

UPDATE ON DEVELOPMENTS  
ON REGULATORY FRAMEWORK REGARDING  
RENEWABLES AND FLEXIBILITY

April 2023

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# I. INTRODUCTION

## 1. About ECRB

The Energy Community Regulatory Board (ECRB) operates based on the Treaty establishing the Energy Community (hereinafter ‘the Treaty’). As an institution of the Energy Community<sup>1</sup> (EnC), ECRB advises the Energy Community Ministerial Council and Permanent High Level Group on details of statutory, technical and regulatory rules and makes recommendations in the case of the cross-border disputes between regulators.

ECRB is the independent regional voice of energy regulators in the Energy Community. ECRB’s mission builds on three pillars: providing coordinated regulatory positions to energy policy debates, harmonizing regulatory rules across borders and sharing regulatory knowledge and experience. ECRB is committed to continue and strengthen the well-established streams of cooperation with the Agency for the Cooperation of Energy Regulators (ACER), the Council of European Energy Regulators (CEER) and the Association of Mediterranean Regulators (MedReg)<sup>2</sup>.

## 2. Scope of the report

Enabling the large-scale deployment of renewable energy sources (RES) is one of the most important measures to delivering greenhouse gas (GHG) reduction targets. However, due to the intermittency of RES generation, a number of technical and regulatory challenges arise with the need to make the system more flexible and balanced. This report explores the regulatory aspects, including the development of a regulatory framework in Contracting Parties related to the balancing responsibility of RES producers in 2021<sup>3</sup>.

## 3. Methodology

This report is based on the information and data provided by the National Regulatory Authorities (NRAs) of the Energy Community Contracting Parties and Armenia, as an Observer to Energy Community. For this purpose, a questionnaire was prepared and circulated to the NRAs of Albania, Bosnia and Herzegovina<sup>4</sup>, Georgia, Kosovo\*<sup>5</sup>, Moldova, Montenegro, North Macedonia, Serbia and Ukraine.

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<sup>1</sup> [www.energy-community.org](http://www.energy-community.org) The Energy Community comprises the EU and Albania, Bosnia and Herzegovina, North Macedonia, Georgia, Kosovo\*, Moldova, Montenegro, Serbia and Ukraine. Armenia, Turkey and Norway are Observer Countries.

<sup>2</sup> For more information on ECRB visit <https://www.energy-community.org/aboutus/institutions/ECRB.html>

<sup>3</sup> Some information in the Report is updated to reflect the data from 2022, as noted throughout the report.

<sup>4</sup> For Bosnia and Herzegovina, some aspects of the information are presented separately for the BIH entities: Federation of the Bosnia and Herzegovina and Republika Srpska, while the other aspects are presented in general for the whole country.

<sup>5</sup> Throughout this document, this designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Advisory Opinion on the Kosovo\* declaration of independence.

## II. COMPARATIVE ANALYSIS

### 1. Installed production capacity by technology

Since the choice of generation technologies was mainly based on the availability of primary energy sources, the overview of the generation mixes shows a diversity of shares of different technologies among Contracting Parties. However, two technologies are dominant in their generation mixes, namely: coal-fired thermal power plants (TPPs) and hydro power plants (HPPs), with exception of Ukraine where major energy source is nuclear generation in addition to thermal, in terms of output. The increasing penetration of intermittent RES, namely solar photovoltaic, and especially wind power plants (WPPs) is evident. In the Armenia, gas-fired TPPs are the most dominant in the generation energy mix.

The following figures demonstrate the installed capacities by generation technology for each Contracting Party and Armenia and in total for the Energy Community.

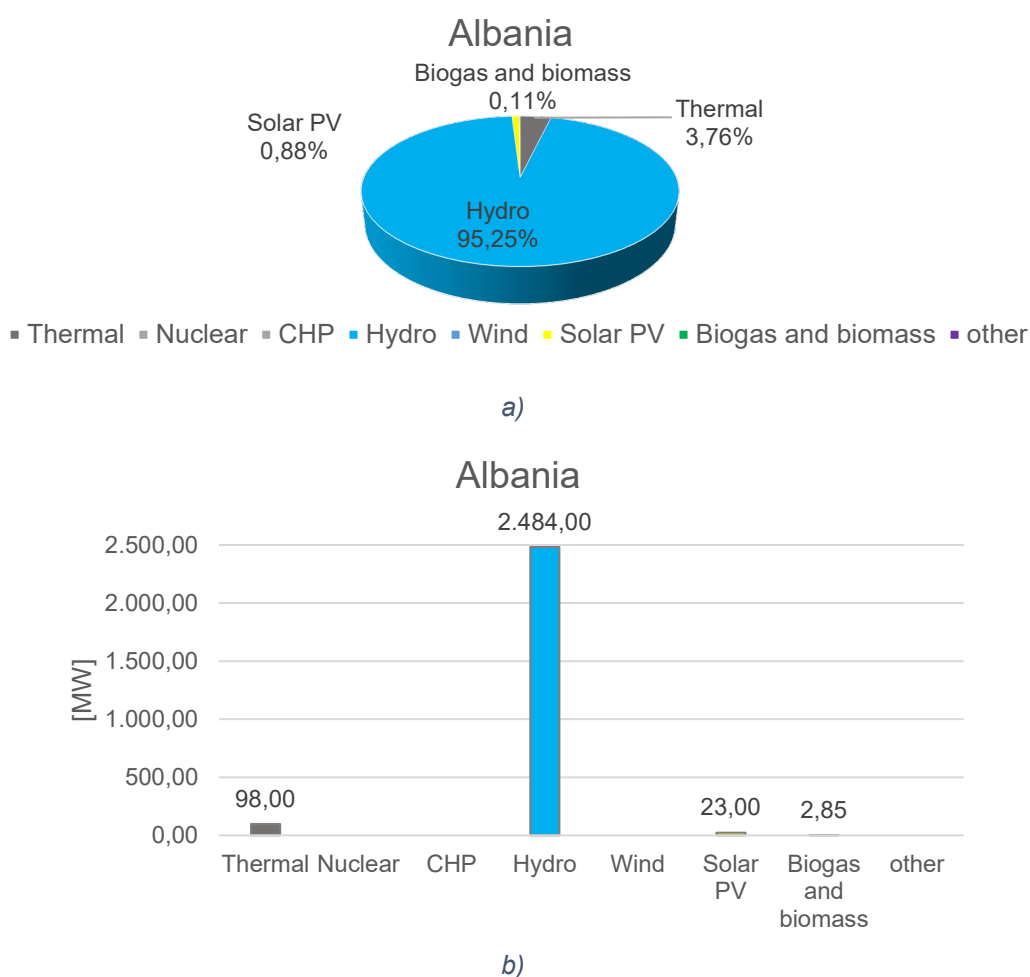
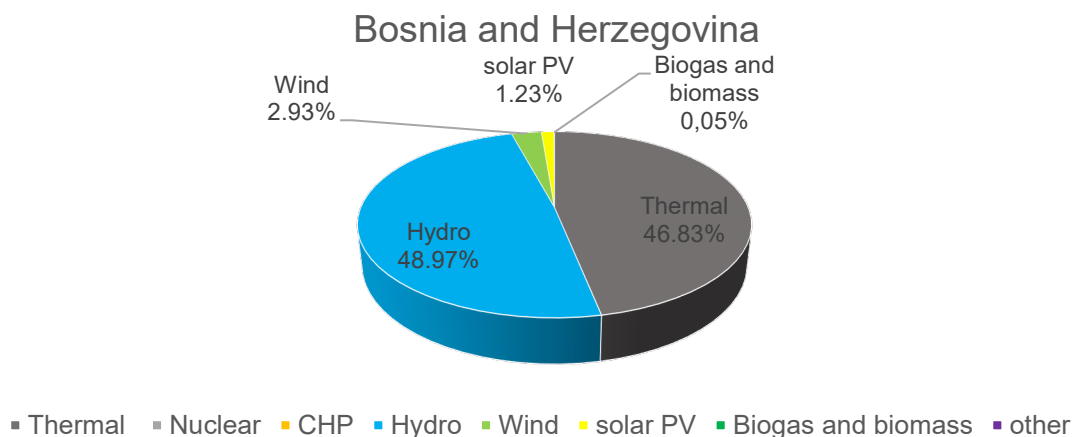
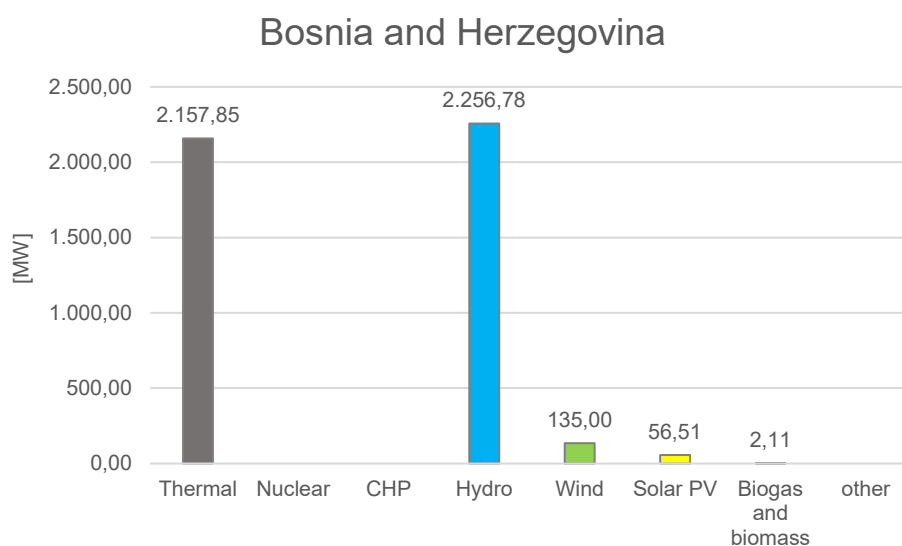


Figure 1 Generation mix of Albania at the end of 2021: a) share of each generation technology, b) installed capacities in MW by each generation technology<sup>6</sup>

<sup>6</sup> TPP Vlora (98MW) is in conservation status for more than 10 years now.

