b>Total</b>	<b>97.8</b>	<b>97.8</b>	<b>112.8</b>	<b>112.8</b>	<b>112.8</b>	<b>112.8</b>	<b>112.8</b>
<b>Total in Kazakhstan</b>	<b>1001.1</b>	<b>1674.7</b>	<b>2366.7</b>	<b>2590.2</b>	<b>2616.2</b>	<b>2616.2</b>	<b>2616.2</b>

### 1.3.3. Jobs created

The creation of renewable energy facilities entails the creation of new jobs. During the construction of the 10 MW solar power plant in the Kyzylorda region (BOX 5) about 100 people were involved, and 10

permanent jobs were created on the project. In March 2021 Kazakhstan had 115 renewable energy projects developed and the sector created 1,3310 fixed jobs and created approximately 2,000 temporary jobs every year.

Based on the World Bank Gender Indicators, women’s labour force participation reaches 68%, compared to 78% for men, which is higher compared to the regional average for Europe and Central Asia. Lower levels of participation for women have been partly accounted for by a lower retirement age for women. Women are not well positioned to benefit from opportunities related to the development of renewable energy sources. The Ministry of Healthcare and Social Development anticipates that more than 10,000 vacancies will appear in the electricity supply sector in the following years, across almost all levels and occupations. Women are now only minimally represented in the energy sector and are particularly absent from the higher paying jobs. Few women possess the university and vocational skills training that would qualify them for positions in renewable energy systems engineering.

EBRD recently started funding the Programme for Supporting Renewable Energy and Promoting Gender Equality in Kazakhstan with USD 500 thousand. The programme is aiming at the fact that at the global level, the renewable energy sector is set to increasingly employ more people, thus presenting a brand-new opportunity for women to expand their skills and talents and participate in a high-value, high-growth economic sector. As part of this assignment, EBRD will assist the Republic of Kazakhstan, as well as the renewable energy companies, to promote women’s economic opportunities in the renewable energy sector in Kazakhstan.

1.3.4. Policy instruments and programmes

Kazakhstan is the founding member of the Eurasian Economic Union (EAEU) which initiated the common energy market, including the electricity market (established formally in 2019), as well as common natural gas, oil and oil and gas markets. The main objective of the EAEU is to have a common energy market to harmonize prices, tariffs, and downstream taxes, and uniform access to markets and infrastructure.

Table 0-15 List of energy sector institution of Kazakhstan

Institution	Description	Website
Ministry of Energy of the Republic of Kazakhstan (MoE)	The Ministry carries out the formation and implementation of state policy, coordinates the management process in the fields of oil and gas, petrochemical industry, hydrocarbon transportation, in the field of uranium mining, state regulation of the production of petroleum products, gas and gas supply, the main pipeline, electricity, heat supply in the part of heat and power plants and boiler houses producing thermal energy in the district heating zone, nuclear energy, development of renewable energy sources.	<a href="http://www.gov.kz">www.gov.kz</a>
Ministry of National Economy	The Committee on Regulation of Natural Monopolies and protection of Competition at the Ministry of National Economy approves the tariffs for natural monopoly entities (electricity transmission, heat generation, transmission, distribution and marketing) and public interest market entities (electricity retail sales).	<a href="http://www.gov.kz">www.gov.kz</a>
Ministry of Industry and Infrastructure Development	The Committee on construction, housing and utilities implements the state policy in the field of heat supply (district heating systems) and water supply. They are responsible also for the development of justification of investments in heat supply systems modernization and development. They are the operator of the “Nurly Zhol” program.	<a href="http://www.gov.kz">www.gov.kz</a>



Institution	Description	Website
Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan	The Ministry of Ecology, Geology and Natural Resources is a central executive body of the Government of Kazakhstan, providing services within the green economy, waste management (excluding municipal, medical and radioactive waste), environmental protection, control and supervision the rational use of natural resources, etc. The ministry defines the rules of forming of the list of the power making organizations using energy waste recycling and conducts auctions for projects on energy waste disposal.	<a href="http://www.gov.kz">www.gov.kz</a>
Financial Settlement Center of Renewable Energy LLP (FSC)	To create conditions for the development of the RES sector, there was an adoption of the mechanism of state support based on the implementation of a centralized purchase of renewable electric energy by single buyer. To implement this mechanism, System Operator (KEGOC JSC) created Financial Settlement Center of Renewable Energy. FSC carries out centralized purchase and sale of electric power, produced by renewable energy sources and delivered to the electric networks of the unified electric power system of the Republic of Kazakhstan.	<a href="http://www.rfc.kegoc.kz">www.rfc.kegoc.kz</a>
Astana International Financial Center (AIFC)	The Astana International Financial Centre (AIFC) plays one of the main roles in attracting financial resources. The AIFC provides structural framework for the advancement of green finance. To that end, the centre launched the AIFC Green Finance Centre to develop and promote green finance in Kazakhstan and neighbouring countries.	<a href="http://www.aifc.kz">www.aifc.kz</a>
Kazakhstan Electricity and Power Market Operator JSC (KOREM)	Joint-stock company Kazakhstan electricity and power market operator (KOREM) was established in accordance with the Decree "On additional measures to improve the efficiency of the wholesale market of electric energy and power" to further improve the wholesale market of electric energy and power. The Company's activities as a centralized trading market operator and auction organizer are directly prescribed and fully regulated by the Laws of the Republic of Kazakhstan "On electric energy" and "On support for the use of renewable energy sources".	<a href="http://www.korem.kz">www.korem.kz</a>
Kazakhstan Electricity Grid Operating Company (KEGOC)	The authorized capital of KEGOC was established by transferring the property of Kazakhstan Energo National Power Grid based on the list defined by the above stated resolution. The National Power Grid provides the electricity transmission from power producers with power delivery directly to the National Power Grid to wholesale customers connected to the grid (power distribution organizations, major customers). KEGOC was assigned the System Operator of Kazakhstan by the Minister of Energy of the Republic of Kazakhstan (order No.61 dated 17 October 2014).	<a href="http://www.kegoc.kz">www.kegoc.kz</a>

### 1.3.5. Main financing mechanisms

In 2014, the Resolution of the Government of the Republic of Kazakhstan No. 645 established feed-in tariffs for a period of 15 years. In 2017, the Law on Support for the Use of renewable energy sources was amended, introducing a mechanism for renewable energy auctions. The ceiling auction prices were set at the feed-in tariff level.

According to the Ministry of Energy [26], the international auctions in electronic format with a total capacity of 1.5 GW were held for renewable energy projects in 2018-2020. For 3 years, 25 auctions were successfully held. The auctions were attended by 172 companies from 12 countries. The auction system has made it possible to achieve a significant reduction in prices for renewable energy sources. The maximum reduction in tariffs for individual projects was 64% for solar power plants, 30% for wind power plants and 19% for hydroelectric power plants. As a result of the auction, 58 companies signed contracts with the single buyer of renewable energy for 15 years for a total capacity of 1,219 MW. About EUR 1.2 billion has been attracted to the renewable energy sector and about EUR 155 million in taxes will be paid from the constructed facilities. Investors from 10 countries of the world, as well as major financial organizations such as the EBRD, the ADB, the Asian Infrastructure Investment Bank, and the DBK are currently working in the "green" energy sector. Also, major oil companies, such as Eni,

Total-Iren, which have already implemented projects in Kazakhstan and have plans for further development of renewable energy projects, came as investors.

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*BOX 6 - Auctions for 50 MW solar power plant project in Shoulder Village (Turkestan Region)*

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New auction type, **project-specific auction** with project documentation, was introduced in 2019. The project-specific auction type assumes offering renewable energy projects where potential investors are provided in advance with detailed information on project parameters such as resource potential assessment, grid connection specifications, market research for the construction of a new plant, etc.

During 2019, a documentation package was prepared for the 50 MW solar power plant auction as part of the UNDP/GEF project “De-risking Renewable Energy Investments”. The project included resource potential assessment, land plot location, considering specifications and costs for purchase/lease of land plots, results of public hearings and preliminary environment impact assessment, power distribution schemes and grid connection specifications and other documents.

Fourteen companies registered in KOREM’s trading system to participate in the auction, however, because of the higher financial guarantee costs (5000 KZT per 1 kW), only seven companies were admitted to the auction. The auction was held in November 2019 and seven companies from six countries (Kazakhstan, Italy, Russia, Germany, China and the Netherlands) submitted 95 price quotations, with a starting auction price of 7.7 USD/kWh and a final price of 3.3 USD/kWh, 2.3 times lower.

#### 1.3.6. Communication

For successful transition to green economy, it is necessary to ensure availability of sufficient human resources and expertise, including relevant training of technical and management personnel. The Concept for transition of the Republic of Kazakhstan to Green Economy [25] stresses out the following activities related to communication necessary to fulfil the green energy targets:

- Train enough engineers in environment protection and resource productivity
- Conduct on-the-job training and advanced training of existing engineers in the areas of energy efficiency, agriculture and resource management
- It is necessary to fully include green topics in elementary and infant school curricula
- It is also necessary to conduct broad communication and education programs to increase the population’s awareness in the issues of resource usage and environmental problems

Various programmes are actively participating in this field i.e., UNDP/GEF funded project “Derisking Renewable Energy Investment aims at promoting private sector investment in renewable energy in Kazakhstan to achieve Kazakhstan’s 2030 and 2050 targets for renewable energy. The project targets both large-scale and small-scale renewable energy. In large-scale renewable energy, the project will promote Kazakhstan as a prime destination for international investment. In small-scale renewable

energy, the project will promote investment in “RES for urban life”, on-grid small-scale renewable energy applications, targeting urban households and businesses; and “RES for rural life”, both on-grid and off-grid small-scale renewable energy applications, targeting farms and rural SMEs.

## 1.4. Serbia

### 1.4.1. Status

Since 2013, when the A National Renewable Energy Action Plan was adopted, there has been a continuous growth of new capacities for the generation of electricity from renewable energy. This growth is more significant in terms of the number of newly built capacities rather than in terms of installed capacity. The main reason for this lies in the fact that this is a new market for Serbia, so the investors and international financial institutions are rather cautious with building larger renewable energy power plants. This is especially true for wind power plants since the largest WPPs before 2019 was Alibunar with 42 MW, however this changed in last two years since the newly build wind farms are already above 100 MW (e.g., WPP Kovačica with 104.5 MW and Čibuk 1 with 157 MW, both in operation since 2019). Around 250 renewable energy power plants with a total capacity of about 500 MW have been built so far and 65 power plants with a total capacity of 264 MW are under construction.

Serbia advanced significantly in the transposition of the renewable energy acquis with the adoption of additional secondary legislation (Table 0-17). It took several years for the new incentive system to be launched, then to build investor confidence in the functioning of the system, as well as to prepare suitable projects, especially projects for large power plants. Although some 500 MW of new capacity has been put into operation in the meantime, the share of RES in gross final energy consumption, as calculated in accordance with the rules of Directive 2009/28/EC, changes very little. The reasons for this lie in the fact that the gross final energy consumption has grown intensively since 2014 from 8.5 Mtoe to 9.6 Mtoe in 2018. The number of RES capacities built could not keep up with such an intense increase in consumption so the share of RES in 2019 was 21.4%, which is almost the same as the base year 2009 when it was 21.2% and which served to calculate the 2020 binding target of 27%.

In terms of electricity from renewables, the only significant deviations from the Action Plan occurred in the implementation of the project of construction of medium and large hydro power plants with a total capacity of 250 MW. These power plants were supposed to be built on a commercial basis and without special subsidies and incentives, however, due to the delay in the implementation of these projects, the expected energy to reach the 2020 target was not generated. Serbia planned to install additional 1,092 MW of renewable energy capacities to increase the share of renewables in its energy consumption from the current 21% to 27% in 2020, however this did not happen (official statistics for 2020 are not yet available).

Altogether more than a fifth of all Serbian households are currently linked to District Heating Systems, which are run by municipal district heating companies. The lack of investments, coupled with almost total reliance on fossil fuels have produced an urgent need for a comprehensive rethinking of the district heat production and distribution system. Waste from forestry and agriculture are suitable sources for producing energy from biomass.

At the end of 2019 Serbia adopted three by-laws on biofuels, which defined the share of biofuels on the market, the sustainability criteria and other requirements. In March 2020 the Rulebook on the calculation of the share of renewable energy sources in gross final energy consumption was adopted. Serbia is yet to transition from the feed-in tariffs for which quotas have been fulfilled to a market-based support scheme which is in a developing phase and is planned to be completed in 2021 meaning that the implementation could start soon. The legal and regulatory framework to implement renewable auction which are in line with the European State Aid Guidelines and the development of renewable self-consumption is the priority for Serbia at the moment.

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### *BOX 7 - Cibuk 1 - largest onshore windfarm in the Western Balkans*

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Cibuk 1 is a 158 MW onshore windfarm developed by Vetroelektrane Balkana and Wind Energy Balkan Group (WEBG) in Dolovo in Serbia, around 50 km north-east of Belgrade. It is the largest commercial windfarm in Serbia and the Western Balkans. The developers WEBG are entirely owned by Tesla Wind, a 60:40 joint venture between Masdar and Cibuk Wind Holding, a subsidiary of US-based developer Continental Wind Partners (CWP).