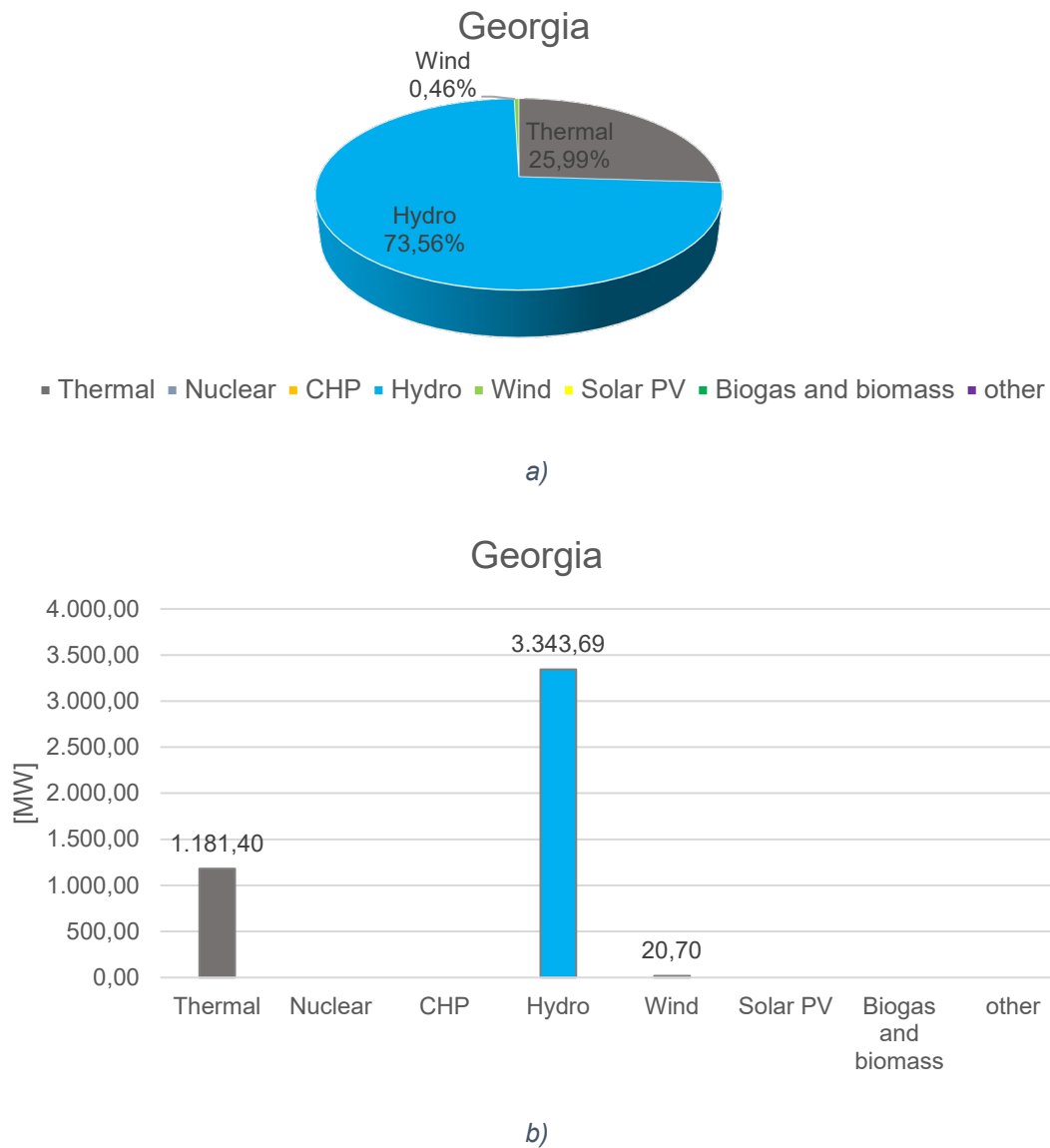


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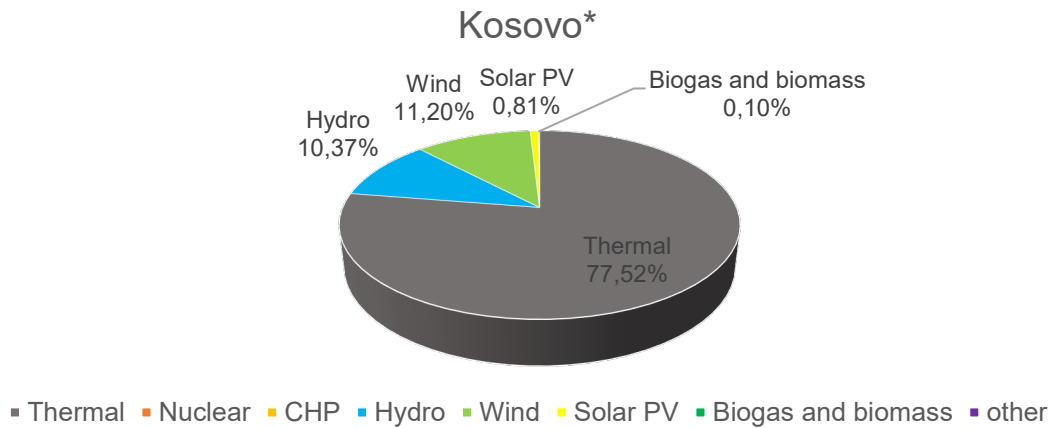


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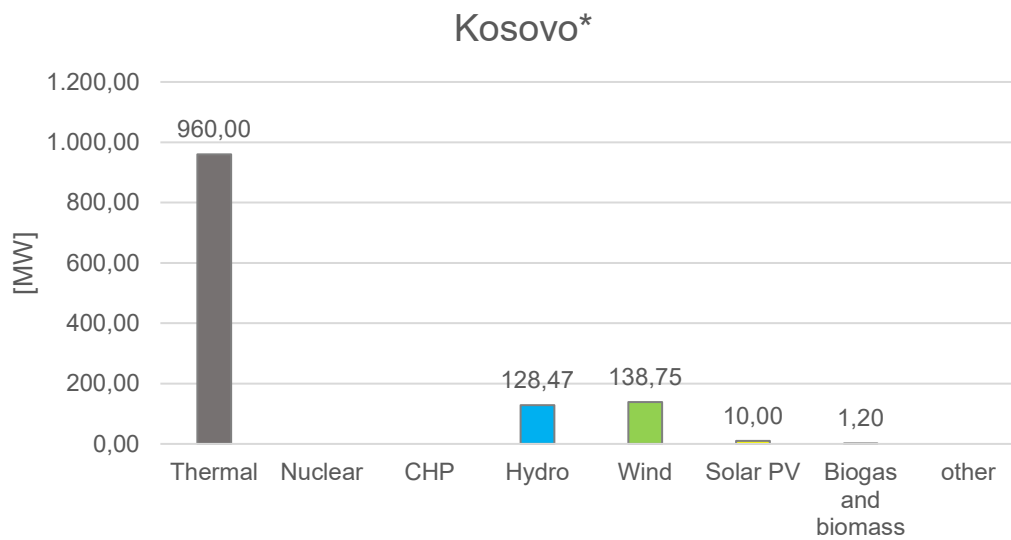
Figure 2 Generation mix of Bosnia and Herzegovina at the end of 2021: a) share of each generation technology, b) **installed** capacities in MW by each generation technology



*Figure 3 Generation mix of Georgia at the end of 2021: a) share of each generation technology, b) installed capacities in MW by each generation technology*



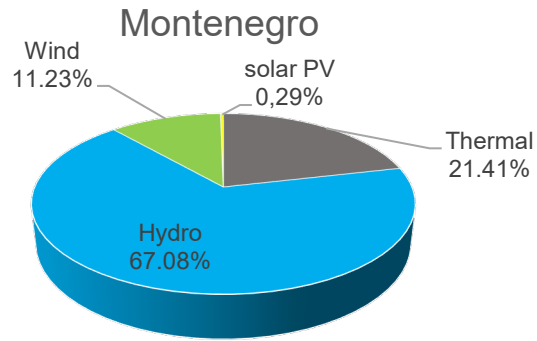
a)



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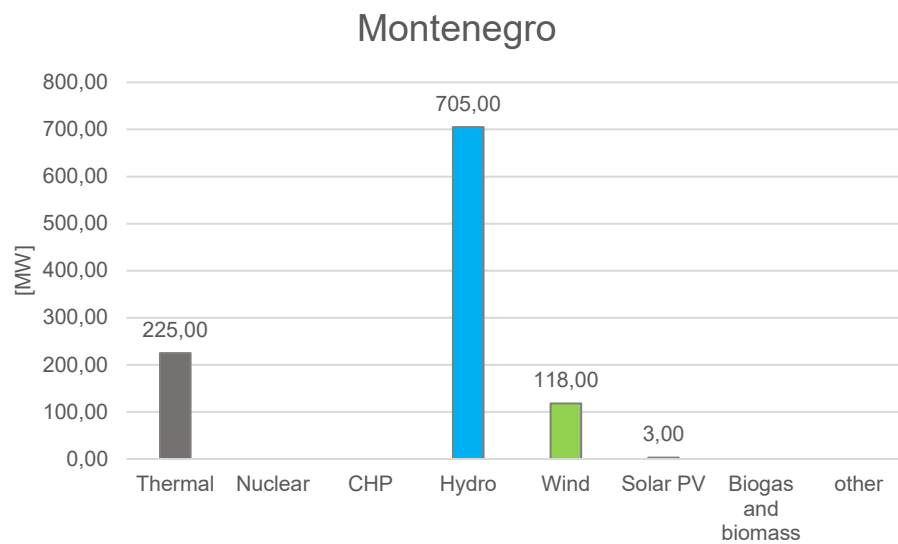
Figure 4 Generation mix of Kosovo\* at the end of 2021: a) share of each generation technology, b) installed capacities in MW by each generation technology





■ Thermal 
 ■ Nuclear 
 ■ CHP 
 ■ Hydro 
 ■ Wind 
 ■ solar PV 
 ■ Biogas and biomass 
 ■ other

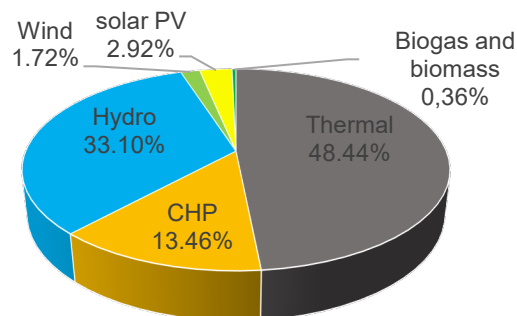
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Figure 5 Generation mix of Montenegro at the end of 2021: a) share of each generation technology, b) installed capacities in MW by each generation technology

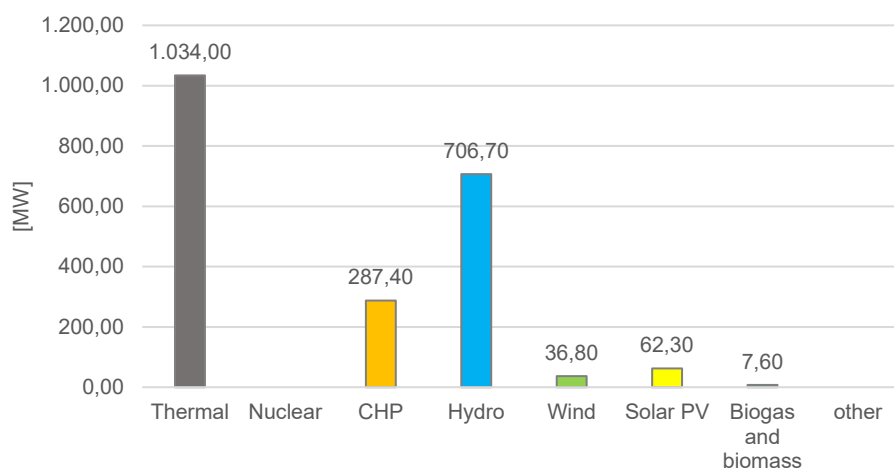
### North Macedonia



■ Thermal ■ Nuclear ■ CHP ■ Hydro ■ Wind ■ solar PV ■ Biogas and biomass ■ other

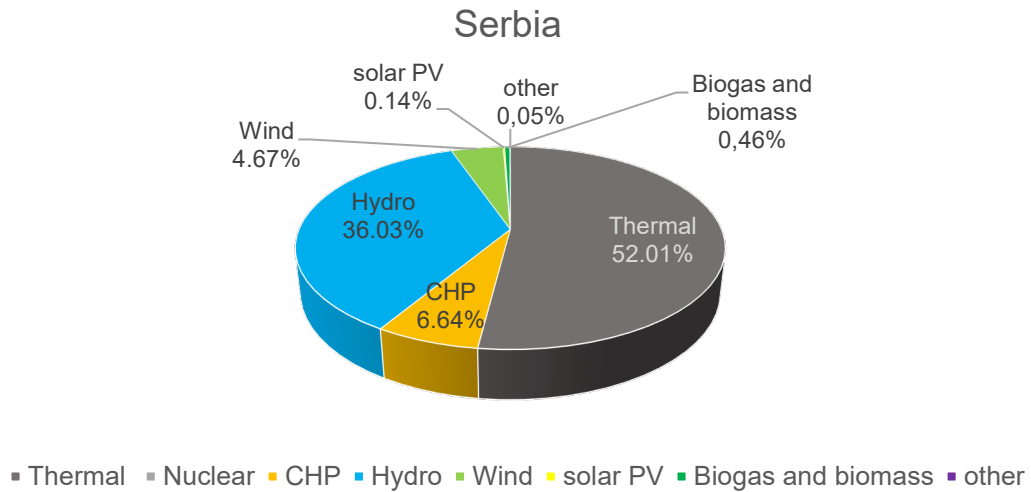
a)

### North Macedonia

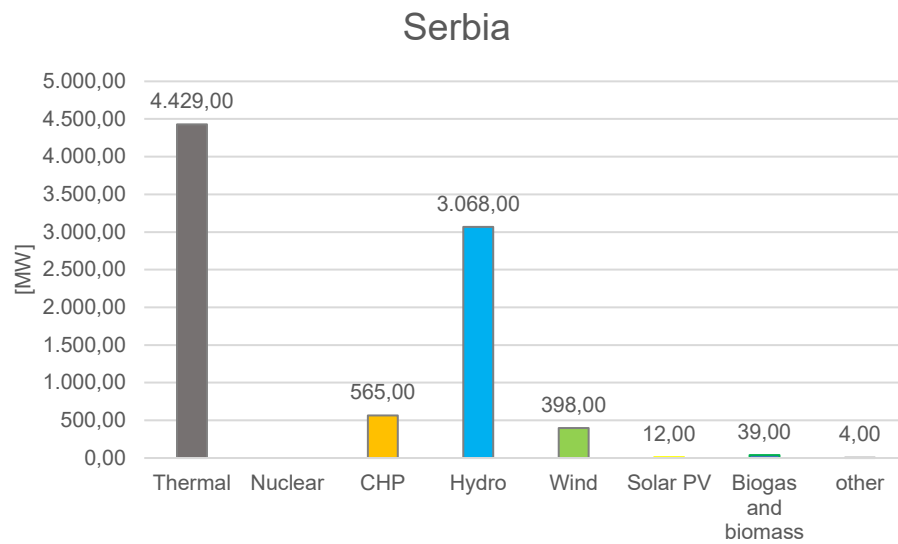


b)

Figure 6 Generation mix of North Macedonia at the end of 2021: a) share of each generation technology, b) installed capacities in MW by each generation technology

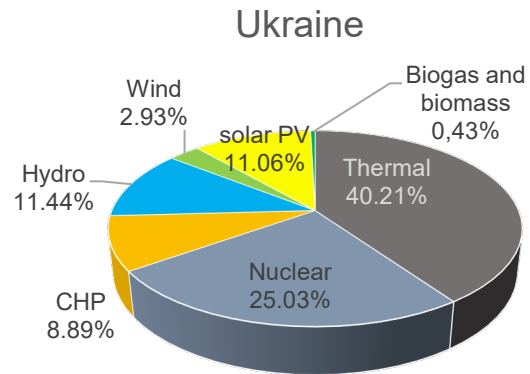


a)



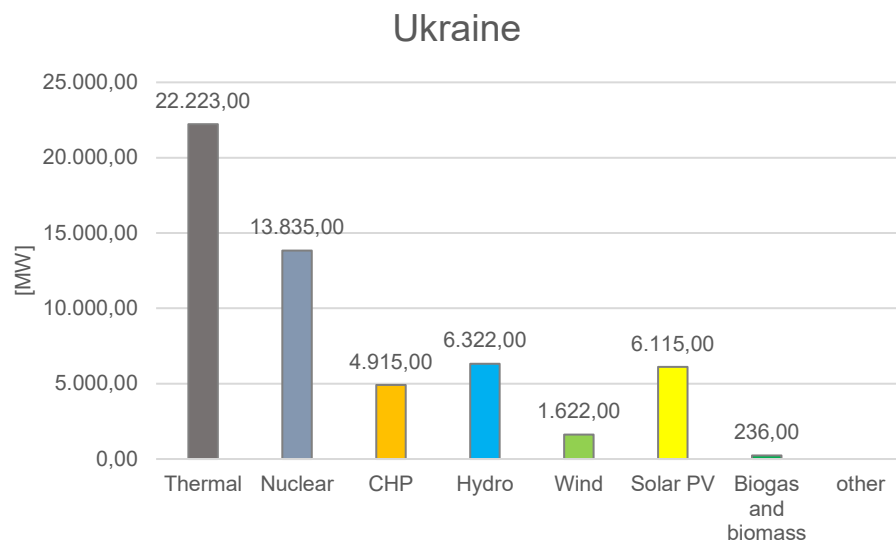
b)

Figure 7 Generation mix of Serbia at the end of 2021: a) share of each generation technology, b) installed capacities in MW by each generation technology



■ Thermal ■ Nuclear ■ CHP ■ Hydro ■ Wind ■ solar PV ■ Biogas and biomass ■ other

a)



b)

Figure 8 Generation mix of Ukraine at the end of 2021: a) share of each generation technology, b) installed capacities in MW by each generation technology

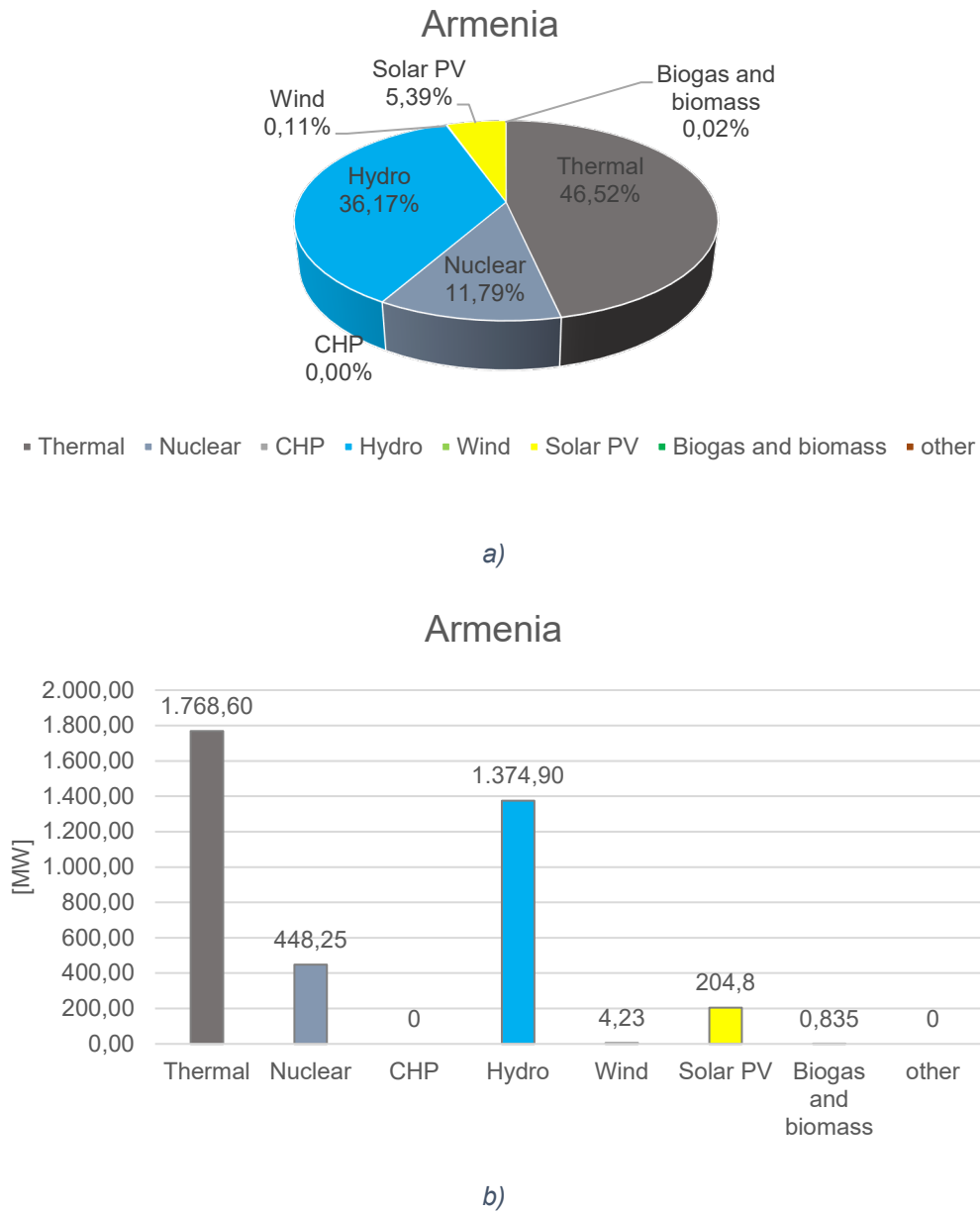
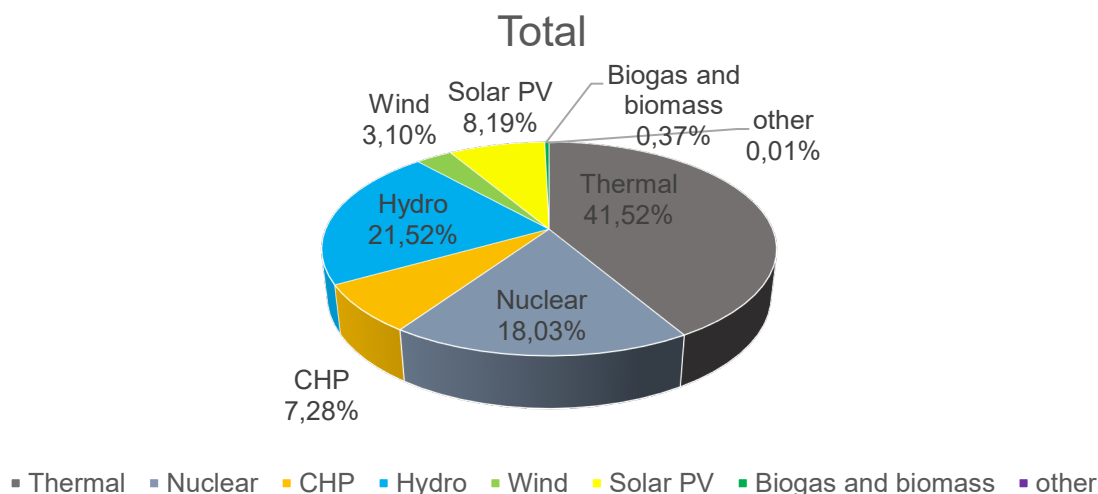
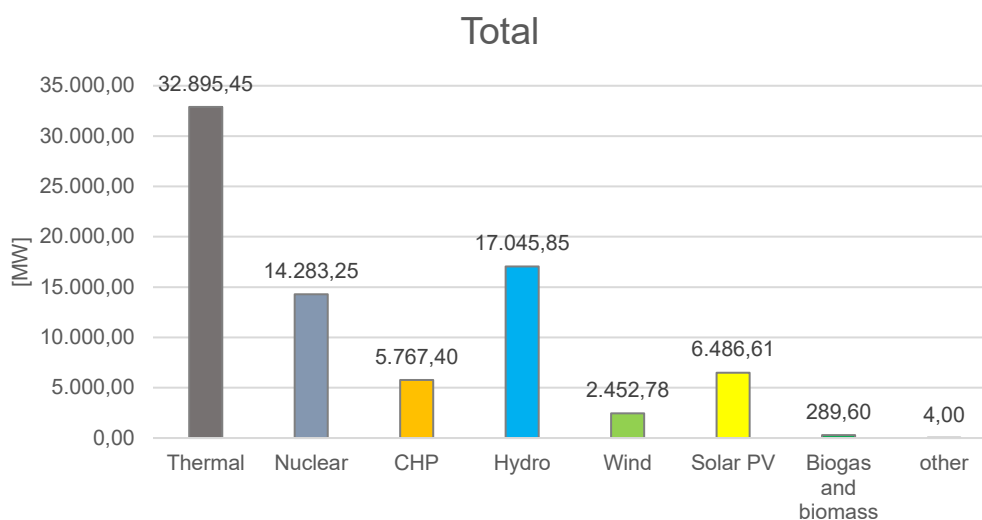


Figure 9 Generation mix of Armenia as of 5<sup>th</sup> of December 2022: a) share of each generation technology, b) installed capacities in MW by each generation technology



a)



b)

Figure 10 Total generation mix of all previously presented Contracting Parties and Armenia: a) share of each generation technology, b) installed capacities in MW by each generation technology

## 2. Transposition of EU legislation related to renewable energy sources

On 30<sup>th</sup> of November 2021, the EnC *acquis communautaire* was amended to include *Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources* by the Ministerial Council Decision 2021/14/MC-EnC. In this regard, each EnC Contracting Party is obliged to bring into force the laws, regulations and administrative provisions necessary to comply with this regulation.