Construction on the EUR 300 million project began in 2015 and the plant become fully operational by 2019. Taaleri Aurinkotuuli, an investment fund company under the Taaleri Group, acquired 30% of the interest in the Cibuk 1 windfarm project in 2017. Deutsche Investitions- und Entwicklungsgesellschaft (DEG) acquired an equity interest of 10% in the project in 2018. Two International financial institutions namely European Bank for Reconstruction and Development (EBRD) and the International Finance Corporation (IFC) are together providing EUR 215 million for the project.

It is expected to provide electricity to approximately 113,000 homes and offset more than 370,000 tCO<sub>2</sub> emissions a year. The power generated by the Cibuk 1 windfarm is sold under a 12-year power purchase agreement (PPA) signed with a subsidiary of Elektroprivreda Srbije (EPS), a state-owned power company.

The Cibuk 1 windfarm covers an area of 37km<sup>2</sup> on which 57 wind turbines with a rated capacity of 2.78MW each are installed. The location of the turbines has been optimised to increase generation capacity and decrease the impact on the local environment.

The share of renewable energy sources in transport remains low (1.16% in 2018 while the target for 2020 is 10%).

#### 1.4.2. Targets

Serbia submitted its National Renewable Energy Action Plan as well as all three Progress Reports on implementation of the Renewable Directive to the Energy Community Secretariat by the required deadlines. With 21.4% of renewables in its energy mix in 2019, Serbia is far from its indicative trajectory and 2020 target of having 27% of renewables in its energy mix (Figure 0-12).

At the moment, the only existing support mechanism for renewable energy consists of feed-in tariffs and with that mechanism, Serbia so far supported the construction of 511 MW of various renewable energy capacities (Figure 0-11). A market-based support is about to be applied.

Total Capacities of Renewable Energy: **3491 MW**  
 Annual capacity change: **+ 166 MW**

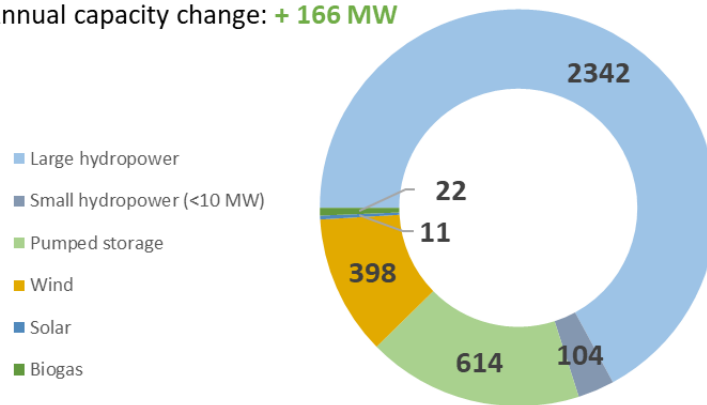


Figure 0-11 Total Capacities of Renewable Energy 2019 in Serbia (source: Energy Community Secretariat)

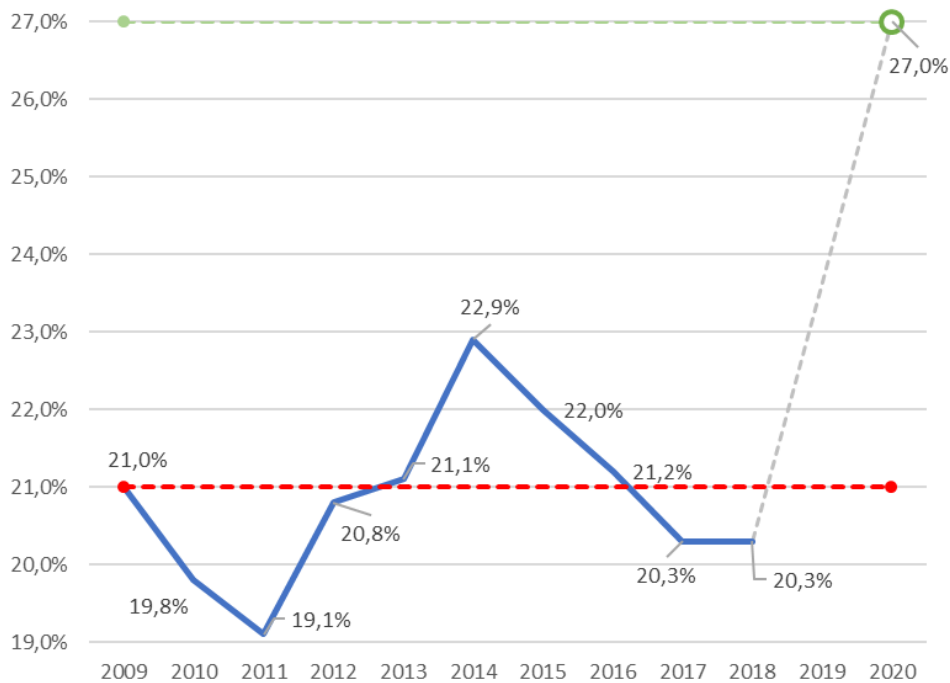


Figure 0-12 Shares of Energy from Renewable Energy Sources in Serbia (source: EUROSTAT and ECS [27])

In terms of target achievement, Serbia is lagging in all the sectors: electricity, heating and cooling and transport.

### 1.4.3. Jobs created

Building up the local workforce for renewable energy equipment and projects is an important element of renewable energy sector development, especially considering the socio-economic development opportunities and potential local support of the transformational change. Adequately skilled and locally available renewable energy experts working in various parts of the renewable energy value chain are crucial in supporting the transition that is inevitably happening all around the world. Institutions also need to have adequate capacity to fulfil their mandates and contribute to renewable energy growth and this includes having adequate capacities in policymaking and planning, data

collection and analysis, knowledge sharing with other institution including international agencies and consulting companies.

According to IRENA's analysis, a typical 50 MW solar PV project requires some 230,000 person days along the value chain [28]. Much of the workload (e.g., transport, construction, etc.) can be filled locally by the workforce of existing industries without having it sourced from outside of Serbia. This can immediately contribute to the local employment and income generation. Building the skills required for the operation and maintenance as well as installation might further enhance the local economy. The report also explains that over 70% of the workforce can be sourced locally. Similarly, a 50 MW onshore wind farm requires 144,000 person days out of which 43% is workforce for operation and maintenance, which can largely be locally sourced. Solar thermal technology manufacturing already started manufacturing various system components locally. Developing and manufacturing the solar PVs and wind energy technology is rather difficult and mostly produced in limited number of countries, however certain elements can still be manufactured locally.