Based on the answers given, the Directive (EU) 2018/2001 was transposed only in two EnC Contracting Parties - Bosnia and Herzegovina, in particular in the BIH entity Republika Srpska, and Serbia, while in Georgia it has been partially transposed so far. In Bosnia and Herzegovina's

entity Republika Srpska, RED II has been transposed in the primary legislation but for the rest of this country, transposition is still on hold. In Serbia, Directive (EU) 2018/2001 has been transposed in general. Transposition hasn't been finished yet in Albania, Montenegro, North Macedonia, Kosovo\* and Ukraine.

On the other hand, according to *Comprehensive and Enhanced Partnership Agreement (CEPA)* signed between the EU and the Republic of Armenia that entered into force on 1<sup>st</sup> of March 2021, the Republic of Armenia committed to gradually adapt its legislation to *Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources (RED I)* (6 years from the entry into force of CEPA).

### 3. The support schemes applied in Contracting Parties

The most commonly applied RES support scheme in Contracting Parties is the combination of feed-in tariffs and market premiums. However, several Contracting Parties have also introduced other mechanisms of RES support.

In **Albania**, both feed-in tariffs and market premiums are introduced, based on methodologies for each technology approved by the Council of Ministers. The market premium (with maximum and minimum ceiling price) applies to the existing priority producers from HPPs up to 15 MW. On the other hand, the feed-in tariffs are applied to solar photovoltaics (PV) with an installed capacity of up to 2 MW and WPPs up to 3 MW, while the solar PV above 2 MW and WPP above 3 MW that have been selected through an auction process conclude the Contracts for Difference (CfD). Currently, the electricity produced by the RES is purchased by the Free Market Supplier (FTL sha) via a long term power purchase agreement.

So far, two auctions for PV power plants were organized. The first one was organized in May 2020 with a winning bid price of 24.89 EUR/MWh, while the second one was organized in March 2021 with a winning bid price of 29.89 EUR/MWh. In both auctions, total offered capacity – 140 MW in the first and 100 MW in the second – was allocated, whereas 70 MW for each project is under CfD, while remaining capacity has to be sold in the liberalized electricity market. The auction price is calculated according to the feed-in tariff price as a maximum ceiling price.

In **Bosnia and Herzegovina's entity Federation of Bosnia and Herzegovina** the feed-in tariff mechanism for the guaranteed purchase of electricity produced from RES can be applied to:

- 1) HPPs with an installed capacity of up to 10 MW,
- 2) WPPs,
- 3) solar power plants (SPPs) with installed capacity of up to and including 1 MW,
- 4) geothermal power plants with an installed capacity of up to and including 10 MW,
- 5) biomass power plants with an installed capacity of up to and including 10 MW,
- 6) biogas power plants with an installed capacity of up to and including 1 MW,
- 7) waste power plants with an installed capacity of up to and including 5 MW.
- 8) an efficient cogeneration plant with an installed capacity of up to and including 5 MWe.

In **Bosnia and Herzegovina's entity Republika Srpska** the new law on renewable energy sources entered into force on 6<sup>th</sup> of March 2022. According to this law, the feed-in tariff mechanism for the guaranteed purchase of electricity produced from RES can be applied to:

- 9) HPPs with an installed capacity of up to 150 kW;
- 10) WPPs with an installed capacity of up to 150 kW;
- 11) SPPs on the ground with installed capacity up to/including 150 kW;
- 12) SPPs on buildings:
  1. installed capacity up to 50 kW,
  2. installed capacity above 50 kW, including 500 kW;
- 13) biomass and biogas power plants, landfill gas and gas from the municipal wastewater treatment plant:
  1. installed capacity up to 50 kW,
  2. installed capacity above 50 kW, including 500 kW.

The calculation method of the guaranteed purchase price is based on technical and economic parameters (e.g., investment value, power plant power, power plant operating hours, operating and maintenance costs, and cost of capital). One of the eligibility preconditions for feed-in tariff support is to have only new equipment installed in the generation facility. RES Operator (off-taker) purchases the electricity generated by the RES producers entitled to a feed-in tariff support scheme. In line with the *Action Plan for the share of consumption from the RES and high efficiency cogeneration*, the Government sets capacity quota limiting the feed-in tariff support. When a feed-in quota is filled, the RES producer that participates in the market or a self-consumer can apply for market premium, but this type of support also has a quota limitation. If all the prescribed conditions are met, after submitting a request to the Regulatory Authority, owners of production facilities from RES or high efficiency cogeneration are entitled to incentives in accordance with the Action Plan for incentives (feed-in tariff or feed-in premium) determined by the competent institutions (Government).

In **Georgia**, two types of support schemes are currently applied: feed-in premium and power purchase agreements (PPAs) and support measures based on the *Law on Public Private Partnership*.

The feed-in premium scheme applies to the electricity producers from RES with an installed capacity of more than 5 MW, during the period of 10 years since the start of operation of the concerned producer. The feed-in premium of 1.5 US cents/kWh is added to the hourly market price, but the total price (sum of feed-in premium and market price) is limited to 5.5 US cents/kWh. On the other hand, the second type of support scheme is broader in scope and it can be allocated both via auction or direct negotiation.

In **Kosovo\***, the application of the feed-in tariffs to support the construction of new generation capacities from RES was terminated in 2020 (however, it still applies only to the RES producers awarded a construction authorization before the end of 2020). The Decision to terminate the feed-in tariff support scheme was based on a conclusion that supporting investments in renewable energy through feed-in tariffs is no longer necessary compared to several years ago, taking into



account developments in many countries in Europe, and that investment costs and prices set by the market itself, through competitive means or auctions would create equal investment opportunities for all potential investors and ensure the development of the RES sector.<sup>7</sup>

However, RES generating facilities not entitled to the feed-in support can choose to sell generated electricity to the Market Operator under the Regulated Framework, at the reference price set annually by ERO (NRA). The regulated framework also includes priority in dispatch, exclusion from the balancing responsibility for units under 500 kW and priority in processing the connection request. The sale of electricity to the Market Operator is covered by a Power Purchase Agreement between concerning producer and the Market Operator for a period of a minimum one year. The maximum duration of the PPA equals the validity period of the RES Generation License issued by the ERO. If the RES Operator is not required to obtain a Generation License, the duration of the PPA is limited to fifteen years.

There is still no case of application of auctions for RES in Kosovo\*. However, the auction scheme is expected to be developed in course of 2022.

In **Montenegro** the support scheme is still based on the feed-in tariff model solely, however, an introduction of the market premiums is expected in near future. The electricity producers awarded with feed-in tariff, so-called “privileged producers”, sell generated electricity at guaranteed purchase prices to the Market Operator, have priority in dispatch, are not financially responsible for the imbalances they cause, etc. Based on the long term PPA with a privileged producer, the Market Operator purchases all energy generated by privileged producers and calculates and resells it to suppliers and self-suppliers depending on their share in consumption. The Government of Montenegro sets the guaranteed purchase price administratively for the qualified RES and HEC (high-efficiency cogeneration) producers. In the case of HPPs with installed capacity greater than 1 MW, the tenders are organized for granting the right to use state-owned land for constructing an HPP.

In accordance with the provisions of the *Energy Law of Montenegro*, on 29<sup>th</sup> of July 2021, the Government of Montenegro issued a Decision to terminate the feed-in support scheme for new producers from RES and HEC since the national target for the use of RES has been achieved. However, activities on drafting a separate law dealing with RES have just started, with the completion deadline till the end of 2022. It is foreseen that the RES Law will introduce market premiums auctions for future eligible RES producers. Auctions are expected to be organized in 2023.

The Energy Law of **North Macedonia** prescribes two types of support schemes for RES: feed-in tariffs (applicable since 2007) and market premiums (applicable since 2018). However, current support is mainly based on feed-in tariffs. The ERC (NRA) grants the preferential status to the preferential producer upon individual request in accordance with the Rulebook for preferential producers that use feed-in tariffs. When issuing the preferential producer status, ERC checks if the producer meets the terms and conditions of the *Decree on the measures supporting the electricity generation from renewable energy sources* and the *Decision on the total installed*

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<sup>7</sup> [https://www.ero-ks.org/zrre/sites/default/files/Publikimet/Vendimet/V\\_1321\\_2020\\_Decision%20on%20termination%20of%20the%20aapplication%20of%20Feed-in%20Tariff%20for%20RES.pdf](https://www.ero-ks.org/zrre/sites/default/files/Publikimet/Vendimet/V_1321_2020_Decision%20on%20termination%20of%20the%20aapplication%20of%20Feed-in%20Tariff%20for%20RES.pdf)

*capacity of preferential electricity producers*, both adopted by the Government of the Republic of North Macedonia. The Government sets the guaranteed purchase price of electricity produced by the preferential producers that applies in a period of 15 to 20 years, depending on the type of the power plant. The Electricity Market Operator is obliged to purchase the generated electricity by preferential producers at the guaranteed price, based on the Power Purchase Agreement. The Electricity Market Operator sells the electricity to every supplier/trader who supplies the end consumers.

In 2018, market premiums were introduced for PV SPPs only (it is expected that soon market premiums will start to apply to WPPs too). The preferential producers entitled to market premium have to sell the electricity on the wholesale market. However, if they cannot sell the electricity on the wholesale electricity market, there is an offtaker<sup>8</sup> that guarantees the purchase of the produced electricity, in case of which they conclude a PPA for one year. The preferential producer eligible for a premium tariff is chosen via tender procedure with the auction, carried out by the Ministry of Economy. The premium is granted to a preferential producer as an additional fixed amount to the price realized by the sale of each produced kWh on the wholesale electricity market over a period of fifteen years. The tender procedure for awarding premiums is conducted as an open procedure with an auction in accordance with the provisions of the Decree on the measures to support electricity generation from renewable energy sources and the Law on Public Procurement. The criterion for selecting the most favorable bid is the lowest offered fixed premium. The auction, conducted as a repetitive electronic process after the initial full evaluation of the bids, shall take place if it has been determined that there are at least two acceptable bids, whereas the ranking of bids is done by using automatic evaluation methods. The lowest of all eligible bids is set as the initial amount of the fixed premium at the auction. For a successfully conducted auction, it is necessary to have at least one gradual reversed bidding below the initial amount.

The subject of the tender is divided into lots:

- Lot 1: 200 - 500 kW, where the total installed capacity of all power plants for which bids have been submitted cannot be higher than 3 MW;
- Lot 2: 501 - 1000 kW, where the total installed capacity of all power plants for which bids have been submitted cannot be higher than 22 MW;
- Lot 3: 1001 - 6000 kW, where the total installed capacity of all power plants for which bids have been submitted cannot be higher than 25 MW and
- Lot 4: 6001 - 10000 kW, where the total installed capacity of all power plants for which bids have been submitted cannot be higher than 30 MW.<sup>9</sup>

Upon conducting the e-auction the commission shall determine the awarded capacities depending on the lowest premium offered for the requested capacity in the respective lot, in which case the bidder that has offered the lowest premium is entitled to the market premium. Then, the right to use a premium is granted to the bidder that has offered the next lowest bid for the installed

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<sup>8</sup> Trader or supplier selected by the Ministry of Economy in a previously conducted tendering procedure with a public call to which the provisions from the Public Procurement Law shall apply accordingly.

<sup>9</sup> These lots were relevant for the last public call (80 MW).

capacity of the power plant. This rule is repeated until the determined quota for the respective lot is fulfilled. To the bidders who will not participate in the electronic auction, the requested capacity written in their bid shall not be granted. After the e-auction, the bidders whose bid was selected as the most favorable sign a contract with the Ministry of Economy. These contracts are valid for a period of three years during which the investors shall put the PV plant into operation. After 3 years, contracts for using market premium shall be concluded between the Ministry of Economy and the investors, after which the Ministry disburses the premium to the investors upon receiving an invoice on monthly basis, for a period of 15 years.

The Government of the Republic of North Macedonia adopted a *Decision on the total installed capacity of the preferential electricity producers*, according to which the total installed capacity of the photovoltaic power plants for which market premiums awarded is 200 MW. So far, the Ministry of Economy has announced three public calls for awarding contracts for the right to use the market premium for electricity produced by photovoltaic power plants, one on state land and two on private land. The first two announcements were published in 2019 for a total installed capacity of 60 MW, and the third in 2021 for a total installed capacity of 80 MW. The total amount of capacity from all three public calls was allocated (35 MW + 25 MW + 80 MW). There are still 60 MW for which the procedure for the right to award a premium has to be conducted. In line with the *Program for financial support to produce electricity from preferential producers using premium for 2021*, the maximum reference amount of the fixed premium for the PV SPPs was set to 15 EUR/MWh.

In **Serbia** the support scheme for RES includes feed-in tariffs and market premiums, as well as an assumption of balance responsibility, priority access to the system during the predefined incentive period and obligation to simplify connection procedures for RES facilities. Exceptionally, producers of electricity from RES that are outside the support scheme have the right to assume balancing responsibility, the right to priority access to the system and the right to issue guarantees of origin for electricity in accordance with the Law on the use of renewable energy sources from 2021 (RES Law from 2021).

Feed-in tariffs can be granted to power plants that use RES with installed capacity up to 500 kW (except WPPs where the capacity limit is 3 MW), while for capacities above 500 kW (or 3 MW for WPP), a market premium can be granted. All the electricity produced by RES under the feed-in tariffs is purchased by the Guaranteed supplier, while the producers awarded a market premium participate directly in the market and receive support separately. Feed-in-tariffs and market premiums are assigned to the renewable producers at auctions. No auction for the market premium or feed-in tariffs has been performed yet.

**Ukraine** developed its own model for stimulating the production of electricity from RES. The 'green' tariff defined by the *Alternative Energy Sources Law of Ukraine*, which is similar to the feed-in tariff, applies to economic entities and energy cooperatives whose RES installed capacity does not exceed 150 kW, and private households whose RES installed capacity does not exceed 50 kW. Article 9<sup>1</sup> of above-mentioned law prescribes the coefficients of the 'green' tariff, which are differentiated depending on the category of the production facility and the dates of commissioning of the electricity facilities or their queues/ start-up complexes. The 'green' tariff for business entities that produce electricity using alternative energy sources is set at the level of the retail tariff for consumers of the second voltage class as of January 2009, namely 58.46

kopecks/kWh without VAT (*Decision of the National Electricity Regulatory Commission of Ukraine*, No. 1440), multiplied by the coefficient of the 'green' tariff. The fixed minimum size of the "green" tariff for business entities and private households is established by converting the "green" tariff into euros, calculated according to the rules of the Law, as of 1<sup>st</sup> of January 2009, at the official exchange rate of the National Bank of Ukraine on that date, which was 1085, 5460 hryvnias for 100 euros.

The "green" tariff for electric power facilities put into operation by 31<sup>st</sup> of December 2024, and private households and consumers, including energy cooperatives, with whom an agreement on the purchase and sale of electricity was concluded by 31<sup>st</sup> of December 2024, cannot be less than the fixed minimum level of the 'green' tariff, which on the date of the last meeting of the National Commission in each quarter is converted into national currency at the average official exchange rate of the National Bank of Ukraine for the last 30 calendar days preceding the date such a meeting. Taking into account the above, the level of the 'green' tariff directly depends on the date of commissioning of the power plant and the type of energy source used in the production of electricity, and is set in euros until the 1<sup>st</sup> of January 2030 and is recalculated quarterly. In addition, a business entity wanting to apply the mechanism for stimulating the production of electricity from RES must meet the requirements specified in the *Procedure for establishing, revising and terminating the effect of the "green" tariff for electricity for business entities, consumers of electricity, including energy cooperatives, and private households, whose generating units produce electricity from alternative energy sources*, approved by the resolution of the NEURC (NRA), and submit the application and the documents, the exhaustive list of which is determined by the order, to the NEURC. The further procedure is carried out in accordance with the regulations of the NEURC. The decision to establish a "green" tariff for an economic entity, including the queue of an electric station, a start-up complex, is made at an open meeting of the NEURC, which is held in the form of an open hearing.

There have been no auctions for obtaining a "green tariff" in Ukraine yet, but the procedure for conducting them exists and is determined by the *Resolution on the introduction of competitive conditions for stimulating the production of electricity from alternative energy sources* of the Cabinet of Ministers of Ukraine.

Another type of support scheme for RES is based on auction price results. Auctions are organized upon the proposals of the State Energy Efficiency Agency and Transmission system operator regarding the size of the annual support quota (with distribution by individual types of alternative energy sources by the State Energy Efficiency Agency) for the following year and indicative forecast indicators of the annual support quotas for the four years following the year for which the annual support quota is established.

In addition, there is a surcharge to 'green' tariff or auction price for compliance with the level of use of Ukrainian-made equipment defined by Article 9<sup>2</sup> of the *Alternative Energy Sources Law of Ukraine* and the *Procedure for determining the level of use of Ukrainian-made equipment* at power engineering facilities, including those put into operation in phases of construction of electric power stations (start-up complexes) that produce electricity from alternative energy sources (except blast furnace and coke gases) and using hydropower (only micro, mini and small HPP).

In **Armenia**, a feed-in tariff support scheme is applied. Small HHPs with the installed capacity of up to 30 MW and other electricity producers from RES, whose electricity purchase guarantee has not expired according to Energy Law, sell electricity to the Universal (Guaranteed) Supplier at fixed tariffs. These tariffs are calculated and revised in line with the methodology approved by the Public Services Regulatory Commission's (PSRC) Resolution №88-N of 22<sup>nd</sup> of April 2015. By 1<sup>st</sup> of June every year, PSCR carries out the tariff revision taking into account the exchange rate of the Armenian dram against the US dollar and the inflation rate, which enters into force from 1<sup>st</sup> of July of the concerning year. However, the above-mentioned methodology does not apply in case the electricity generation license is obtained under the framework of State-Private Partnership transactions, but tariffs are defined through the tender procedures organized by the government-authorized body. In this case, the tariff setting and its revising procedure are prescribed in the State-Private Partnership transaction.

On the other hand, small HHPs with the installed capacity of up to 30 MW of the installed capacity and other electricity producers from RES, whose electricity purchase guarantee has expired according to Energy Law, can sell the electricity in the day ahead market through market management software.

### 3.1. High Efficiency Cogeneration treatment

In most Contracting Parties, the HEC is entitled to a support scheme that is similar to the one that applies to RES. However, some Contracting Parties have not defined specialized HEC treatment in national legislation.

The national legislation of **Albania** does not prescribe the treatment of HEC.

In **Bosnia and Herzegovina**, high-efficiency cogeneration (HEC) has the same treatment as RES when it comes to the support scheme. In that regard, HEC, as well as RES, can be entitled to the following:

- benefits when connecting to the network;
- priority in network access (dispatching);
- mandatory purchase of electricity;
- guaranteed purchase price ("feed-in" tariff) or a premium for the self-consumers or market sales.

According to the specific rules, electricity producers from RES and HEC can exercise one or several above-mentioned incentives.

In **Kosovo\***, the support scheme in force does apply to high-efficiency cogeneration. However, Article 8 of the Electricity Law describes conditions for the construction of the RES and cogeneration, as well as the compensation method for electricity generated from these technologies.

The **Energy Law of Montenegro** defines HEC as the combined and simultaneous process of heat and electricity production where at least 10% savings of primary energy has to be made compared to the separate processes. The Energy Law prescribed that eligible HEC could gain privileged producer status, i.e., to have the same treatment as the RES privileged producer's group

(guaranteed prices, excluded balance responsibility, guarantees of origin, etc.). Nevertheless, there is no installed capacity in HEC in Montenegro so far.

In **North Macedonia**, the *Energy Efficiency Law* defines the "high-efficiency combined plant" or "HECP" as a plant that produces electricity and thermal energy with a high efficiency coefficient of the plant and fulfils the requirements prescribed in Article 25 of above-mentioned law and in the *Regulation on CHP and guarantees for electricity energy produced from HECP*. The Law further stipulates that persons who submit requests for issuance of authorization for the construction of new facilities or expansion of existing facilities to produce electricity and/ or thermal energy are obliged to conduct a preliminary cost-benefit analysis and submit it to the Government, as part of the necessary documentation for issuing an authorization, for power plants in the following cases:

- during the construction of a new energy facility for electricity production (TPP) with a total heat input capacity of the plant greater than 20MW, to assess the costs and benefits of operating the installation as a highly efficient combined plant,
- during a substantial renovation of an existing energy facility for the production of electricity (TPP) with total heat input capacity in a plant greater than 20MW to estimate the costs and benefits of converting to highly efficient combined plant.

The Energy Law prescribes that the electricity TSO and DSO shall be obliged, in an objective, transparent and non-discriminatory manner, to ensure priority of access to the systems and priority in the dispatching of highly efficient combined plants in a manner and under conditions determined in the network rules, considering the limitations arising from the operational possibilities of the power system. However, the support schemes have not been applied yet.

In **Serbia**, the *Energy Efficiency and Rational Use of Energy Law* prescribes non-financial and financial incentives for the electricity market participants who use energy efficient technologies, including electricity producers from highly efficient cogeneration. Non-financial incentives include:

- the guarantees of origin for electricity;
- the connection to the electric power distribution or closed distribution system and to the system for the distribution of thermal energy in a simplified procedure;
- the priority access to the electric power transmission, distribution, or closed distribution system, as well as the system for the distribution of thermal energy, except in the case when the operational security of energy systems or the security of supply is threatened;
- regulation of balance responsibility according to the rules of *Energy Efficiency and Rational Use of Energy, Energy Law* and the contract on market premium;
- the right to access any electricity market, taking into account the technical capabilities and limitations of market participants, in accordance with the law governing the field of energy.

On the other hand, financial incentives are enabled through the system of market premiums. According to the above-mentioned Law, electricity producers in highly efficient cogeneration with an installed capacity of 500 kWe to 10 MWe have the right to financial incentives through the system of market premiums. So far, the installed capacity for electricity production in HEC is 35,9 MW.

The issue of cogeneration in **Ukraine** is regulated by the *Law of Ukraine on the combined production of thermal and electric energy (cogeneration) and the use of waste energy potential*, as well as by the *Order of the Ministry of Energy of Ukraine on approval of the Procedure for the qualification of cogeneration installation*, which prescribe the procedure for conducting the qualification of a cogeneration installation. Pursuant to the *Tax Code of Ukraine*, operations on the sale of electricity produced by qualified cogeneration plants and/or from renewable energy sources are exempt from excise tax (3.2%).

However, high-efficiency cogeneration has not been introduced in national legislation yet. Aiming to harmonize the provisions of the current legislation of Ukraine with the principles and provisions of the legislation of the European Union in the field of the development of high efficiency cogeneration, namely Directive 2004/8/EU and Directive 2012/27/EU, the amendment of the *Law of Ukraine on Combined Production of Thermal and Electric Energy (Cogeneration) and Use of Waste Energy Potential* has been prepared. The Draft law from 21.12.2020 No. 4527 is under consideration in the Parliament.

In **Armenia**, neither the definition of high-efficiency cogeneration nor any support scheme for HEC has been introduced in national legislation yet. However, according to CEPA, the Republic of Armenia committed to gradually adapt its legislation to *Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency* within the stipulated timeframes (4 years from the entry into force of CEPA).

### 3.2. Self-consumption scheme

In **Albania**, a self-consumer can install generating capacities up to 500 kW pursuant to the Law on RES. For billing of self-consumers, net-metering scheme is in place based on the Law of RES. Additionally, the Minister of Infrastructure and Energy has approved the Guideline No. 3/2019 “*On the approval of the simplified authorization procedure for the connection in the distribution system of small projects renewable for self-producers of electricity from PVs*”.