In Serbia, at the policy level, the Department of Renewable Energy within the Ministry of Mining and Energy is responsible for participating in policy making and monitoring the situation in the field of renewable energy. Three civil servants are currently permanently employed in the Department of RES. The Job Classification Rulebook adopted in April 2019 reduced the number of positions in the Section of RES from 7 to 5 employees, whereas job titles were also degraded. Administrative capacity in the Section of RES, the number of currently employed and the number of classified jobs is not sufficient for the highly demanding work expected in this area, setting RES targets by 2030, defining measures and activities to achieve them, transposing the new directive in the field of RES, Directive 2018/2001/EU, as well as the development of a completely new legal framework to promote greater use of RES in Serbia.

#### 1.4.4. Policy instruments and programmes

The Republic of Serbia became an Energy Community member in 2006 after adopting the Law on ratification of the Treaty establishing the Energy Community between the European Union and the EC member states. By signing that Treaty, the Republic of Serbia has undertaken to implement European Directives in the field of renewable energy sources (Directive 2001/77/EC) on the promotion of electricity produced from renewable energy sources and Directive 2003/30/EC on the promotion of the use of biofuels or other renewable fuels for transport. As of 2009, the directives were gradually superseded and eventually repealed in January 2012 with the new Directive 2009/28/EC on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC. In October 2012 Republic of Serbia signed the Decision and set a very demanding and binding goal of achieving a 27% share of renewable energy sources in gross final energy consumption by 2020. The same Decision required preparation of the National Renewable Energy Action Plan of the Republic of Serbia which was adopted in June 2013 ("Official Gazette of the Republic of Serbia", No. 53/13). The Ministry in charge of activities in the energy sector is responsible for monitoring the National Renewable Action Plan implementation and must submit a report on its implementation to the Government. So far four reports were submitted and the latest Annual implementation report from the December 2020 [29] presents the status of alignment of the Serbian Energy Sector with the EU directives and the renewable energy implementation which is presented in the table below (Table 0-16).

Table 0-16 Renewable Energy Implementation in Serbia (source: Energy Community Secretariat [27])

Renewable Energy Indicators	Transposition Assessment*	Implementation status*	Description
National Renewable Energy Action Plan	✓	58%	Serbia submitted its NREAP as well as all three Progress Reports on implementation of the Renewables Directive to the Secretariat by the required deadlines. With 20.32% of renewables in its energy mix, Serbia is far from its indicative trajectory of 24.3% in 2018.
Quality of support schemes	✓	53%	At the moment, the only existing support mechanism for renewable energy consists of administratively set feed-in tariffs (FiT). With that mechanism, Serbia so far supported the construction of 511 MW of various renewable energy capacities, while an additional 300 MW is in the pipeline. A market-based support scheme is still not applied.
Grid integration	✓	64%	According to the Energy Law, priority dispatch of the electricity produced from renewable energy sources takes place. All producers under the FiT are exempted from balancing responsibility, which is not in line with the State Aid Guidelines. Rules and procedures for connection of renewable energy producers need to be improved. The legal and regulatory framework for self-consumption is missing.
Administrative procedures and guarantees of origin	~	84%	Serbia had several simplification rounds for administrative procedures including a few updates of the investors' guide for renewable energy projects. However, licensing remains lengthy, and a single administrative body is not established. Serbia designated a competent body, which established an electronic system for issuing, transfer, and cancellation of guarantees of origin.
Renewable energy in transport	✓	28%	In December 2019, Serbia adopted the necessary secondary legislation on criteria for biofuels and bioliquids. The share of renewable energy sources in transport remains low (1.16% in 2018 while the target for 2020 is 10%).

\* Methodology was developed by the Energy Community Secretariat

The Energy Law, adopted at the end of 2014, and the adoption of by-laws in the field of renewable energy in the past years have significantly improved and streamlined the legal framework. Until present, 252 power plants with a capacity of about 500 MW were built based on incentive measures. These capacities are significant for Serbia for two very important reasons: the first one is the contribution to the gradual reaching of the 27% share target, and the second is provided certainty for other investors as well that the Republic of Serbia is developing a stable investment climate and that it is a reliable partner for all those wishing to invest in areas of RES.

By the end of 2019, by-laws were adopted in the field of biofuels. The first was the Decree on the Share of Biofuels on the Market ("RS Official Gazette", No. 71/19). This Decree sets out in more detail the



share of biofuels on the market, the obligors of the system of placing biofuels on the market and their obligations, the measures and manner of placing biofuels on the market, the reporting in the system of placing biofuels on the market, the register of the obligors of the system of placing biofuels on the market and their reports, as well as other elements of the system of placing biofuels on the market. The second was the Decrees on the Sustainability Criteria for Biofuels ("RS Official Gazette", No. 89/19). This Decree specifies in more detail biofuel sustainability criteria, manner and procedure for verifying the fulfilment of biofuel sustainability criteria, reporting on biofuel sustainability criteria, and other elements related to the sustainability of biofuels. The third important document related to biofuels was the Rulebook on Requirements for Biofuels (Official Gazette of the RS, No. 73/19).

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#### *BOX 8 – 1.2 MW biogas plant in Serbia*

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In January 2021, Switzerland-based energy company MET Group has launched a 1.2 MW biogas power plant utilising residue agricultural biomass (mostly pumpkin pulp and wheat residues) in Novi Milosevo in Serbia. MET Group participates in the project through PEPO Energy, a joint venture with Serbian company Arhar Teh in which it holds a 51% stake. PEPO Energy is an investment worth €5 million, which will support over 30 jobs for the local community.

Currently the MET Group is building another 73 biogas power plants in Serbia, and with about 100 MW of capacity being installed in next two years. At the moment the country has 28 biogas power plants.

Serbia is relatively new in the biogas sector so the Serbian Biogas Association developed and published the "[Guide for Investors](#)" intended for all investors interested in constructing a biogas plant. The main purpose of the guide is to encourage investment in the sector.

In March 2020, the Rulebook on the calculation of the share of renewable energy sources was adopted ("RS Official Gazette", No. 37/20). This Decree prescribes more closely the method of calculating the share of energy from renewable sources in gross final energy consumption, the method of calculating electricity generated in hydro power plants and wind power plants, the energy content of transport fuels, the method of calculating the impact of biofuels and bioliquids and their comparable fossil fuels on greenhouse gas emissions, as well as a manner to calculate energy from heat pumps.

By adopting by-laws in the field of biofuels and adopting the Rulebook on the calculation of the share of renewable energy sources, the complete transposition of Directive 2009/28/EC into the legal system of the Republic of Serbia in the field of energy has been completed.

Table 0-17 Renewable energy secondary legislation status for Albania (last update 01.12.2020, source: Energy Community Secretariat [30])

Legal act	Primary legal basis	Bodies in charge		Adoption / validity status
		Adoption /Approval	Drafting	
National Action Plan for Renewable Energy Sources	Article 65	Government of Serbia	Ministry of Mining and Energy	Adopted / <a href="#">NREAP</a> , OG 53/2013
Regulation on the requirements and procedure for obtaining the status of privileged electricity producer, temporary privileged producer and producer of electricity from renewable energy sources	Article 74	Government of Serbia	Ministry of Mining and Energy	Adopted / <a href="#">OG 56/2016</a> , Updated: OG 60/2017, <a href="#">OG 54/2019</a>
Regulation on incentive measures for the production of electricity from renewable sources and from the highly efficient cogeneration of electricity and heat	Articles 80	Government of Serbia	Ministry of Mining and Energy	Adopted / OG 56/2016 Updated: OG 60/2017, <a href="#">OG 91/18</a>
Regulation on the Power Purchase Agreement	Articles 76, 77	Government of Serbia	Ministry of Mining and Energy	Adopted / <a href="#">OG 56/2016</a> Updated: <a href="#">OG 61/2017</a> , OG 106/2020
Regulation on Compensation for Privileged Electricity Producers	Article 79	Government of Serbia	Ministry of Mining and Energy	Adopted / OG 12/2016 <a href="#">OG 8/19</a>
Regulation on the amount of special incentive compensation in 2017	Article 79	Government of Serbia	Ministry of Mining and Energy	Adopted / OG 7/2017
Regulation on the amount of special incentive compensation in 2019	Article 79	Government of Serbia	Ministry of Mining and Energy	Adopted / <a href="#">OG 8/19</a>
Regulation on the amount of special incentive compensation in 2020	Article 79	Government of Serbia	Government of Serbia	Adopted / <a href="#">OG 8/20</a>
Regulation on Guarantees of Origin	Article 87	Government of Serbia	Ministry of Mining and Energy	Adopted / <a href="#">OG 82/17</a>
Rules on connection to the transmission network	Articles 117, 39	Energy Agency of the Republic of Serbia	Elektromreža Srbije (EMS)	Adopted / <a href="#">AERS Rules</a> , 414/2015 <a href="#">EMS Procedure</a> , 27.11.2015
Methodology on determining the costs of connection to the electricity transmission and distribution networks	Articles 50(11), 39(1)	Energy Agency of the Republic of Serbia on Compensation for Privileged Electricity Producers	Elektromreža Srbije (EMS)	Adopted / <a href="#">Rules</a> , OG 109/15
Regulation on criteria for sustainable biofuels	Article 340	Government of Serbia	Ministry of Mining and Energy	Adopted/ <a href="#">OG 89/19</a>
Regulation on share of biofuels in the market	Article 340	Government of Serbia	Ministry of Mining and Energy	Adopted / <a href="#">OG 71/19</a>
Rulebook on energy permit	Article 34	Ministry of Mining and Energy	Ministry of Mining and Energy	Adopted / <a href="#">OG 15/2015</a>
Rulebook on the method of calculation and presentation of the share of all types of energy sources sold in electricity	Article 87	Ministry of Mining and Energy	Ministry of Mining and Energy	Adopted / <a href="#">OG 96/2017</a>

Legal act	Primary legal basis	Bodies in charge		Adoption / validity status
		Adoption /Approval	Drafting	
Regulation on the calculation of the share of renewable energy sources	Article 67	Ministry of Mining and Energy	Ministry of Mining and Energy	Adopted / <a href="#">OG 37/20</a>

The Ministry of Mining and Energy has requested the preparation of several studies that will provide a realistic view of the technical potential for using RES to increase the share of renewable energy sources, as well as to look at realistic technically viable potentials for setting targets by 2030, namely:

- IPA project, development of the Cadastre of small HPPs, that assesses the available hydro potential for construction of hydroelectric power plants up to 10 MW (implementation is in progress)
- IPA project, assessment of biofuel production potential meeting the sustainability criteria (the project is in progress)
- Analysis of forest biomass potential (GIZ conducted a study in 2018)
- Agricultural biomass potential analysis (GIZ conducted a study in 2018)
- Analysis of the use of manure on small farms for energy purposes (GIZ conducted a study in 2018)
- Analysis of the capacity of the power system to import additional wind and solar energy, the analysis will be prepared in cooperation with the operators of the distribution and transmission systems
- Analysis of the possibility of using small photovoltaic cells with the possibility of reducing the bills for citizens by introducing the concept of so-called net-metering (USAID conducted a study for the Ministry of Mining and Energy during 2018)
- Implementation of the project Promotion of the use of renewable energy sources - Development of the biomass market in Serbia, which encourages the transition of fossil fuel-fired power plants to biomass, is in progress (implemented in cooperation with the KfW Development Bank of Germany)

In agreement with the Energy Community Secretariat, the plan was to conduct a survey on household biomass consumption in April 2020. However, due to the newly arisen circumstances caused by the corona virus, this research is delayed for the year 2021.

The Project “Rehabilitation of District Heating Systems in Serbia – Phase V” is a continuation of the EUR 101.42 million project “Rehabilitation of the District Heating System in Serbia (Phase I –IV)” that started in 2001 under which 22 out of 53 Serbian district heating companies have been rehabilitated. The new project shall be financed with EUR 30 million of KfW’s loan and EUR 2 million of grant provided by the German Government through KfW and shall include 8 more district heating systems. In July 2019, a Feasibility Study was completed and served as the basis for the Memorandum of Understanding signed between KfW and the Republic of Serbia on November 1, 2019. Based on this document the negotiations between the parties started and resulted by signing the Loan Agreement on December 18, 2019. The overall Project development objectives are that the consumers, the population and the environment benefit from a sustainable, efficient and reliable energy supply laying ground for the convergence of Serbia to the EU (against the background of the Environmental chapter of the Acquis Communautaire). However, the practical Project implementation start shall significantly depend on the current situation in Serbia and the world.

In May 2021 the Serbian Parliament ratified a new Law on the Use of Renewable Energy Sources. The purpose of this law is to stimulate the production of energy from renewable sources and new investments in this field of work in Serbia by introduction of new legal mechanisms. The new law supports the auction mechanism as the replacement for the feed-in-tariff system used so far.





#### 1.4.5. Main financing mechanisms





Serbia is yet to transition from administratively set feed-in tariffs, for which quotas have been fulfilled, to a market-based support scheme. The first step was the ratification of a new Law on the Use of Renewable Energy Sources which is one of the results of the project on the possible models for new support schemes that was initiated by the Ministry and is planned to be completed in 2021. Adoption of the necessary legal and regulatory framework to implement renewables auctions in line with the State Aid Guidelines and the development of renewable self-consumption is a priority for Serbia in the following years.



Administrative procedures for integration of renewables into the network, as well as potential financing mechanisms, should be streamlined and simplified by the establishment of one-stop shop.