In **Bosnia and Herzegovina’s entity Republika Srpska**, a premium support scheme is introduced for the self-consumers too. This scheme applies to all supported types of RES and high efficiency cogeneration. There is no limitation regarding the group of consumers.

On the other hand, the self-consumption scheme has not yet been introduced in **Bosnia and Herzegovina’s entity Federation of Bosnia and Herzegovina**. However, the introduction of net billing and net metering schemes is expected soon since the proposals of three sets of laws in the field of the energy sector were adopted by the Government of the Federation of Bosnia and Herzegovina and referred to the further parliamentary procedure.

Self-consumption schemes in **Kosovo\*** are introduced in the *Rule on authorization procedure for the construction of new generation capacities from renewable energy sources*. According to this rule, only consumers connected to low voltage (0.4 kV) are entitled to a self-consumption support scheme. The limit of generating capacities of self-consumer is set to 100 kW.

ERO issues the decision related to the construction of new generation capacities for self-consumers upon the submitted request by the legal entity or natural persons. Pursuant to the *Rule*

on authorization procedure for the construction of new generation capacities from renewable energy sources, the following documents should be submitted to ERO:

- evidence from DSO (KEDS) on annual energy consumption;
- evaluation of annual kWh production of installed equipment;
- consent for connection to the grid, issued by DSO; and
- consent from the relevant municipality.

Currently, there are no additional charges for the energy injected into the network. For billing purposes, net-metering model is applied, while the equipment for energy production from self-consumers is exempted from VAT.

As of 29<sup>th</sup> of July 2022, there are 154 projects with 5.64 MW authorized capacity of self-consumption.

In the Energy law of **Montenegro**, the self-consumer is defined as the end-consumer who produces electricity from RES or HEC for self-consumption and occasionally delivers the surplus of electricity produced into the distribution system, in production equipment with installed capacity up to the approved consumer's connection capacity. The self-consumer can consume, store and sell the surplus of electricity, individually or by aggregation. Pursuant to this Law, net-metering is applied for self-consumers and the supplier is obliged to purchase a surplus of electricity at price defined in the contract for the supply, i.e., at the same price at which the consumer buys electricity from the supplier.

To support self-consumption deployment, Elektroprivreda Crne Gore AD Nikšić (EPCG - dominant supplier in Montenegro) in cooperation with Eko Fond has introduced the project 'Solari 3000+' and 'Solari 500+' for financing and subsidizing users for the purchase and installation of PV systems with an installed capacity up to 10 kW for individual residential buildings, or for photovoltaic systems with an installed capacity of up to 30 kW for legal and natural persons.

In 2021, the total installed generating capacity of self-consumers was 0.6 MW.

In **North Macedonia**, self-consumption schemes are introduced in the national legislation. They apply to households, a community of households - owners of separate parts in a residential building who have concluded an agreement for performing management services with a manager of a residential building for the use of the common parts in the residential building, small consumers and budgetary users. The limits for generating capacities of self-consumption are defined in the *Rulebook for renewable energy sources* adopted by the Minister of Economy. For households, the limit is 6 kW of installed capacity, and for other consumer, the limit is 40 kW of installed capacity.

The Government adopted the *Program for Promotion of RES in households for 2022* to support self-consumption. By launching this Program, the Government allocated 30,000,000 MKD or approximately 488,000 EUR for reimbursement of a portion of the costs for purchasing and installation of PV for electricity generation for self-consumption of the households up to 30% of the costs but not more than 62,000 MKD or around 1000 Euros.

The procedure is based on public call and the 'first come first served' principle until the predefined budget of the program is allocated.



In 2021, the total installed capacity of self-consumers was 0.77 MW.

In **Serbia**, net metering is applied to households and small enterprises (small customers), while net billing is used for all other groups of consumers. Regarding the capacity limitations, according to the RES Law from 2021, the maximum generating capacity for self-consumers is equal to their capacity for consumption.

Pursuant to the RES Law from 2021, there are two non-financial incentives for prosumers:

- the priority network access and dispatch by the transmission system operator, the distribution system operator, or the closed distribution system operator, except in the case when the operational security of the system is threatened, and
- simplified connection procedure for the power plant of a prosumer, with an installed capacity of 10.8 kW or less, or an equivalent connection capacity that it is not three-phase.

In 2021 and 2022, the Ministry of Mining and Energy announced a public call for the allocation of funds for the financing of solar PV panels for households. The subsidy can be obtained for the purchase of solar panels with an installed capacity that is not higher than the approved capacity for consumption, but not more than 6 kW. The subsidy also includes the purchase of equipment, installation services and preparation of the necessary technical documentation.

Households are selected based on four criteria (condition of the external walls, the heating method, the characteristics of the external carpentry and the K factor of the area occupied for the building). Preference is given to households with insulation, which are heated with wood, natural gas, pellets, the city heating plant, and which have PVC or aluminum windows.

The maximum amount of funds is 420,000.00 RSD (3600 EUR) including VAT, or the amount obtained by multiplying the installed PV capacity in kW by the amount of 70,000 RSD (600 EUR). For PV panels with an installed capacity greater than 6 kW, households pay the difference to the total value of the works.

The total installed generation capacity of self-consumers for households is 586,415 kW, and for others (other than households or residential communities) is 1,621.88 kW.

In **Ukraine**, household consumers who have installed RES generating units have the right to sell the produced electricity at the "green" tariff to the universal service provider. Other consumers, including energy undertakings, sell the produced electricity at a "green" tariff to a guaranteed buyer. The provider of universal services buys a surplus of generated electricity from a household consumer (difference between monthly consumption and generation of that household), if positive, at the "green" tariff established by the NEURC. If the monthly electricity consumption of a private household exceeds the amount of electricity produced by the generating unit(s) of such private household, the household consumer must pay the difference between the electricity consumed during the month (settlement period) and the electricity injected into the grid at the tariff specified in the contract for the electricity supply.

The capacity limit for private households is 50 kW, while for other consumers, including energy undertakings, the limit is 150 kW.

As of 1<sup>st</sup> of January 2022, the total installed capacity of generating units of private households is 1,203 MW.

The mechanism of "production for own consumption on the basis of net billing" is in the development phase. NEURC actively participated in the development of the specified mechanism, which will be applied to private households and small non-domestic consumers, including energy undertakings.

In **Armenia**, pursuant to the Energy law, the installed capacity of the autonomous producer (self-consumer) cannot exceed the maximum capacity approved in the contract concluded as a consumer for each of its connection points to the distribution network, but not more than 150 kW. In the case of an autonomous group, the total installed capacity of the installations of the autonomous energy producers involved in the group cannot exceed 1,050 kW.

According to *Strategic Development Plan of Republic of Armenia* in energy field (until 2040), the construction of autonomous power plants with total installed capacity up to 300 MW is envisaged until the December of 2024. By the date of 1<sup>st</sup> of November 2022 the total installed capacity of autonomous energy producers is 188 MW.

### 3.3. The support scheme financing

In most cases, the funds for supporting RES integration are collected from the final consumers via electricity bill, either by transparently presenting the share of RES cost separately on the bill or by incorporating it into the retail tariff. However, in some Contracting Parties, part of the funds are covered by other means.

In **Albania**, as the Renewable Energy Operator (REO) is not yet in place, generated electricity from HPP, PV SPPs with a capacity of up to 2 MW (awarded by construction permission in 2017 and 2018) and Ashta Power Plant is purchased by the *Supplier of the Free Market* which is obliged to sell it to the distribution system operator (DSO) at the same price, so it would be used to cover the distribution losses. The draft methodology for calculating payment for RES support is submitted to NRA for approval and is currently in the approval process.

There is no direct impact of the RES support scheme in the retail tariffs from RES because the Universal Service Supplier ('USS') has a contract with KESH sh.a. in accordance with the provision of the Decision 244/2016 on public service obligation and from the free market. In 2021 the government with Decision no.584/2021 declared the state of emergency on the supply of energy and after with Decision no.620/2021 amended the public service obligation on the licensed power sector in the state of emergency on supply of energy, where KESH sh.a. cover all the demand of the USS in accordance with the price determined by the Decision of the general assembly of KESH sh.a.

The funds for stimulating the production of electricity from renewable sources and efficient cogeneration are covered by charging the fee for supporting the production from RES to all end electricity customers in the **Bosnia and Herzegovina's entity Federation of Bosnia and Herzegovina**. Pursuant to the *Law on Renewable Energy Sources and Efficient Cogeneration*, all end electricity customers in the Federation are obliged to pay this fee. The supplier is obliged to indicate the level of fee per kWh and the total amount of the incentive fee on monthly basis in the bill. After charging consumers, the supplier is obliged to transfer the funds collected for RES support to the account of the Operator for Renewable Energy Sources and Efficient Cogeneration.

The amount of the fee required for the RES support and the fee per kWh for each subsequent year is determined by the Government of the Federation of Bosnia and Herzegovina upon the proposal of the Federal Ministry of Energy, Mining and Industry.

The funds collected from the RES fee represent the Operator's revenue for Renewable Energy Sources and Efficient Cogeneration, which are then used for:

- purchase of the electricity produced by privileged producers at a guaranteed purchase price,
- financing the operating costs of the RES operator,
- covering of balancing costs of the RES Balance Group in the Federation of Bosnia and Herzegovina.

In **Bosnia and Herzegovina's entity Republika Srpska**, all consumers are charged the fee for supporting the RES integration. The funds are fully covered by the consumers through electricity bills, i.e., they are not supported by the state budget. In 2020 the overall funds of RES support scheme collected via consumers' tariffs were 6.884.777 EUR for energy and 9.917.148 EUR for the premium, in total it is 16.801.925 EUR, while in 2021 the overall costs were 17.023.527 EUR (7.198.821 EUR for the energy and 9.824.706 EUR for the premium). The impact of those fees on the retail tariff was in the range of 4-8%.

In **Georgia**, currently, the costs for supporting the RES deployment are integrated into the retail tariff that is collected from all consumers. In the forthcoming period, it is planned to make the bills more transparent for consumers by defining the renewable surcharge separately.

In **Kosovo\***, the costs of the RES support are compensated through the Renewable Energy Fund, managed by the Market Operator. The Renewable Energy Charge is applicable at the transmission level to all suppliers of electricity in Kosovo\*. The total cost of RES under the support scheme was 32.8 million EUR in 2021, while they were 31.4 million EUR in 2020. The approximate impact of the RES support charge on the retail tariff was around 5.8% in 2021 (RES fee = 2.011 EUR /MWh) and 6.6% in 2020 (RES fee = 3.802 EUR /MWh).

In **Montenegro**, consumers pay the RES fee for monthly consumption greater than 300 kWh, while the rest of the RES funds are covered via a 'specialized budget' collected from emission-intensive undertakings in Montenegro. The overall costs of RES support included in the consumers' bill were 14.028.937 EUR in 2020, while in 2021 they amounted to 13.547.099 EUR. The share of RES support in households' tariff was 4.41% in 2020 and 4.60% in 2021.

In **North Macedonia**, the suppliers and traders purchase the share of electricity produced by the preferential producers that use feed-in tariffs from the Electricity Market Operator, calculated as the ratio of the electricity needs of their consumers in the total forecasted electricity needs of electricity consumers in North Macedonia on a daily basis. In that regard, they are obliged to include RES fees in the consumers' bills.

On the other side, the premium support costs for the preferential producers entitled to premiums that participate in the electricity market are covered by the state budget. However, if the preferential producer concludes PPA, off-taker purchases the generated electricity from the preferential producers awarded a premium at the price that corresponds to hourly price on HUPX for the hour in which the electricity is produced decreased by the rabat (%). Rabat is set on the

tender for the selection of the off-taker and it is the criteria for selection. After that, off-taker sells the purchased electricity to its own consumers.

The total costs for the feed-in tariff scheme in 2020 and 2021 were 2,553,714,789 MKD (41,523,817.70 EUR) and 2,555,654,984 MKD (41,555,365.59 EUR) respectively, while for the premium scheme the Ministry of Economy paid 69,863 MKD (1,136 EUR) in 2020 and 3,067,327 MKD (49,875.24 EUR) in 2021 (completely covered by the state budget). In that regard, in 2020 the share of the RES support costs in the final retail tariff of the universal supply was 7.3%, while in 2021 it was 7.21%.