There are various funding initiatives actively participating in Serbia and the Table 0-18 lists most of the ongoing projects funded by international funding organizations in Serbia.

Table 0-18 List of funding initiatives in Serbia

Project/Programme title	Short description of the Project/Programme	International funding organizations	Budget	Starting/ Starting and ending year
Green for Growth Fund Southeast Europe (GGF)	The Green for Growth Fund (GGF) is the first specialized fund to advance energy efficiency (EE) and renewable energy (RE) in Southeast Europe. GGF provides refinancing to Financial Institutions to enhance their participation in the EE and RE sectors and makes direct investments in Non-Financial Institutions with projects in these areas. The activities of GGF are supported by a Technical Assistance Facility for projects preparation.	European Investment Bank (EIB)  KfW Development Bank 	316 mil EUR Western Balkans	2009 - 2025
Combined Heat and Power Plant and Biomass Padinska Skela	This support by SECO to City of Belgrade regards a demonstration project that would produce heat and electricity (Combined Heat and Power Plant- CHP) from biomass waste (straw). The project's objective is to present a showcase of using biomass (wood) to produce heat and electricity. In doing so and by simultaneously implementing energy efficiency measures in selected public buildings, a substantial reduction of CO <sub>2</sub> emissions is planned to be achieved.	State Secretariat for Economic Affairs (SECO) 	30 mil. CHF (out of which SECO contribution: 10.4 mil. CHF)	2010 - 2019
Western Balkans Enterprise Development & Innovation Facility (WB EDIF)	Set up under the EU umbrella of Western Balkans Investment Facility, WB EDIF was launched in December 2012 by the European Commission, the European Investment Fund, the European Bank for Reconstruction and	European Union (EU) 	145 mil. EUR	2013 - 2027

Project/Programme title	Short description of the Project/Programme	International funding organizations	Budget	Starting/ Starting and ending year
	<p>Development (EBRD) and the European Investment Bank (EIB), acting as co-lead international financial institutions.</p> <p>This EB EDIF aims at increasing the financial resources made available to SMEs (not restricted to RES related SMEs) based in the Western Balkans, to support socio-economic development and EU accession across the region. The activities include SME equity financing, SME loan guarantee, SME lending and support services.</p>			
Western Balkans Investment Framework	<p>The Western Balkans Investment Framework (WBIF) is a joint initiative of the EU, international financial institutions (CEB, EBRD, EIB, KfW, World Bank and Agence Francaise du Development), bilateral donors and the governments of the Western Balkans which supports socio-economic development and EU accession across the Western Balkans through the provision of finance and technical assistance for strategic investments, particularly in infrastructure, energy efficiency and also private sector development.</p>	<p>European Union (EU)</p> 	600 mil. EUR	2016 - 2026
Renewable Energy for District Heating Program	<p>The program, which is co-financed with KfW, replaces fossil fuel fired boilers of the district heating systems of Serbian municipalities with boilers fired by biomass and geothermal energy. Additional measures will be implemented to strengthen the management capacities of the involved district heating companies.</p> <p>The project supports this transition via also enabling energy to be supplied by economically sound operating district heating companies, as well as through the associated stimulation of local value chains.</p>	<p>State Secretariat for Economic Affairs (SECO)</p> 	29.8 mil. CHF (out of which SECO contribution: 5.4 mil. CHF)	2016 - 2021
Green Economy Financing Facility (GEFF) for the Western Balkans	<p>EBRD's Green Economy Financing Facility (GEFF) provides finance for green economy investments in residential sector, as well as to businesses who supply energy efficiency and renewable energy products and services to households, in namely in Albania, Bosnia and Herzegovina, North Macedonia, Kosovo, Montenegro and Serbia.</p>	<p>European Bank for Reconstruction and Development (EBRD)</p> 	85 mil. EUR	2017 - 2020
Serbia - IPA Cadastre for Small Hydro Power Plants	<p>The overall objective of the project is reforming energy policy of the Republic of Serbia by meeting EU Acquis through increased use of renewable energy.</p> <p>The purpose of this contract is implementation of Serbian Energy Development Strategy in the renewable sector by encouraging and facilitating</p>	<p>European Union (EU)</p> 	1. mil. EUR	2017 - 2019

Project/Programme title	Short description of the Project/Programme	International funding organizations	Budget	Starting/ Starting and ending year
	investments in small hydro power plants potentials (SHPP).			
Serbia - Study on modalities to include electricity from RES into the distribution network and smart grids	The overall aim of the project is to increase share of renewables and other small, distributed generation in electricity sector. The project will support the integration of the distributed generation (mainly renewable sources) into the Serbian distribution grid and strengthen the capacities of the local distribution companies to connect it to the existing network. Improvements in the network such as integration of smart grid technologies and charging stations for plug-in electric vehicles will be analysed too.	European Union (EU) 	1 mil. EUR	2018 - 2020
Serbia - Technical Assistance to the Ministry in Charge for Energy and Relevant Public Entities, NEEAP and RES Directive	The overall objective of the project is to contribute to the security of supply, more competitive energy market and sustainable energy development. The purpose of this contract is to improve policy enforcement, monitoring and harmonisation of national legislation in line with the EU Energy Acquis and commitments for Energy Community.	European Union (EU) 	1.5 mil. EUR	2018 - 2020

#### 1.4.6. Communication

Communication and visibility are of high importance during the implementation of any kind of energy transition actions. Visibility and communication action demonstrate how sustainable energy interventions contribute to the green agenda objectives. Communication actions should always be aimed at strengthening general public awareness and support of renewable energy interventions financed and the objectives pursued.

European Union for example supports Serbian energy sector transition through the Instrument for Pre-accession Assistance (IPA II) 2014 – 2020. The key focus of the action is to contribute to a more reliable and safer security of energy supply. Targeted communication activities will be designated to ensure the visibility of support, of beneficiaries, achievements and the fact of EU funding. The Action may multiple public events and awareness rising activities, such as kick-off and closing ceremonies, events at the occasion of signing contracts, etc. All the events shall be organized in a manner to promote joint visibility features of the Action and to inform the broader audience on objectives and achievements of the Action by timely involvement of the media and via broadcasting through appropriate communication channels.

## Recommendations to key issues and bottlenecks in financing renewable energy investments

The renewable energy market in selected four countries has experienced progressive growth. This progress includes creating the necessary regulatory framework and adopting targets, policies and regulations. Governments of the four countries share a variety of energy challenges, which could become drivers for renewable energy deployment as the countries embrace a more active approach through renewable energy policies. By the end of 2019 (official statistics for 2020 are not yet available) the total installed renewable power capacity in the four selected countries is more than 10.5 GW of installed capacities where Serbia leads with 3,491 MW and is followed by Georgia with 3,337 MW, Albania with 2,591 MW and Kazakhstan with 1,050 MW installed renewable energy capacity.

Detailed, accurate and timely data and statistics are essential for the monitoring and evaluation of renewable energy policies and deployment. Even though the official statistics for 2020 are still missing, most probably none of the four countries has fully reached its 2020 targets. To reach the targets, massive reallocation of capital toward renewables is required as well as mobilization of all available capital sources. The following table lists the recommendations based on the key issues and bottlenecks regarding financing of renewable energy investments.

Recommendations	Short description	Relevant stakeholders
<b>Strategic planning and ambitious renewable energy targets at the national level</b>	All four countries lack strategic planning documents that would outline the energy sector's long-term development path and that would account for new socio-economic realities, interests of related industries, the opportunities for technological and innovative energy sector development, as well as energy security and environmental policy goals. The policy makers and energy sector regulators should have a clear and realistic long-term energy development programme. Strategic planning needs to look ahead to a time when renewable energy deployment is already found everywhere and design the markets and systems around such a future. Setting ambitious renewable energy targets consistent with the long-term national energy strategy and action plans sends a strong signal to investors and can help attract additional capital.	Policy makers at the national level, local and regional public authority, sectoral agencies, infrastructure and utility companies, higher education and research, large enterprises and citizens
<b>Strategic planning and ambitious renewable energy targets at the regional level</b>	Besides the national strategy and action plans, it is important to develop strategic documents at the regional level because regions should be the hub for a radical rethink of public fund use and energy planning approach in a more decentralised and smarter way. The capacities should be boosted at the regional level to mobilise investments addressed to reach 2030 energy targets more efficiently. The energy planning should have a holistic view of the energy system, considering supply, demand and distribution opportunities provided by smart networks and storage for each technology investigated. A participative consultation of relevant stakeholders and regional public support is also important and can drive the selection of the key technologies' priorities.	Local and regional authority, local energy agencies, local infrastructure and utility companies, higher education and research and citizens
<b>Renewable energy spatial planning</b>	The development of renewable energy has both positive and negative effects on biodiversity. The transition from fossil-fuel based energy generation to renewable energy generation will require a greater land footprint, leading to trade-offs on land use and potentially exacerbating land use conflicts. This footprint can impact on critical habitat for biodiversity and destroy carbon sinks that if remained intact, help curb the impacts of climate change. All four analysed countries have a rich biodiversity and large areas designated for its protection which impacts on RE siting and possible conflicts with nature preservation.	Policy makers at the national level, local and regional public authority, sectoral agencies, infrastructure and utility companies, higher education and research, business support

	<p>The first step is guiding production onto previously converted or degraded lands so that the impact on high value ecosystems can be avoided. Access to data on biodiversity and social and cultural values is critical and the governments should develop platforms to make such data available. The spatial modelling can offer different energy siting scenarios based on viable solar and wind resource availability, overlaid with the potential environmental and societal impacts that may result from RE development. To accelerate the build-out of renewable technologies, all four analysed countries should map the priority areas for solar and wind farms with the lowest environmental and social conflict potential and the highest resource potential as well as assess the current hydropower generation and storage capacities to support the wind and solar power expansion.</p>	<p>organizations and citizens</p>
<p><b>Support schemes based on feed-in premium</b></p>	<p>A feed-in premium for the operational support is most suitable to replace the existing feed-in tariffs granted on the first-come, first-served basis. The premium that is granted through a tendering process is compatible with the internal market principles and will lead to a phase-out of the subsidies needed overtime while several technologies will reach market parity.</p>	<p>Policy makers at the national level, sectoral agencies, various professionals in the energy industry and higher education and research</p>
<p><b>Establishment of the renewable energy operator</b></p>	<p>The appointment of an institution to manage the support scheme for renewable energy producers is instrumental in ensuring the viability of the scheme. Such central counterparty role can be entrusted to either the market operator, transmission system operator (TSO) or to an institution legally separated from the TSO. The electricity market operator should have a specific role in the electricity market and for market coupling or in managing the access to the grids (in the case of TSO).</p>	<p>Policy makers at the national level and transmission system operator</p>
<p><b>Renewable energy heating and cooling</b></p>	<p>District energy systems should be included in the national energy strategies and climate plans as well as renewable energy action plans. Governments should also end subsidies for fossil fuels, such as replacing gas boilers with more efficient ones as they are not compatible with the climate targets. The local heating and cooling plans at the cities level should have a clear picture on available local sources, challenges and opportunities as well as project implementation support. Such heating and cooling sector planning should also be obligatory for all the cities over 50 thousand inhabitants as well as aggregated planning at the regional level so that multiple cities with similar technical possibilities would be bundled. The data critical for heating and cooling planning should be available to cities by the utilities that are serving the city. It is also very important to include citizens as well as other relevant stakeholders from planning onwards all the way through the implementation of the project. The renewable energy supply for such heating and cooling systems can come from various renewable energy sources such as geothermal or solar but also waste heat could be considered.</p>	<p>Policy makers at the national level, local and regional public authority, sectoral agencies, infrastructure and utility companies, higher education and research, business support organizations, Small and Medium-size Enterprises (SMEs) and other energy professionals, large enterprises and citizens</p>
<p><b>Green bonds</b></p>	<p>Green bonds represent the major opportunity to attract the private capital of various investors in the renewable energy sector. To further increase green bond issuances and strengthen their credibility among market participants a coordinated actions is need among policymakers, capital markets, issuers, and investors. The first step is to standardise green bonds to lower the risk of providing misleading information regarding the environmental friendliness of such services. Second step is that government should support the green bond market development via technical assistance and economic incentives and should assure the long-term sustainability. The final step is to create bankable project pipelines via de-risking renewable energy assets [31].</p>	<p>Policy makers at the national level, financial institutions and banks, sectoral agencies and higher education and research</p>
<p><b>New technologies - energy storage</b></p>	<p>To increase the share of renewables in the electricity mix, to contribute to climate change mitigation and the security of supply it is important also to foster private investments in the electricity sector and this includes implementation of new technologies such as energy storage. The first step is to assess the opportunity of energy storage in the context of the power system by analysing technical, environmental, economic, fiscal, and financial standpoints on the electricity market.</p>	<p>Higher education and research, sectoral agencies, interest groups, business support organizations, SMEs and professionals in the power sector</p>