Currently, all electricity consumers in **Serbia** are charged with RES support fee (for both feed-in tariff and market premium support scheme) via monthly electricity bills. As of 1<sup>st</sup> of August 2022, final consumers pay an RES support fee of 0.801 RSD/kWh for each kWh consumed on a monthly basis. The total costs of the RES support scheme added to the tariff were 22,986,890 EUR in 2020, while in 2021 the costs amounted to 108,160,313 EUR. In this regard, the shares of RES support fee in total final price (including taxes and fees) in 2020 and 2021 were 0.97% and 4.21%, respectively.

In **Ukraine**, RES support costs are incorporated into the transmission tariff. Pursuant to Article 33 of the *Electricity Market Law of Ukraine*, the 'costs of performing power system operation to ensure the increase of the share of electricity generated from renewable energy sources' represent a part of transmission total costs, and they are the most significant in the structure of tariff and represent more than 60% of the total transmission expenses of the TSO. In 2020 the average electricity transmission tariff was 240.23 UAH/MWh (~7.85 EUR/MWh) (without VAT), including 157.04 UAH/MWh (~5.13 EUR/MWh) (without VAT) of RES support fee. In 2021, the average electricity transmission tariff was 293.93 UAH/MWh (~9.61 EUR/MWh) (without VAT), whereas 202.22 UAH/MWh (~6.61 EUR/MWh) (without VAT) represented the RES support fee. The end price of electricity for non-residential customers in 2021 is influenced by the costs of supporting producers from renewable energy sources that were included in the transmission tariff at the level of 7.7%.

In **Armenia**, the consumers that are supplied by the Universal (Guaranteed) supplier cover the costs of the RES support scheme via electricity tariffs.

#### 4. The role of the Regulatory Authorities in the support scheme

The role of the Regulatory Authorities in the RES support schemes varies from Contracting Party to Contracting Party. There are examples where a certain NRA is responsible for setting the complete support scheme framework (e.g. in Bosnia and Herzegovina, Kosovo\* and Ukraine) but, on the other hand, there are NRAs with a very limited roles in the RES field.

The details concerning the roles of the Regulatory Authorities of Albania, Bosnia and Herzegovina, Kosovo\*, Montenegro, North Macedonia, Serbia and Ukraine are presented in the following paragraphs.

Based on the methodologies approved by the Council of Ministers, **the Energy Regulatory Authority (ERE) of Albania** approves the purchase price of the renewable electricity generated

by the producers awarded a feed-in tariff or a market premium. ERE also sets the purchase price of the surplus of renewable electricity produced by self-consumers.

**The Regulatory Commission for Energy in the Federation of Bosnia and Herzegovina (FERK)** calculates guaranteed purchase prices in accordance with the *Rulebook on methodology for determining guaranteed purchase prices of electricity from plants that use renewable energy sources and efficient cogeneration*. After that, the calculation is submitted to the Federal Ministry of Energy, Mining and Industry, and the final consent to the price calculation is given by the Government of the Federation of Bosnia and Herzegovina at the proposal of the Federal Ministry of Energy, Mining and Industry. On the other hand, in Bosnia and Herzegovina's entity Republika Srpska, the **Regulatory Commission for Energy of Republika Srpska** adopts the methodology and makes a decision on the level of these prices and premiums with the consent of the Government.

**The Energy Regulatory Office of Kosovo\* (ERO)** develops the *Rule on Support Scheme for RES and Authorization Procedure for RES*. ERO sets:

- the principles of supporting RES generating facilities entitled to the support scheme;
- the eligibility criteria for admission to the RES support scheme;
- the application procedure for admission to the RES support scheme;
- the procedure for funding the RES support scheme;
- the principles of supporting RES generating facilities, in accordance with the Regulated Framework;
- the principles of supporting RES self-consumers.

**The Energy and Water Regulatory Agency of Montenegro (REGAGEN)** issues the privileged producer status to eligible producers upon a request but doesn't have any competencies with regards to the support scheme applied to self-consumers nor in setting the guaranteed purchase price. However, REGAGEN approves the rules on the operation of the distribution system that prescribe the connection conditions for distributed generation from RES and self-consumers. Additionally, REGAGEN monitors the implementation of incentive measures by energy entities.

**The Energy and Water Services Regulatory Commission of the Republic of North Macedonia (ERC)** conducts the procedure for granting the temporary status of preferential producer and status of preferential producer and issues decisions for feed-in tariffs. However, ERC does not have any competencies regarding the support scheme for self-consumers and market premiums. ERC also approves the Electricity Distribution Grid Code that prescribes the general provisions and definitions of self-consumers, and the procedures from submitting a request for connection to the grid up to issuing the consent for connection to the grid by the DSO and putting into operation. Additionally, ERC approves the *Pricelist of the services that are provided by DSO* that defines the level of an administrative fee for the connection.

**The Energy Agency of the Republic of Serbia (AERS)** adopts methodologies for determination of market premiums and feed in tariffs (RES & cogeneration) and it also calculates the maximum level of market premiums and feed-in tariffs for auction purposes. However, AERS does not have any competencies in the support schemes for self-consumers.

In accordance with Article 9<sup>1</sup> of the *Alternative Energy Sources Law of Ukraine*, **The National Energy and Utilities Regulatory Commission of Ukraine (NEURC)** establishes a 'green' tariff for electricity produced from alternative energy sources (except for blast furnaces and coke gases) and hydropower (only by micro, mini and small HPPs) at electric power facilities, including at the commissioned phases of the construction of electric stations (start-up complexes), generating units of private households and other consumers (including energy undertakings). NEURC also sets the surcharge to the 'green' tariff and auction price for compliance with the level of use of Ukrainian-made equipment established by the *Alternative Energy Sources Law of Ukraine*. This surcharge is set by the NEURC for each date of recalculation of the fixed minimum size of the 'green' tariff. Compliance of the level of use of Ukrainian-made equipment with the requirements established by the *Alternative Energy Sources Law of Ukraine* is determined by the NEURC, based on the calculation submitted by the business entity and supporting documents.

Pursuant to Article 65 of the *Electricity Market Law of Ukraine*, NEURC has also competencies in approving the level of the cost of the service to ensure the public interest of increasing the share of electricity production from alternative energy sources. The NEURC includes these costs in the structure of the transmission tariff. Additionally, the NEURC approves the standard form of the bilateral contract producer (or self-consumer) that is entitled to a 'green' tariff and guaranteed buyer for purchasing of renewable electricity at the 'green' tariff, and the procedure for the purchase by the guaranteed buyer of electricity produced from alternative energy sources.

In **Armenia**, the Public Services Regulatory Commission (PSRC) approves the methodology for calculating the tariffs for the sale of electric energy delivered from power plants using RES in the territory of the Republic of Armenia. Also, PSRC approves the Retail Electricity Market Trading Rules that regulate the relationship between the autonomous energy producer and the Universal (Guaranteed) Supplier.

## 5. Balance responsibility

Since the Albanian Electricity Balancing Market became operational, all the priority producers are fully responsible for their imbalances as balance responsible parties in **Albania**. Producers become responsible for their imbalances after signing a contract with the Transmission System Operator or by concluding a contract for the transfer of balancing responsibility to another balance responsible party, thus becoming a member of a balancing group.

In accordance with the current Law on Renewable Sources in the **Bosnia and Herzegovina's entity Federation of Bosnia and Herzegovina**, privileged and qualified producers with an installed capacity:

- of up to 150 kW are not required to submit their production plans and do not pay the costs of balancing,
- from 150 kW to 3 MW are required to submit their weekly production plans to the competent network operator and the Operator for Renewable Energy Sources and Efficient Cogeneration operator (OIEiEK) operator,
- of more than 3 MW are obliged to submit a forecast of their own hourly production to the competent network operator and OIEiEK one day in advance.

Privileged and qualified producers with an installed capacity of more than 150 kW pay the costs of balancing to the OIEiEK operator. The OIEiEK operator was obliged to adopt a special rulebook which was to determine the methodology for cost allocation balancing for privileged and qualified producers as well as the share to be paid by the funds from fees collected for incentives. However, the Operator has not adopted the above-mentioned rulebook, so the concept of balancing responsibility has not been precisely defined yet.

On the other side, in **Bosnia and Herzegovina's entity Republika Srpska**, a producer from RES entitled to the mandatory purchase of electricity is a member of the balancing group of renewable energy sources. The RES Operator is responsible for the balancing group of renewable energy sources. An electricity producer awarded a support for electricity production in one or more small plants whose total installed capacity is less than or equal to 150 kW does not report the daily schedule to the RES Operator and does not bear balancing costs, while the one whose total installed power is more than 150 kW has to report the daily schedule to the RES Operator and bears the balancing costs.

The producer of electricity in large plants awarded a market premium is balance responsible and pays the imbalance costs in accordance with the regulations governing this area.

The RES Operator transfers the costs incurred during balancing operations to the members of the balancing group of renewable sources.

Funds to cover the imbalance costs of the balancing group of renewable energy sources are provided by the RES Operator from the following sources:

- collection of imbalance costs of members of the balancing group of renewable energy sources,
- fees for encouraging the production of electricity from renewable energy sources.

The RES operator, with the approval of the Regulatory Commission for Energy of Republika Srpska, issues instructions on the operation of the balance group of renewable energy sources.

In **Georgia**, all electricity producers will be obliged to be the balance responsible parties or the member of balancing group when the new electricity market launches, i.e. they will be financially responsible for their imbalances in the organized electricity markets. However, WPSO will be balance responsible party and will bear the imbalance costs for the RES power plants operating under PPAs.

In **Kosovo\***, according to the Article 11 of the *Rules on the support scheme*, the RES producers with an installed capacity of more than 500 kW awarded a feed-in tariff are balance responsible for 25% of their imbalances, while the rest – 75% are covered through end user's tariffs. The RES producers with an installed capacity of more than 500 kW out of the feed-in tariff scheme are balance responsible for 100% of their imbalances.

In 2021, the annual share of RES balancing costs in overall balancing costs in the country was about 0.5%.

Generally speaking, producers from renewable energy sources in **Montenegro** are balance responsible except those that are granted the privileged producer status. The Market Operator (COTEE) is the balance responsible for all privileged producers.

The total costs of balancing in Montenegro in 2021 was 14,207,075 EUR. Balancing cost RES belonging to the Privileged producers group was 4.361.223 EUR which is 30.7 % of overall balancing costs.

It is foreseen that the new RES Law (in the drafting phase) will introduce balance responsibility for all future RES producers.

Producers from renewable energy sources, including the ones entitled to premium that participate directly in the market, in **North Macedonia** are balance responsible parties. Only preferential producers that are entitled to the feed-in tariffs are excluded and for them balance responsible party is the market operator.

Off-taker takes balance responsibility for the producers that use premiums. The off-taker does not invoice costs for the imbalances to the producer that uses premium if the imbalances are not more than 15 % on the hourly level. In any other cases off-taker invoices for the imbalance costs.

The cost for balancing can be shown only for the producers that use feed-in tariffs through the market operator, or in other words, it can be seen through imbalances of the market operator. From the data for 2021, the negative imbalances of the market operator were at the level of 252.034.056 MKD (around 4.1 million Euros) which is 4,4% of the total negative imbalances. The positive imbalances were on the level of 263.056.029 MKD (4.3 million Euros) which is 14,4% of the total positive imbalances.

In **Serbia**, based on the provisions of the RES Law from 2021, the RES with incentives (market premium or feed-in tariff) will become balance responsible parties when certain preconditions are met. The main precondition is the establishment of a liquid organized intraday market.

Currently, those RES with incentives (market premium or feed-in tariff) are in the balance group of the public supplier. The share of balancing costs of RES in total balancing costs was 5.2% in 2021. All other RES producers (not entitled to incentives like market premium or feed-in tariff) are fully balance responsible.

Pursuant to the Law of **Ukraine** on the Electricity Market, electricity producers entitled to a "green" tariff belong to the single balancing group on the basis of a bilateral contract with a guaranteed buyer. Unlike other balancing groups, the rules of operation of the balancing group of producers under the "green" tariff are determined by the NEURC. The guaranteed buyer bears financial responsibility to the TSO for the electricity imbalances of the electricity producers that are under the support scheme ('green' tariff or auction price), that are part of its balancing group.

However, in accordance with the final and transitional provisions of the above-mentioned Law, the share of compensation to the guaranteed buyer by economic entities with an installed capacity of up to 1 MW that are entitled to 'green' or auction price and are part of guaranteed buyer balancing group, is:

- until December 31, 2020 - 0 percent;
- from January 1, 2021 - 10 percent;
- from January 1, 2022 - 20 percent;
- from January 1, 2023 - 30 percent;
- from January 1, 2024 - 40 percent;



- from January 1, 2025 - 50 percent;
- from January 1, 2026 - 60 percent;
- from January 1, 2027 - 70 percent;
- from January 1, 2028 - 80 percent;
- from January 1, 2029 - 90 percent;
- from January 1, 2030 - 100 percent.

The share of compensation to the guaranteed buyer by economic entities with an installed capacity of more than 1 MW that are awarded a 'green' or auction price and are part of the guaranteed buyer balancing group, is:

- until December 31, 2020 - 0 percent;
- from January 1, 2021 - 50 percent;
- from January 1, 2022 - 100 percent.

Until 31<sup>st</sup> of December 2029, a business entity that produces electricity at electricity facilities using wind energy and is part of the balancing group of the guaranteed buyer shall reimburse the value of its imbalance to the guaranteed buyer (as presented above) only in the event of a deviation in the actual hourly volumes of such electricity supply of the economic entity from its hourly electricity supply schedule by more than 10%.

Until 31<sup>st</sup> of December 2029, a business entity that produces electricity at electric power facilities that use solar radiation and is part of the balancing group of the guaranteed buyer will reimburse the value of its imbalance to the guaranteed buyer (as presented above) only in the event of a deviation in the actual hourly volumes of electricity supply of such a business entity from its hourly electricity release schedule by more than 5 percent.

The total balancing costs borne by the guaranteed buyer were 57,691,300.9 EUR in 2021 (taking into account the amount of funds paid by the OSP trade to the guaranteed buyer for the provision of balancing services in the amount of 29,651,195 EUR). Since the total balancing costs in the Balancing market were 428,247,749.38 EUR in 2021, the share of RES costs in overall balancing cost was 13%.

In **Armenia**, small HPPs with the installed capacity of up to 30 MW and other electricity producers using renewable energy sources, whose purchase guarantee has not expired, are members of the balancing group created by Universal (Guaranteed) supplier and have a status of BRPP. BRPP status means that the wholesale electricity market (WEM) participant has joined to the other participant's balancing group by authorizing the latter to trade electricity in the WEM on its behalf, to undertake balancing responsibility and pay for services. According to PPA<sup>10</sup> signed between these producers and Universal (Guaranteed) supplier, the producer with the installed capacity of less than 30MW is obliged to ensure the delivery of electricity to the distribution network of at least 70 percent of the annual quantity provided for in Annex No. 6 of the agreement. In the event that the producer fails to deliver mentioned quantity, the Universal (Guaranteed)

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<sup>10</sup> Exemplary form for the plants with the installed capacity of less than 30MW is approved by the PSRC Resolution №456-N of December 12, 2018, while for the plants with the installed capacity of more than 30MW it is approved by the PSRC Resolution №543-N of December 13, 2017.

supplier has the right to demand from the producer to pay the penalty for each kWh of not delivered electric energy (compared to the requirement from the agreement). This penalty is calculated by multiplying each kWh of not delivered electric energy with the difference between Balance Service Provider's maximum tariff for current tariff year and producer's current tariff, if producer's current tariff is lower than the Balance Service provider's maximum tariff. On the other hand, according PPA (exemplary form approved by the PSRC Resolution №543-N of 13<sup>th</sup> of December 2017), the producer with the installed capacity of more than 30MW has to supply to the network at least 80 percent of plant designed electricity production for its first 10 years, while for the other 10 years at least 70 percent of plant designed electricity production, unless otherwise provided by the State-Private Partnership transaction. If the minimum production as prescribed in the PPA is not reached, producer is obliged to pay penalties, similar to the previously described case.

Small HPPs with the installed capacity of up to 30 MW and other electricity producers using renewable energy sources, whose purchase guarantee has expired according to Electricity law, may become a member of the balancing group with the status BRPA<sup>11</sup> or BRPP. The balance responsibility between such producers and other market participants involved in balancing group, except for the group created by Universal (Guaranteed) supplier, are not regulated. Also, these power plants may become an independent balance responsible parties or assume the responsibility for imbalances of other WEM participant or has formed a balancing group with limitations prescribe by WEM Trading rules.

## 6. Flexibility

In **Albania**, provision of the flexibility services through the participation of energy storage or aggregation has not been introduced in legislation yet.

In **Bosnia and Herzegovina's entity Republika Srpska**, storage capacity and aggregators participate in the market under the same conditions as other market participants according to the legislation or rules on corresponding activity (RES, efficient cogeneration, supply, etc.).

On the other hand, in **Bosnia and Herzegovina's entity Federation of Bosnia and Herzegovina**, the flexibility concept has not yet been introduced. The adoption of a new set of Energy Laws defining these concepts is expected soon.

However, in the first half of 2022, Independent System Operator of Bosnia and Herzegovina, with the support of all others institutions and stakeholders in the electricity market, made a temporary model that enables non-discriminatory and free access to the single electricity market in Bosnia and Herzegovina for power plants connected to the distribution network. This model enables the aggregation of producers on the distribution network under the name "virtual power plant" who can access the market through the selected balance responsible party. The condition is that the minimum installed capacity of all power plants connected to the distribution network and which are part of the virtual power plant is 1MW.

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<sup>11</sup> BRPA is the WEM participant that has joined to the other participant's balancing Group, authorizing the latter to bear its balancing responsibility only.

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The flexibility aspect is not treated in the legislation in force in **Kosovo\***. However, it is incorporated in the Energy Strategy 2017-2026, including the Draft energy strategy 2023-2031, proposed by the Ministry of Economy of Kosovo\*. Storage capacity, according to the above-mentioned strategy is approximately 200 MW of pump storage plant.

In **Montenegro**, the flexibility aspect is introduced in legislation through the participation of consumers in providing ancillary services (Replacement Reserves). The Energy Law introduced a right of self-consumers to aggregate in order to sell generation surplus in a more efficient and competitive way.

In **North Macedonia**, storages are introduced in the Amendments of the Energy Law adopted by the Parliament in November 2022. In November 2022, ERC adopted new Electricity Market Rules which further regulate a function of virtual producer as an aggregator of RES power plants connected to the distribution network and their joint participation on the wholesale electricity market and balancing market.

In **Serbia**, amendments to *Energy Law* from 2021 define the roles of storage and aggregators and recognize them as market participants, but their roles have yet to be more elaborated in legislation.

Currently, the *Law of Ukraine on Amendments to Certain Laws of Ukraine Regarding the Development of Energy Storage Installations* is implemented in accordance with Directive 2019/944 and Regulation 2019/943. The law provides for the opportunity for the consumer to participate in the electricity market, including the use of energy storage installations, in different market segments, including the balancing market and the market of ancillary services, and the aggregation of consumers for this purpose. To date, the NEURC is taking measures to amend the normative legal acts to bring them into line with the provisions of the Law.

In **Armenia**, flexibility aspect is not envisaged yet.

### III. SUMMARY

Overview of the generation mix in Contracting Parties shows a diversity of shares of different technologies among Contracting Parties, mostly due to the fact that the choice of production technology was dictated by the availability of primary resources. This is the reason why some Contracting Parties rely on, for example, coal-fired TPP and some on HPP. Ukraine is the only Contracting Party that has a significant share of nuclear power plants. The deployment of SPPs and WPPs, which are slowly penetrating this region, is also noticeable. On the other hand, in Armenia, gas-fired TPPs are the most dominant in the generation energy mix.

After amending EnC *acquis communautaire* to include Directive (EU) 2018/2001 30<sup>th</sup> of November 2021, the Directive was transposed only in Bosnia and Herzegovina's entity Republika Srpska and Serbia, and partially in Georgia.

The most commonly applied RES support scheme in Contracting Parties is the combination of feed-in tariffs and market premiums. However, several Contracting Parties have also introduced other concepts of RES support. Albania, Bosnia and Herzegovina's entity Republika Srpska, North Macedonia and Serbia have developed support schemes based on both feed-in tariffs and market premiums, whereas in most cases the market premiums are assigned to the RES producers via auctions. On the other hand, aside from the market premiums, the second type of RES support scheme in Georgia relies on support measures based on the Law on Public Private Partnership. In Kosovo\* and Montenegro, the RES support is mainly based on the feed-in tariffs, however, the further issuance of privileged producer status to new RES producers is terminated. Instead, the introduction of the auctions is planned in near future. Finally, in Ukraine, the RES power producers can be entitled to the 'green' tariff established by NEURC or the auction price. In Armenia, only the support scheme based on feed-in tariffs is applied.

In most Contracting Parties, the HEC is entitled to a support scheme that has a lot in common with the treatment of the producers from RES. However, some Contracting Parties (Albania, Kosovo\* and Ukraine) and Armenia have not defined HEC treatment in their national legislation.

Self-consumption support schemes have been introduced in all Contracting Parties. In most Contracting Parties, the maximum capacity of self-consumers is limited: Albania up to 500 kW, Kosovo\* up to 100 kW, Montenegro up to the approved capacity of the concerned consumer, North Macedonia up to 6 kW for households, while 14 kW for other consumers, Serbia up to the approved capacity of the concerned consumer, and Ukraine up to 50 kW for households, while 150 kW for other consumers. In Bosnia and Herzegovina, no limitation of the generation capacities of the self-consumers is defined. Nevertheless, the scale of uptake of self-consumption is still very modest.

In most cases, the funds for supporting RES integration are collected from the final consumers via electricity bill, either by transparently presenting the share of RES cost separately on the bill or by incorporating it into the retail tariff. However, in some Contracting Parties, part of the funds are covered by other means. The share of RES support in retail tariff varied among the Contracting Parties, but it was lower than 10% (for those Contracting Parties that provided relevant data).

When it comes to the role of NRAs in RES support schemes, competencies vary a lot. In some Contracting Parties, such as Bosnia and Herzegovina, Kosovo\* and Ukraine, the Regulatory Authority is responsible for setting support scheme and conducting support measures while in other Contracting Parties NRA have a limited role in the RES field (e.g., issuing special statuses for eligible groups of RES producers). In Armenia, the PSRC approves the methodology for calculating the tariffs for power plants using RES and Retail Electricity Market Trading Rules.

Regarding the balance responsibility of producers from renewable energy sources, some Contracting Parties have introduced the installed capacity thresholds regarding the balance responsibility of the RES producers. In Bosnia and Herzegovina, the RES producers awarded a feed-in tariff with an installed capacity of up to 150 kW are excluded from balance responsibility, while this threshold is 500 kW in Kosovo\*. On the other hand, in Montenegro, North Macedonia and Serbia (at least until a certain preconditions are met), all RES producers awarded a feed-in tariff are fully excluded from the balance responsibility. In Albania and Georgia, all RES producers are balance responsible parties. In Ukraine, the balance responsibility of the economic entities awarded a 'green' tariff or the auction price is going to be introduced gradually, while for the SPP and WPP in this is only applicable if their imbalances are 5% (SPP) or 10% (WPP) respectively. In Armenia, producers from RES whose electricity purchase guarantee has not expired according to the Energy law are members of the balancing group created by Universal (Guaranteed) supplier who undertakes their balancing responsibility. However, in case their annual production is below the prescribed minimum value, they are obliged to pay penalties.

Concerning the flexibility related to renewable energy sources, in most Contracting Parties and Armenia, the legislation has yet to be amended in order to introduce energy storage and aggregation.