	<p>The second step would be to develop the guidance and tools for the authorities for the sustainable implementation of an energy storage strategy. This would include the regulatory framework, pricing of grid services and many other technical, legal, and financial aspects. The energy storage roadmap would be based on several scenarios to be agreed upon with the key stakeholders with timeline horizons of 2030 and 2040.</p> <p>The outcome of such a thorough analysis would be the list of locations and the technical characteristics of suitable energy storage facilities that are economically justified and identified so that the private investors would be able to invest in such facilities.</p>	<p>industry, large enterprises</p>
<p><b>Post COVID-19 crisis</b></p>	<p>The recovery from the COVID-19 crisis presents governments and investors with an opportunity to accelerate the deployment of renewable energy technologies. Renewable energy investments undertaken as a short-term response to the crisis impacts can have the effect of supporting increasingly ambitious long-term targets for renewables, strengthen climate commitments, creating employment and stimulating economic growth.</p> <p>The COVID-19 crisis however set additional constraints on public resources so the limited public capital should primarily be used with the specific purpose of crowding in additional private finance.</p>	<p>Higher education and research, sectoral agencies, interest groups, business support organizations, SMEs and professionals in the power sector industry, large enterprises Policy makers at the national level, local and regional public authority, SMEs, large enterprises and citizens</p>

## Conclusions

The four selected countries are gradually moving towards more sustainable energy systems and the renewable capacity is growing but at a slow pace. Renewable energy markets continue to grow in all selected countries, with new developments arising in the power, heating and cooling, and transport sector, where further developments beyond traditional technologies are occurring. Even though the official statistics for 2020 is not yet available, most probably none of the four countries has reached its 2020 targets. The 2030 targets are not yet officially defined but based on the latest IPCC Report that addresses the most up-to-date physical understanding of the climate system and climate change (Climate Change 2021: The Physical Science Basis [32]) these targets will have to be highly ambitious and moving all four countries towards climate neutrality by 2050.

Except for Kazakhstan, which is a net energy exporter, energy import dependency dominates in the other three countries. Awareness and lack of understanding of renewable energy are additional obstacles to further development of renewables in the region. Overall, it remains a challenge to build sustainable and resilient energy systems that offer reliable and affordable energy to fuel the region's future economic growth. In 2019, Albania had the highest share with 33% of energy from renewable sources, it is followed by Georgia with 28% and Serbia with 20% and Kazakhstan with slightly more than 2% of renewable energy in the total final energy consumption. In terms of target achievement, all four countries are lagging in all the sectors: electricity, heating and cooling and transport. Selected countries have not done much regarding renewable energy in the heating and cooling sector nor in the transport sectors. Electric mobility promotion programs are emerging; however, this is still negligible.

In the power sector, hydropower continues to generate a large share of electricity in the four selected countries, most of these facilities were built before 1990. Both Albania and Georgia traditionally depend almost exclusively on hydropower for its electricity generation which makes both countries highly vulnerable to variable and unfavourable hydrological conditions, especially during the summer season. There is certain progress with the focus on wind and solar energy systems, however still a lot needs to be done in order to boost renewable energy investments. By the end of 2019, the total installed renewable power capacity in the four selected countries is more than 10.5 GW of installed capacities where Serbia leads with 3,491 MW and is followed by Georgia with 3,337 MW, Albania with 2,591 MW and Kazakhstan with 1,050 MW installed renewable energy capacities. In South-Eastern Europe, Albania and Serbia have the potential for cost-competitive deployment of solar and wind power generation. However, renewable energy is being challenged politically and financially, especially having in mind the cost of government support policies. In the Caucasus, Georgia is moving slowly from hydropower to other renewable energy sources with only one 21 MW wind power plant running and few minor solar power plants. In Central Asia, in Kazakhstan, the country with by far the largest potential for renewable energy deployment due to its size, there are plans to install numerous renewable utility-scale power generation projects, based on government support combined with financial mechanisms of various development banks. Most of investments in all four countries are still driven by international donors and development banks which are, jointly with foreign private companies, developing and installing new renewable energy capacities.

In the heating sector, both Albania and Serbia could expand the usage of solar water heating system, geothermal energy as well as deployment of efficient biomass systems. The district heating systems are mostly based on hydrocarbons and coal/lignite or inefficient use of wood which is a significant contributor to air pollution and GHG emissions so the potential of using renewable energy (biomass, waste heat, etc.) should further be investigated and pilot projects should be implemented.

All countries analysed in the report developed its primary legislation related to renewable energy sources and are slowly adopting the necessary secondary legislation (detailing legal, regulatory and financial mechanisms and technical rules) that will ensure the full implementation of renewable energy sources. Albania, Georgia and Serbia, as members of the Energy Community, are still aligning its legislation with the legal framework of the EU and their governments aim to establish clear and transparent responsibilities for the implementation of the EU *acquis*. A market-based support scheme is still not applied in Albania, Serbia nor Georgia but only in Kazakhstan where the auction mechanism was introduced at the end of 2017 to replace feed-in tariff measures. The successful 2018-2019 auction results show the effectiveness and timeliness of the transition from feed-in tariffs to the auction mechanism, following international best practice.

International donors and development banks continue to be an important source of debt financing and grants for renewable energy projects in all four countries. In recent years, the four selected countries also managed to attract foreign investments for renewable energy projects, and this was mostly visible in Serbia with newly built wind power plants and Kazakhstan with both solar and wind power plants. Integrating renewable energy into the design of projects with multiple benefits could expand the opportunities for financing from different sectors (e.g. water, agriculture) and from cross-cutting sources, e.g. related to climate financing. Furthermore, cross-border cooperation may provide opportunities for regional projects and upscaling. In Serbia and Albania such opportunities have emerged in nexus (cross-sectoral) projects, linking also to water cooperation, and have been highlighted as possible nexus investments. In Central Asia, Kazakhstan, a country with by far the largest potential for renewable energy deployment due to its size, there are plans to install numerous renewable utility-scale power generation projects, based on government support combined with financial mechanisms of various development banks. Most of the investments in all four countries are still driven by international donors and development banks which are, jointly with foreign private companies, developing and installing new renewable energy capacities.

The future activities in all four countries need to contribute to the development of sound legislative and regulatory frameworks for energy in order to support the transition to clean energy and the liberalisation of the energy market. International donors and their programmes and projects related to renewables need to highlight the importance of collaboration and cooperation between all the relevant stakeholders including implementing partners and beneficiary institutions in implementing reforms and bringing concrete benefits to citizens. This also includes the gender equality, emphasising the importance of women's engagement in the energy sector and their potential to take on leadership roles. Improved strategic planning and much more ambitious renewable energy targets need to be defined at the national level, while clear action planes must be developed at the regional and municipal level. This also involves the development of spatial models clearly presenting solar, wind and geothermal availability, overlaid with the potential environmental and societal impacts that may result from renewable energy development.

The findings of the study provide contribution to the future work of the GERE. It provides policymakers with information about how they can support the transition to a more sustainable energy that can also be integrated into the design of projects with multiple benefits combining different sectors such as water or agriculture. It will also help achieve the United Nations Sustainable Development Goals (SDGs) and will support climate change adaption and mitigation by reducing greenhouse gas emissions.

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